

SCIENCE POLICY



Linked documents

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| Statement of Intent, Implementation and Impact | } www.grangetown.sunderland.sch.uk/Science/ |
| Curriculum Map for Science | |
| Long Term Planning | |
| Medium Term Planning | |
| Our Early Years Planning includes details of how we teach Science in Nursery and Reception (Understanding the World) | https://grangetown.sunderland.sch.uk/Curriculum/Our-EYFS-Curriculum/ |
| Our 2021-22 School Improvement Plan includes our Action Plan for Science. | https://grangetown.sunderland.sch.uk/School-Improvement-Plan/ |

1. Introduction

Science teaches children understanding of the world around them, in terms of physics, biology and chemistry. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate critical & evaluative thinking. Children learn to ask scientific questions and begin to appreciate the way that Science will affect their future on a personal, local, national, and world-wide level.

A high-quality Science education provides the foundations for understanding the world; Science has changed our lives and is vital to the world's future prosperity, and all children should be taught essential aspects of the knowledge, methods, processes and uses of Science. Through this children should be encouraged to recognize the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how Science can be used to explain what is occurring, predict how things will behave, and analyse causes.

2. Aims

Our Science Policy follows the National Curriculum for Science Guidelines and the Early Years Foundation Stage Framework. Through the teaching of Science we aim to:

- 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 the children to answer scientific questions about the world around them;
- Equip children with the scientific knowledge required to understand the uses and implications of Science, today and for the future.
- Encourage an understanding of how Science can be used to explain what is occurring, predict how things will behave, analyse causes and evaluate outcomes.
- Ensure that all children within our school have equal opportunities in Science regardless of their background, religion, race, gender, physical or intellectual ability.

3. The organisation of Science across the School

3(i) Curriculum Organisation

Grangetown Primary School delivers a broad and balanced Science education which follows a curriculum route that is built on a logical progression of knowledge, skills and vocabulary. Long-term planning is organised from the National Curriculum statutory objectives and shows the journey of knowledge and skills that children develop across a series of Science units. Medium-term planning is carefully sequenced and taught to ensure learning is progressive across the units and across each year group.

3(ii) The nature, processes and methods of Science

'Working scientifically' specifies the understanding of the nature, processes and methods of Science for each year group. It is not taught as a separate strand, but rather is embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that children learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Children should seek answers to questions through collecting, analysing and presenting and evaluating data.

3(iii) Time Allocation

Science is taught for a minimum of one hour each week. This time can be blocked if required to cover fewer but longer sessions. It will also be taught through other subjects areas like mathematics and ICT, but only where appropriate and only where this enhances learning and adds to understanding. In EYFS, Science is embedded into the continuous provision as well as standalone lessons being taught.

3(iv) Equal Opportunities

All children have equal access to the Science curriculum. Teaching and learning, and the use of resources and equipment, are differentiated appropriately, to meet the needs of all children.

3(v) Health and Safety

All teachers are responsible for safety in their own lessons. All teaching and learning follows the school's Health and Safety policy. For any external visits, or for activities in our own grounds for example, risks assessments are completed and are evaluated after the visit. Equipment is stored securely, and used in a safe way in the classroom.

4. Science in each of our Key Stages

EYFS

Science is an integral part of learning and is embedded throughout activities through Understanding the World. Cross-curricular links are also made, so that children can develop and apply their scientific skills. Understanding the World provides a powerful, meaningful context for learning across the curriculum. It supports children to make sense of their expanding world and their place within it through nurturing their wonder, curiosity, agency and exploratory drive. In order to meet these needs, children require regular and direct contact with natural and built environments, and engagement in collaborative activities which promote inquiry, problem-solving, shared decision making and scientific approaches to understanding the world. In addition, first-hand involvement in caring for wildlife and the natural world provides children with an appreciation of ecological balance, environmental care and the need to live sustainable lives.

Key Stage 1

The principal focus of Science teaching in Key Stage 1 is to enable children to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should

be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. 'Working scientifically' must always be taught through and clearly related to substantive Science content in the programme of study. Children should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2 – Years 3 and 4

The principal focus of Science teaching in lower Key Stage 2 is to enable children to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. 'Working scientifically' must always be taught through and clearly related to substantive Science content in the programme of study. Children should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

Upper Key Stage 2 – Years 5 and 6

In Upper Key Stage 2, the principal focus of Science teaching is to enable children to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer Science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Children should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. 'Working scientifically' must always be taught through and clearly related to the substantive Science content in the programme of study. Children should read, spell and pronounce scientific vocabulary correctly.

