

# King's Hill Primary School



## Science Policy 2022 – 2023

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## **1. Curriculum Statement**

### **Intent**

#### **Early Learning Goal: Understanding the World – The Natural World**

- 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.
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The National Curriculum 2014 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

All pupils should be taught essential aspects of the knowledge, methods, processes and uses of Science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. Pupils should be encouraged to understand how Science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils 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. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Pupils 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. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school

curriculum: teachers use different contexts to maximise their pupils' engagement with and motivation to study science.

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. 'Working scientifically' should be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils 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. Pupils should seek answers to questions through collecting, analysing and presenting data.

When teaching Science at King's Hill we intend to provide a curriculum, which caters for the needs of all individuals and equips pupils with the necessary skills and knowledge for them to become successful both in school and in their future working lives.

### **Implementation**

At King's Hill, Science is taught from Early Years up to Year Six at. Pupils begin their formal science education in the early years foundation stage (EYFS). This involves learning foundational knowledge primarily through the 'understanding the world: the natural world' area of learning. Understanding the world involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment. This provides a number of rich contexts for pupils to learn a wide range of vocabulary. These words form the beginnings of scientific concepts that will be developed in Year 1 and beyond. Pupils develop their scientific and non-scientific vocabulary during this time.

In Key Stages 1 and 2, Science is taught as a stand-alone subject or incorporated into the wider curriculum areas, as appropriate. Science is taught as units of work, across the three Scientific subjects; Biology, Chemistry and Physics. Science is timetabled for one afternoon per week across each year group. Greater emphasis is placed on developing how to work scientifically, and using visual learning aids such as videos and photographs to engage pupils, and cater for all learning styles.

Pupils are taught through a progressive scheme of work called 'Snap Science'. The aim of Snap Science is for every child to engage with a coherent progression of the scientific skills and concepts specified in the National Curriculum. This scheme has been in place for a number of years at King's Hill, and staff regularly meet to discuss the suitability and effectiveness of this scheme. All lessons planned cover National Curriculum objectives and Snap Science updates their site regularly, maintaining a high quality coverage of each area of Science. Snap Science provides teachers with systematic guidance on how to use questioning to deepen understanding and scientific working practices to become more enabled to think critically and make independent decisions.

Cultural capital is the accumulation of knowledge, behaviours and skills that a pupil can draw upon and which demonstrates their cultural awareness, knowledge and competence. It is one of the key components a pupil will draw upon to be successful in society, at secondary school and further education and eventually their career and the world of work. All Science subjects are rich in encouraging cultural capital. Science regularly provides opportunities to develop wider curriculum subjects such as Maths, English, PE, Geography, Art and D&T.

At Kings Hill we enhance pupil's experiences and learning by utilising different opportunities in our Science curriculum and around the school within our wider community. Whilst teaching the National Curriculum, we are committed to providing quality-learning experiences to develop their skills in this curriculum area to prepare them for the real world. Areas in school have been developed specifically with a view to promoting science and geography skills. The Outdoor Garden area has had new planters and each class has the opportunity to plant each year, in collaboration with our 'Food for Life' award. Our Outdoor Learning spaces are continually being developed, to give each class the opportunity to explore the outdoors for themselves. Pond dipping, habitats, wildlife, flowers and plants are all elements of science being developed through providing these quality on-site resources.

### **Impact**

Teaching staff reinforce an expectation that all pupils are capable of achieving high standards in Science. Teachers follow the Snap Science scheme of work to teach Science across all year groups. Science lessons are being delivered using a range of resources, including power point presentations, questioning, videos, demonstration of practical skills and experiments. In addition, teachers' differentiation of activities from Snap Science resources is evident and purposeful to ensure all pupils at King's Hill can access the Science curriculum. As a result, evidence in Science books and pupil voice demonstrates a high level of taught subject knowledge from staff to ensure pupils remember what they have learnt. Furthermore, upper Key Stage 2 pupils are able to understand how to transfer the skills taught in the subject into their everyday lives, and gives them the opportunities to develop these interests in their next stage of learning and beyond.

