Policy for the Teaching and Learning of Science

Policy review dates and changes

Review Date	By Whom	Summary of Changes	Date implemented
June 2015	R.Reece	Latest DfE guidance	September 2015
May 2018	J.Flint	Updated in line with latest DfE guidance and expectations	June 2018
April 2020	J.Flint	Updated in line with new OFSTED Framework, highlighting the 3 Is.	

Introduction

We live in an increasingly scientific and technological age where children need to acquire the knowledge, skills and attitudes to prepare them for life in the 21st century.

At Griffe Field Primary School, we aim to develop curiosity, enjoyment, respect for the environment and a growing understanding of science knowledge, through an approach in which pupils raise questions and investigate the world in which they live.

Key Roles

Throughout this policy document, key roles will be referred to. These are delegated as below.

Headteacher	Emma Mitchell
Science Subject Leader	Jack Flint
Teachers	All other teaching staff at GFPS

The Science Subject Leader - Roles and Responsibilities

The role of the science subject leader is to:

- *Monitor and review the effectiveness of the Science Curriculum (referred to later in this policy document).*
- *Be responsible for the development of the Science Curriculum, including designing, implementing and reviewing action plans. (referred to later in this policy document)*
- *Support teachers in their planning and strategies for classroom management.*
- *Disseminate new information.*
- *Provide or organise staff training.*
- *Be responsible for providing appropriate science resources.*
- *Liaise with other science leaders at network meetings, moderation seminars or external training events.*
- *Liaise with external science/engineering organisations and STEM providers to provide enrichment opportunities i.e. Rolls Royce*
- *Liaise with the secondary school regarding continuity.*

Our Intent

Aims and Objectives

Early Years Foundation Stage

In the Early Years, the Science subject area is covered through multiple aspects of the Early Years Curriculum. The Specific Learning Area 'Understanding the World' contains the Early Learning Goal 'The World', which includes the majority of scientific learning objectives. Other ELGs, such as 'Speaking', 'Understanding' and 'Exploring and Using Media and Materials' as well as the 'Characteristics of Effective Learning' also provide children with pre-requisite enquiry skills and knowledge needed to support the future learning of Science.

Throughout the Foundation Stage, both in Nursery and Reception, the Early Years Foundation Stage Profile (EYFSP) and the Development Matters guidance document outline the following aims to support the development of scientific knowledge and understanding:

- To provide first-hand experiences that encourage exploration, experimentation, observation, problem solving, prediction, critical thinking, decision making and discussion.
- To teach skills and knowledge in the context of practical activities for example, learning about the characteristics of materials by freezing and melting water.
- To provide a range of experiences using malleable resources following Derby City Guidelines.
- To encourage children to tell each other what they have found out, to speculate on future findings or to describe their experiences, thus enabling them to rehearse and reflect upon their knowledge and practise new vocabulary.
- To use correct terminology e.g. pupae when studying life-cycles.
- To use carefully framed open-ended questions such as, "how can we…?" or "what would happen if…?"

Primary Curriculum

The Primary National Curriculum for Science outlines a number of aims and outcomes for children. This includes specific subject knowledge content for each year group, as well as many key skills and strategies for children to develop a love of the sciences. The teaching of science at Griffe Field Primary School aims to:

- Provide appropriate and stimulating scientific experiences, which encourage pupils to make sense of the world around them.
- Develop a positive attitude to scientific enquiry
- Develop an awareness of the influence of science in everyday life.
- Deliver activities that meet the requirements of the National Curriculum in a way that is appropriate to the needs and interests of all pupils and which challenge them to fulfil their potential.

