Grangefield School
Flying high. Spreading our wings.

Curriculum Overview for Science 2022 - 2023

Intent

"Science is the language of curiosity" – Professor Brian Cox

Science is a vital and ever present aspect of our daily lives and we, at Grangefield, believe that learning about Science requires the acquisition of knowledge, concepts, vocabulary, skills, resilience and positive attitudes. The teaching and learning of Science, therefore, is underpinned by our school drivers (Solid Foundations, Global Child, Good to be Me and Growth Mindset) and primarily focuses on increasing the children's knowledge and understanding of the diverse world around them in order to foster a love for Science and to develop respect both for all living things (however large or small) and the wider physical environment. Using an enquiry based approach; using "Big Questions" and "Big Ideas"; we encourage our children to develop a life-long curiosity about the world. Children are involved in asking the questions and are taught the practical skills to enable them to discover, for themselves, the answers to those questions, using a wide range of scientific enquiry methods. We have a broad progressive curriculum which is taught through practical learning opportunities. Where practicable, cross curricular learning opportunities are implemented to place Science in the context of our children's wider learning. Our key aim is for our children to be able to fully engage with the world, be lifelong learners and be aware of the opportunities for future prosperity, through the promotion of STEM careers. Grangefield's commitment to inclusion and the development of resilience and a growth mind-set means that all learners are challenged and supported, wherever they are on their learning journey.

Using the framework provided by the National Curriculum the intent of our Science curriculum is to ensure that by the end of Key Stage 2, children:

- 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
- are 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
- build up an extended specialist vocabulary which they are able to use correctly, verbally and in writing

This journey, of course, begins in EYFS, where Science primarily comes under the Understanding the World area of learning with the following aims;

ELG: The Natural World where children will:

- explore the natural world around them, making observations and drawing pictures of animals and plants;
- know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
- understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

In addition, Science plays an important part by offering opportunities for other Early Learning Goals for example:

- listening attentively and responding to what they hear with relevant questions,
- making comments about what they have heard and ask questions to clarify their understanding;
- holding conversations with their teacher and peers.
- participating in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary;
- offering explanations for why things might happen, making use of recently introduced vocabulary
- expressing their ideas and feelings about their experiences using full sentences
- setting and working towards simple goals,
- being confident to try new activities and show independence, resilience and perseverance in the face of challenge

The skills and knowledge acquired in EYFS are built upon in Key Stage 1 where the principal focus of science teaching is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them with the emphasis on working scientifically and:

- being curious and asking questions about what they notice
- developing their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions
- using 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.
- using appropriate secondary sources, such as books, photographs and videos.

As the children progress to lower key stage 2, they will begin to use their knowledge, expanding further their scientific skills and vocabulary. The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them with the emphasis on working scientifically and:

- exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments
- beginning to develop their ideas about functions, relationships and interactions
- asking 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
- finding things out using secondary sources of information
- drawing simple conclusions
- using scientific language, first, to talk about and, later, to write about what they have found out.

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas with the emphasis on working scientifically and:

- exploring and talking about their ideas

- asking their own questions about scientific phenomena
- analysing functions, relationships and interactions more systematically.
- encountering more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates
- beginning to recognise that scientific ideas change and develop over time
- selecting the most appropriate ways to answer science questions using different types of scientific enquiry
- finding things out using a wide range of secondary sources of information
- drawing conclusions based on their data and observations
- using evidence to justify their ideas, and using their scientific knowledge and understanding to explain their findings.

Implementation

From September 2022, we are beginning to develop a mastery approach to Science teaching in order to complement our approach to Maths and English teaching. Science is taught throughout the school on a weekly basis, with teachers planning from the progression document, with a focus on using scientific vocabulary and developing the children's explanatory skills. In addition, weekly science fluency sessions are held to embed prior learning and keep up sessions (either pre or post teach) are held where required.
In KS2 each year group has five topics per year to cover , which leaves a sixth term where teachers (and children) can reflect on their learning, address any lingering misconceptions and further develop scientific enquiry skills. Across all year groups, cross curricular links – particularly with English and Maths – are exploited. To ensure a full coverage Science lessons are taught discretely although links to a year group's overarching topic will be explicitly made.

Topics are taught as follows:

	Autumn	***Spring***	***Summer***
EYFS	Changes in the natural world Changes in living things Properties of materials Living things and their habitats Animals including humans		

KS1	***Year 1***			
	Seasonal changes			
	Animals including humans	Plants	Everyday materials	
	Year 2			
	Seasonal changes			
	Animals including humans	Living things and their habitats	Uses of everyday materials	Plants

LKS2	***Year 3***					
	Forces including magnetism	Animals including humans	Rocks	Light	Plants	Working scientifically
	Year 4					
	Animals including humans	Electricity	Properties of materials	Living things and their habitats	Sound	Working scientifically

UKS2	***Year 5***					
	Properties and changes of materials	Forces	Living things and their habitats		Earth, Sun and Moon	Animals including humans
	Year 6					
	Electricity	Light	Animals including humans	Evolution and inheritance	Living things and their habitats	Consolidation /transition

To further increase our children's science capital, we have an annual Science Week which where practicable coincides with the Cheltenham Science Festival. This is a week where Science becomes the main focus around the school with English and Maths lessons being firmly and explicitly linked to Science. This cross-curricular approach enables teachers and pupils to explore areas of the curriculum more deeply or even to explore scientific enquiry skills on areas of Science knowledge which are outside the scope of the normal curriculum. Each year there is a whole school investigation based around a simple question and classes then present their discoveries at our Science Fair. This is a fabulous opportunity for the children to showcase their learning to their peers, parents and carers. Science Week is always popular with the children (and staff) – especially when it involves hatching chicks!

We also take two year groups to workshops or talks at the Cheltenham Science Festival – we aim for everyone to experience this at least once in their school career.

Since September 2021 we have been working with Cleeve Secondary School and other local primary schools in a partnership with the Ogden Trust to further widen the children's experiences in Science through school visits, workshops and activities.

The school governors also play an active role in supporting the teaching of Science.

Impact

The impact of our Science curriculum is assessed using regular assessment opportunities (both formative and summative) together with student and teacher voice. The aim is for children to understand the relevance of what they are learning within Science and to enjoy their Science experiences within school.

- children will be reflective learners of Science
- children will achieve age related expectations in Science and will retain knowledge that is pertinent to future learning.

- children will be keen to participate in wider Science activities.
- children will develop an appreciation and understanding of Science which they can carry with them throughout their lives
- children will see the relevance of Science to their future academic and career aspirations.

Summer Main Assessment: 2021 2022

	% not meeting AREs	% meeting AREs
Y1A	7	83*
Y1B	13	87
Y2A	11	89
Y2B	10	90
Y3A	24	76
Y3B	3	97
Y4A	10	90
Y4B	0	100
Y5A	4	96
Y5B	8	92
Y6A	0	100
Y6B	0	100

* NB data missing for 3 children in Y1A hence totals do not add up to 100%