

# Science Curriculum



## Curriculum Vision and Rationale

Our Key Thresholds Concepts are Biology, Chemistry, Physics and Working Scientifically. These areas aim to cover Science comprehensively at primary level and equip our children with the knowledge and skills they need to be successful. The way the Key Threshold Concepts are taught allows children to embed and build their knowledge over time. We strive to give every child a broad and balanced Science curriculum which enables them to confidently explore and discover what is around them, so that they have a deeper understanding of the world we live in. We want our children to love Science. We want them to have no limits to what their ambitions are and grow up wanting to be astronauts, forensic scientists or microbiologists. We want our children to remember their Science lessons in our school, to cherish these memories and embrace the scientific opportunities they are presented with! To achieve this, it involves exciting, practical, hands-on experiences that encourage curiosity and questioning. Our aim is that these stimulating and challenging experiences help every child secure and extend their scientific knowledge and vocabulary, as well as promoting a love and thirst for learning.

## Intent

At Kingsthorpe Grove Primary School, we have a coherently planned and sequenced curriculum which has been carefully designed and developed with the need of every child at the centre of what we do.

The national curriculum for Science aims to ensure that all pupils:

- 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.

We want to equip our children with not only the minimum statutory requirements of the Science National Curriculum but to give them opportunities to develop, learn and explore scientific concepts that they would not necessarily have access to in their daily lives.

We also want to do the best we can to prepare them for the opportunities, responsibilities and experiences in later life.

Our school drivers are: Communication, Aspiration and Respect.

Communication – Each new unit will start with a 'big question'. This will spark discussion around what children already know, what they want to find out and their previous experiences linked to the unit. This will also allow teachers to understand children's prior knowledge. In Science lessons, practical group work is essential to develop children's skills in verbal communication. A range of written tasks will ensure that written communication in Science is purposeful and includes key vocabulary.

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**Respect** – We have found a diverse range of scientists and notable people that link to each Science. We have ensured that those from the LGBTQ+ community, Black and Minority Ethnic backgrounds and women are more equally represented so that the children can see themselves in successful people in Science. These are explored throughout each unit.

**Aspiration** – We know that representation is important and some of the scientists the children will learn about will promote aspiration for minority groups in STEM. We need to begin to celebrate the diverse people and careers in Science. Women only make up 28% of the workforce in STEM fields and we know that gender stereotypes, lack of role models and the 'confidence gap' contribute to this. It is our aim to inspire the children of Kingsthorpe Grove Primary School with confidence and enthusiasm so that they have a desire to further their scientific education and an ambition to work in a scientific field.

## **Implementation**

At Kingsthorpe Grove Primary School, Science topics are taught within each year group in accordance with the National Curriculum. Topics are taught in blocks to allow children to focus on developing their knowledge and skills, studying each topic in depth. Every year group will revisit and build upon the learning from prior year groups, therefore developing depth of understanding and progression of skills. Our teachers promote enjoyment and foster interest of the scientific disciplines: Biology, Chemistry and Physics. Children explore, question, predict, plan, carry out investigations and observations as well as conclude their findings. Children present their findings and learning using Science specific language, observations and diagrams. In order to support children in their ability to 'know more and remember more', we use metacognitive strategies and provide regular opportunities to review the learning taken place in previous topics as well as previous lessons. At the start of each topic children will review previous learning and will have the opportunity to share what they already know about a current topic, using their retrieval skills. Children are given key vocabulary at the start of each topic to support children with their acquisition of knowledge and are used as a reference document. Effective use of education visits and visitors are planned, to enrich and enhance the pupil's learning experiences within the Science curriculum. Teachers use highly effective assessment for learning in each lesson to ensure misconceptions are highlighted and addressed. Effective modelling by teachers ensures that children are able to achieve their learning intention, with misconceptions addressed within it. Through using a range of assessment tools, adaptive teaching is facilitated by teachers, to ensure that each pupil can access the Science curriculum. Children are given clear success criteria in order to achieve the learning intention with differing elements of independence. Pupils are regularly given the opportunity for self or peer assessment, which will then be used to inform planning, preparation, differentiation and address misconceptions within that lesson, or for the next lesson. Cross-curricular links are planned for, with other subjects such as Maths, English and Computing.

## **Impact**

The impact of this curriculum design will lead to outstanding progress over time, across key stages, relative to a child's individual starting point and their progression of skills. Children will therefore be expected to leave Kingsthorpe Grove Primary School reaching at least age-related expectations for Science. Through various workshops, trips and interactions with experts, our Science curriculum will lead pupils to be enthusiastic Science learners who understand that Science has changed our lives and that it is vital to the world's future prosperity. We want to empower our children so they understand they have the capability to change the world. This is

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evidenced in a range of ways, including pupil voice, their work and their overwhelming enjoyment for Science. The successful approach to the teaching of Science at Kingsthorpe Grove Primary School involves regularly teaching about and referring to our milestones, which will result in a fun, engaging, high quality Science education that provides children with the foundations for understanding the world that they can take with them once they complete their primary education. We also want them as adults to be aware of how Science could impact their lives. We want them to be equipped with information about environmental issues, space and generally the world around them.

Children at Kingsthorpe Grove Primary School will:

- Demonstrate a love of Science work and an interest in further study and work in this field.
- Retain knowledge that is pertinent to Science with a real-life context.
- Be able to question ideas and reflect on knowledge.
- Be able to articulate their understanding of scientific concepts and be able to reason scientifically using rich language linked to Science.
- Demonstrate a high level of mathematical skills through their work, organising, recording and interpreting results.
- Work collaboratively and practically to investigate and experiment.

## EYFS

The Early Years Foundation Stage Curriculum supports children's understanding of Science through the planning and teaching of 'Understanding the World.' Children find out about objects, materials and living things using all of their senses looking at similarities, differences, patterns and change. Both the environment and skilled practitioners foster curiosity and encourage explorative play. Children are motivated to ask questions about why things happen and how things work. Our children are encouraged to use their natural environment around them to explore. Children enjoy spending time outdoors exploring mini-beasts and their habitats, observing the changing seasons, plants and animals. Children regularly participate in cookery and baking sessions which allows them to experience changes in state as ingredients are mixed, heated and cooled.

## Long Term Curriculum Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Materials	Plants	Natural Materials	Outdoor Learning (Forest School)	Environments	Seasons
Year 1	Plants	Working Scientifically Skills	Our bodies (Humans) Senses	Everyday materials	Seasonal changes	Animals

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Year 2	Animals, including humans	Working Scientifically in animals, including humans	Uses of everyday materials	Plants	Living things and their habitats	Seasonal changes
Year 3	Forces and Magnets	Rocks	Light	Working Scientifically in light	Plants	Animals, including humans
Year 4	Working Scientifically Skills	Electricity	Changing state	Animals, including humans	Sound	Working Scientifically Skills
Year 5	Forces	Earth and space	Animals, including humans	Living things and their habitats	Properties and changes of materials	Properties and changes of materials
Year 6	Light	Living things and their habitats Animals, including humans	Electricity	Working Scientifically Skills	Working Scientifically Skills	Animals, including humans Evolution and inheritance