At King's Hill, teachers make clear links between Science curriculum and the wider curriculum; Geography, Maths, PE, D&T, ensuring pupils have access to a broad and balance curriculum. Furthermore, pupils are able to engage in further opportunities to learn skills in Science by participating in British Science Week. Parental engagement and participation has increased through British Science Week activities. The outdoor learning environment at King's Hill is utilised to aid the development of Science teaching and learning.

## **2. Teaching and Learning**

At King's Hill, a typical Science lesson will last approximately 1 hour. From Year One to Year Six, Science is taught once a week. The Science lesson follows the format as below:

- Teachers will share a refined and children-friendly learning objective with pupils.

- **Explore** activity is used to excite children’s curiosity about a scientific phenomenon and provide a focus for pupils’ questions and investigations. It enables pupils to think and work scientifically. The Explore activity acts as a formative assessment opportunity for children to reflect on what they already know, and identify what they need to learn next. The pupils can share, discuss and reason with the stimulus displayed on the board. The class will share their ideas and reasoning with teachers. Teachers will then explore with pupils possible reasons and explanations, ready to begin the enquire part of the Science lesson. Within this Explore activity, other quality resources are used by teaching staff from a wide range of online platforms, including Explorify, BBC Bitesize and STEM.
- **Enquire challenge** activities are used to enable pupils to collect and analyse data to answer scientific questions and so develop their scientific understanding and knowledge. Pupil’s science investigations will involve them in first hand collection, recording and analysis of data, although sometimes they will use secondary sources of evidence or information to answer questions. In the Enquire challenges children will engage in a wide range of practical activity both indoors and outside, using a variety of observation and measuring equipment including data loggers and digital microscopes, everyday items and materials, natural and living things and electrical components. Teachers differentiate the three levelled enquire challenges, to cater for each pupil’s needs and ensure all pupils can access the learning in each Science lesson.
- **Reflect and Review** this part of the Science lesson provides the opportunity for pupils to summarise what they have found out, share their findings and reflect on what they have learned. This activity allows pupils to communicate what they have learned in an appropriate and meaningful way, this also enables teachers to gauge the depth of pupils’ understanding.

### **3. Assessment**

Pupils receive effective feedback throughout lessons and at the end of each unit of work. The explore and enquire approach for Science enables pupils to work scientifically across the range of units of work that they study. Teachers focus on techniques of questioning and observation to assess pupils’ acquisition of scientific knowledge and understanding and development of skills. Teachers successfully adapt lessons to meet the learning needs of all pupils and ensure any misconceptions that may occur, are addressed within the lessons. Pupils are provided with opportunities to review their learning as they progress through the unit of work and at the end of a unit.

At the end of each Science study unit, teachers assess pupils against the assessment criteria, using the range of sources of evidence that pupils have produced, to support their teacher assessment judgements. As pupils progress through the year they work scientifically throughout so the assessment judgement of scientific skills takes place at the end of the year.

Pupils are assessed as either working towards, expected or exceeding. Within each unit of work and the use of a range of key questions that form the unit of study, there is scope for pupils of a higher ability to demonstrate their depth of knowledge and understanding.

To support accuracy in teacher assessment and the judgements made, moderation takes place across the school and between year groups regularly. We expect all pupils to work towards gaining the scientific knowledge, understanding and skills required, by the end of KS1 and KS2.

At the end of the year, pupil outcomes inform future school/subject priorities.

#### **4. Planning & Resources**

Teachers use Snap Science to plan and deliver effective and engaging Science lessons. These Science lessons build on knowledge, skills, and scientific vocabulary across each year group. Early Years pupils explore Science through the new Early Years Framework, 2021, Understanding the World – The Natural World.

Each unit of work is fully prepared and ready to teach (teachers adjust and adapt lessons according to the needs of their pupils). It includes detailed lesson plans, slideshows for the teaching input, differentiated activities to cater for different learners' needs and offers suitable challenges within these lesson plans. There are a range of printable worksheets and other resources for every lesson needed across the whole year for any particular area of Science.