5. Aspects of Teaching and Learning

5(i) Planning

Teachers plan using a variety of teaching styles in order to provide a broad Science curriculum.

- Long term planning (Quest 1) show the National Curriculum coverage at KS1 and KS2
- Medium term planning (Quest 2) involves sequencing knowledge into small steps, to develop progression and meet the end points of the National Curriculum. Knowledge is planned across units to ensure it builds upon the previous unit and provides children with a secure understanding prior to moving on to the next unit. Skills are sequenced in each year group to ensure coverage and

development across the school year. Key vocabulary is included in medium term plans which also have been sequenced across year groups and units.

- Short term plans are the weekly plans which include a section for the objective/skills being taught, details of the activity and the success criteria. The teacher then evaluates the lesson against the success criteria, annotating the planning as appropriate (which in turn contributes to next steps in planning, teaching and learning).

5(ii) Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that children make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage.

Here at Grangetown Primary we encourage learning through investigation, with an emphasis on first-hand experience. Science lessons contain discussions of prior learning; whole class, group or individual learning; practical, investigative tasks; recording and communicating.

Children should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of Science, including collecting, presenting and analysing data.

5(iii) Assessment

Assessment informs the next steps in teaching and learning, and enables the teacher to evaluate what children know and understand. Children's understanding, knowledge and skills are assessed through observation, discussion, questioning, written work and end of unit tests (including low stakes quizzes).

5(iv) Cross Curricular Links

Where appropriate, teachers will make links to other core and foundation subjects to ensure contextual relevance. However, this does not detract from the 'teaching of Science' as an important subject within itself.

5(v) Reporting to Parents

Children's work and achievements for each school year are reported through the end of year Report. In addition, teachers meet with parents once a term through 'Parent Consultation' days where teachers can notify parents of any concerns/achievements as they see fit.

5(vi) Special Educational Needs

Provision will be made for children with special educational needs, where this affects their ability to participate and achieve in a Science lesson. The curriculum will be differentiated through the use of differing pupil groupings, adapted equipment and different levels of pupil activity. Children may need the support of a teaching assistant or 1:1 teacher support to help them access the Curriculum at times.

5(vii) Spoken Language and oracy

The National Curriculum for Science reflects the importance of spoken language in children's development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that children hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that children build secure foundations by using

discussion to probe and remedy their misconceptions. Children will be encouraged to 'talk scientifically' through the use of STEM sentences.

5(viii) Differentiation

At GPS we teach Science to all children, whatever their ability. We provide a broad and balanced education for all children. Through our Science teaching, we provide learning opportunities that enable all children to make progress. We do this by setting suitable learning challenges and responding to each child's different needs. In Science, differentiation can be by outcome, task or intervention. Strategies include:

- pupil groupings, e.g. ability or mixed ability, or group, paired or individual activities
- resources, e.g. different equipment for different levels of ability
- pupil activity: different group tasks, different roles and responsibilities, breaking work into smaller steps, different allocations of time, variations of pace within the lesson to match ability.

As well as scaffolding children to access the Science curriculum, more able children are challenged during Science lessons through skilled questioning by teachers and teaching assistants to ask children to reason, problem solve and explain.

6. The Role of the Science Coordinator

6(i) Overview

The Science co-coordinator is responsible for the monitoring and implementation of the Science Curriculum, and the management of Science resources, as follows:

- Take a lead in policy development and the production of a scheme of work designed to ensure progression and continuity throughout the school
- Monitor progress in Science and advise the Head teacher on any action needed [see (ii) below]
- Support colleagues in their development of detailed work plans and the implementation of the scheme of work and in assessment and record keeping activities
- Take responsibility for the purchase and organisation of resources
- Keep up to date with developments in Science and disseminate this information to colleagues.

6(ii) Monitoring

Monitoring of the taught curriculum is achieved through scrutiny of planning and through discussion in staff meetings and Key Stage meetings. For all subjects, the Coordinator is allocated regular non-contact time, some of which will be employed in observing teaching and learning and meeting with children to discuss Science. The Coordinator and Head teacher monitor progress towards SIP targets. A short termly written account of progress is produced by the Coordinator. The Head teacher reports to the Governors Teaching and Learning Committee, as appropriate.

6(iii) Organisation of resources and dissemination of information

Each class teacher has resources stored in their classroom, and further resources and equipment are stored centrally. If staff need resources, the Science subject lead will order and hand out the resource. The Science subject leader will pass on to staff any further information as it becomes available and will attend any future training courses for this subject, disseminating information as appropriate.

Catherine Tose
Science Co-ordinator
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