- *Teach scientific enquiry through practical work in order to develop skills of observation, prediction, investigation, interpretation, communication, questioning and hypothesizing.*
- *Teach the different types of scientific inquiry skills which should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources*
- *Encourage children to collect relevant evidence and to question outcomes.*
- *Enable children to appreciate that we do not always know the answers and results when carrying out scientific enquiry.*
- *Enable children to develop their skills of co-operation through working with others and working independently on scientific tasks.*
- *Develop an understanding of personal and group safety by the correct usage and storage of resources.*
- *Develop a caring attitude towards the environment, living things and to encourage appreciation for the world we live in.*
- *Use scientific contexts to develop and consolidate the basic cross-curricular skills in literacy, numeracy and the role of ICT.*

Our Implementation

Teaching and Learning

National Curriculum Content

The Primary National Curriculum for Science outlines the subject content for Key Stages One and Two. This is divided into two areas; 'Programmes of Study' and 'Working Scientifically'. The 'Programmes of Study' outline different topic areas and specific knowledge and conceptual understanding to be taught to each year group. The 'Working Scientifically' area outlines skills to be developed over a two year period (Years 1 and 2, Years 3 and 4 and Years 5 and 6).

To see the Primary Science Curriculum, please follow the link below:

https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study

At Griffe Field, teachers use the outlined Programmes of Study to define the key learning objectives for their year group. Teachers also adapt subject content where necessary to meet the varying needs of the children, to support or extend learning to provide a relevant and challenging science curriculum. This is all to fit with the wider year group curriculum.

Delivering the Curriculum

Pupils at Griffe Field will be provided with a range of learning experiences, both within the classroom and in the outside school environment. These first hand experiences are invaluable and allow the children to take part in:

- Exploratory play to gain experience of a situation, material or object and to develop their own ideas around it
- Experimentation to try out ideas and find out what happens
- Investigation to test ideas or hypotheses in an increasingly systematic way
- Focused observation to develop the ability to notice detail and changes that take place over time
- Focused practical tasks to promote understanding of a concept or skill
- Sorting and classifying to group things by observable characteristics
- Discussion and debate of ideas and conclusions to consolidate understanding and develop the ability to explain clearly
- Presenting the results of their work in appropriate and varied ways
- Gaining respect for evidence and appreciating the views of others
- Working collaboratively and independently
- Using secondary sources to widen experiences
- Use wider contexts than those possible in the classroom and immediate environment
- Use of specialised technology e.g. data loggers, digital microscopes, videos and the Internet

Health and Safety

A common sense approach to health and safety is used during the teaching of Science at Griffe Field. All reasonable steps are taken to ensure the safety of children, specifically during scientific experiments. For any 'adventurous' activities, including but not limited to fire lighting, cooking etc, a risk assessment must be completed and shared with all adults involved in the learning, as well as with the Headteacher and also explained to the children in understandable terms.

In order to stay safe when teaching Science in school, all staff are aware of the guidance outlined by CLEAPSS. This can be found by following the link.

http://science.cleapss.org.uk/

Where appropriate, reminders will be given to children about potential hazards and care of the equipment they are using. If required, additional risk assessments are carried out. Any trips are planned based on the guidance outlined in the school policy on taking children on outings.

Inclusion

Equal Opportunities

At Griffe Field Primary School, we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or socio-economic status.

In school, we aim to meet the needs of all our children by differentiation in our science planning. We also provide a variety of approaches and tasks appropriate to differing ability levels. This will enable children with learning and/or physical difficulties to take an active part in scientific learning, practical activities and investigations, in order to achieve the goals they have been set.

Special Educational Needs and Disability (SEND) and Additional Learning Needs

In order to meet the needs of those children identified as having SEND, close attention shall be paid to the targets outlined on either their PLP or EHCP. Children who are also considered 'Wave Two' on the GFPS Graduated Response (see SEND Policy) will also be taken into consideration during the teaching of Science. All children will be given the necessary support to access the curriculum and allow them to carry out tasks at their own level.