Science resources, such as switches, wires, mirrors, motors, bulbs, measuring equipment, magnifying glasses, and thermometers, etc. are located within individual classrooms. Resources within classrooms are accessible to all pupils and teachers will use resources to support their Science lessons. The Science subject leaders attend regular training through the Black Country Science Learning Partnership, a network of Walsall schools, to discuss best practice, funding opportunities and new ideas in Science and STEM. From this, leaders put together training on updates in Science and signpost new resources for teachers at King's Hill. Now with the focus firmly on working more scientifically, leaders ensure staff are aware of the need to develop the working scientifically areas for their pupils, in order for pupils to become critical thinkers and independent learners. Teachers are encouraged to use the school grounds as an outdoor classroom, where this will provide more purpose and context to the learning, for example, when teaching about living things, plants and materials.

#### **5. Organisation**

At King's Hill, from Year One to Year Six, Science is taught as a 1-hour lesson every week. The school has implemented a blocked curriculum approach to the teaching of Science. This ensures pupils are able to focus for longer on each topic of Science and develop a more secure understanding over time. This approach is also designed to enable pupils to progress to a greater depth of understanding. Subsequent blocks continue to consolidate previous learning so that pupils continually practise thinking and working scientifically.

Each academic year, all classes participate in British Science Week, whereby pupils will spend the day or sessions across the week, thinking and working scientifically through the

specific disciplines of biology, chemistry and physics. Parents are invited to view our work in a whole school exhibition. Year on year, this event builds on links with our school community. This continued yearly focus on science has been hugely successful and ensures the profile of science is high across the school.

## **6. EYFS**

In Early Years, children learn about science as part of Understanding the World and is in line with the new EYFS framework 2021. Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

## **7. KS1 and KS2**

From Year One to Year Six, we use a coherent programme of high-quality materials and activities, which are structured with great care to build deep conceptual knowledge and scientific thinking and understanding. Our KS1 and KS2 teachers use Science books to evidence pupils' work and progress within Science. Inside pupils' Science books, topic covers with key knowledge and learning for each Science topic are clearly displayed to organise pupils' work and inform teacher assessments. Science is formally planned using the King's Hill planning proforma. In this, teachers outline the lesson's learning objective, the explore, scientific enquiry, and the reflect and review parts of the lesson. Science lessons in both key stages follow the same sequence (see the previous section on Teaching & Learning).

## **8. Equal Opportunities and Inclusion**

The school is committed to ensuring the active participation and progress of all pupils in their learning. All pupils will be given equal opportunities to achieve their best possible standard, whatever their current attainment and irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation or the progress of which they are capable.

At King's Hill, differentiation during Science lessons occurs in the challenge and the level of support provided to different pupils, not in the topics taught. There is little differentiation in the content taught but the questioning and scaffolding individual pupils receive in class as they work through the enquire challenges will differ, with higher attaining pupils challenged through more complex enquire challenges, which deepen their scientific knowledge and understanding. Pupils' difficulties and misconceptions are identified through immediate formative assessment and are addressed within the Science lesson.



## **9. Role of the Science Team**

The Science subject leaders will:

- Maintain the high profile of science at King's Hill through best practice.
- Provide support to staff through training and the organisation of quality resources.
- Ensure classroom environments are conducive to learning, through effective use of displays and accessibility and availability of resources
- Ensure that all staff have access to Snap Science and support teachers in using Snap Science to deliver the Science curriculum
- Monitor how the subject is taught.
- Ensure that all pupils have access to, and receive a broad and balanced curriculum through memorable learning experiences that will enhance their knowledge, skills and understanding of Science.
- Organise, audit and purchase Science resources.

## **10. Parental Involvement/Home Links**

At King's Hill, we recognise that parents and carers have a valuable role to play in supporting their child's scientific learning.

- Each year, all year groups participate in British Science Week, inviting parents along to view our work in a whole school exhibition.
- Parents are informed of their child's progress in Science, which is communicated through written school reports.
- Each year group's expectations are shared with parents through termly newsletters so they are able to support them at home with the topics their child is learning about.

*To be reviewed July 2024*