Gifted and Talented

Provision will be made when necessary, for pupils to extend their experiences beyond that of the majority of the class by one of the following:

- reducing the level of support provided and thereby increasing the need for independent thinking
- increasing the level of knowledge to be gained and communicated

- applying knowledge to an unfamiliar context
- setting more challenging criteria for investigating or presenting information

Wider Opportunities

In order to provide wider learning experiences for children, other learning opportunities where possible should be accessible. The aim of this is to provide extra enrichment to their learning and allow children to develop further in their learning outside of their timetabled lessons.

This can be delivered to children in a variety of ways, including:

- Theme days or theme weeks within schools
- Outside providers delivering clubs, workshops and/or assemblies in school (including STEM providers)
- School trips
- After school or lunchtime clubs
- Access to regional or national competitions

It is the responsibility of the Science Subject Leader to organise these opportunities, liaising with school staff, SLT, STEM providers and other outside organisations.

If these extracurricular activities are provided, the Science Subject Leader is to ensure that a wide range of children are given the chance to attend, including children with SEND, G&T, FSM, Forever 6, or those considered to be vulnerable in some way. This is to ensure that a range of children have access to these opportunities, promoting equal opportunities, as stated above.

The Impact

Assessment

Formative Assessment

Assessment for learning is continuous throughout the planning, teaching and learning cycle. This is carried out in a number of ways, including:

- Observing children at work; individually, in pairs, in groups or whole class
- Questioning, talking and listening to children.
- Considering work, materials and investigations produced by children together with discussion about this with them.
- Gathering evidence from children's work, either from written evidence in science books, photographic evidence collected whilst children or working or recordings/notes of children's discussions.
- Reflecting on lesson plans, whether children have reached the intended outcomes for the session(s).
- Adapting questioning/teaching to provide support or challenge to meet the needs of the children.

Summative Assessment

At the end of each unit of Science teaching, the class teacher is to prepare and complete a 'Record of Achievement' sheet. This outlines the key objectives for that particular unit of learning. Class teachers then note which children are exceeding these objectives, as well as those who are still working below this standard. This is analysed by the Science Leader and the Headteacher and used to report on achievement and progress.

In addition to this, class teachers also complete their CAP (Celebrating Achievement and Progress) Files. This includes assessment information for all 'core' subjects on a set of identified pupils which is representative of their class cohort. For Science, three children are monitored (one average learner, one above average learner and one below average learner).

Children's level of ability is also monitored during the school assessment weeks, using the school system for assessing progress towards age related expectations (ARE). This is done three times a year (once for baseline, one at mid-year and then at the end of the year) and identifies on a scale of one to six whether children are emerging, at expected or exceeding ARE.

As summative testing for Science is an area that is being explored nationally, Griffe Field are currently trialing the use of Rising Stars assessment tests. These are to be used as a tool to support the teacher assessment outlined above, as well as a form of pre-learning task when completed for Baseline assessment week.

These assessments are to be used three times a year as outlined earlier to review children's current knowledge and attainment for their current year groups subject knowledge objectives.

The Rising Stars assessments are being trialed at this time and it is under review as to whether we continue to use them in the future.

Monitoring, Evaluation and Review of the Science Curriculum

Subject Leader Monitoring Time

Ensuring the effectiveness of the Science Curriculum at Griffe Field is a key part of the Subject Leader's role.

Monitoring can be carried out in multiple ways, including:

- Learning walks, both formal and informal.
- Questionnaires to staff and pupils.
- Pupil Voice
- Looking at evidence of pupils work, including in books, photographs, videos, displays etc…
- Analysis of assessments, including ROAs, test scores, teacher assessments, CAP files etc.

Developing the Curriculum

The Subject Leader is to use evidence from these monitoring activities to evaluate the impact of the curriculum. From this, the Subject Leader is to develop an action plan which highlights the key developments and intentions to carry out over the next academic year. Furthermore, the Subject Leader can complete a Subject Self Evaluation Review Tool to identify strengths and weaknesses of the subject to feed into the action plan. This action plan is then shared with SLT and depending on the needs of the school as a whole, added and developed in the School Improvement Plan.