

**WINGATE PRIMARY SCHOOL**

# **SCIENCE POLICY**

**May 2022**

# WINGATE PRIMARY SCHOOL SCIENCE POLICY

## **Our Whole School Intent Statement**

The rights and dignity of our children are at the heart of everything we do, every decision we and they make and every driver for making progress and helping our children to develop as responsible, valued global citizens who want to make a positive contribution to their and our world.

In our school it is our intent that we help children to develop resilience, perseverance, autonomy and focus. Our children learn that they are valued and valuable, they are independent people in their own right and they have the power to do wonderful, amazing things at every stage of every day.

Every one of our children is a unique individual with their own strengths, aptitudes, interests and dreams. As a school community we will endeavour to support each child to make the most of every opportunity we offer.

We provide enriching experiences to engage learners and in designing and developing our curriculum we have taken into consideration

- how children learn and remember; progress means knowing more and remembering more
- what our children need to succeed in life; the cultural capital they need to make aspirational choices and succeed beyond their time at Wingate Primary School.

The key drivers for our curriculum are:

Ambition and aspiration

Resilience and courage

Autonomy and independence

Perseverance and solution finding

## **Respecting Rights and the National Curriculum**

The policy is written with consideration to our school commitment to the Rights of the Child and our achievement of becoming a Rights Respecting School and it complies with Article 28 of the UNCRC 'Every child has the right to an education' as well as Article 29 'Education must develop every child's personality, talents and abilities to the full.' Although direct reference to this is not continuously made, the policy has been written with full awareness of our responsibility and commitment to children's Rights.

The National Curriculum provides a framework for science but the school is aware of the need for flexibility and creativity in teaching and learning styles in response to the needs of individual children.

## **Intent**

Science is a fundamental part of everyday life and developing understanding in this area is essential for the future of our world. At Wingate Primary School, we believe science

encourages children to ask questions and develop an understanding of the world around them. Science at our school promotes investigation, questioning and hands on experiences led by children's curiosity. We believe that all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science.

## **Implementation**

In ensuring high standards of teaching and learning in science, we implement a curriculum that is progressive throughout the whole school.

Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of, 'The National Curriculum programmes of study for Science 2014' and, 'Understanding of the World' in Reception. Science is taught as discrete units and lessons to ensure coverage. Science units ensure progression between year groups and guarantees topics are covered.

The acquisition of key scientific knowledge is an integral part of our science lessons. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons. At Wingate Primary School, teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

- We plan for problem solving and real life opportunities that enable children to find out for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating practical, engaging lessons with opportunities for regular, precise questioning in class to assess conceptual knowledge and skills, and to identify those children with gaps in learning.
- Our curriculum is progressive. We build upon the learning and skill development of the previous years. Teachers identify misconceptions that need addressing at the start of each unit of work.
- Working scientifically skills are embedded into lessons to ensure these skills are being developed. New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in keeping with the topics.
- Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts such as Captain Chemistry.
- Through enrichment days, such as 'Science Week' and through links with Durham University, we promote the profile of science and allow time for the children to freely explore scientific topics.

## **Impact**

The impact of our science curriculum is that children at Wingate Primary School enjoy science and this results in motivated learners with sound scientific understanding. Our children are equipped with the scientific skills and knowledge that will enable them to progress from their starting points, and within their everyday lives. Our aim for science is to increase the skills needed to navigate an ever-changing world of science and technology by immersing our

children with scientific enquiry skills, key scientific knowledge and investigative skills. Children will have a richer vocabulary which will enable them to articulate their understanding of taught concepts.

## **Purpose of study**

A high-quality science education provides the foundations for understanding the world through the specific disciplines of Biology, Chemistry and Physics. Science has changed our lives and is vital to the world's future prosperity, and 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. They should be encouraged to understand how key foundational knowledge and concepts can be used to explain what is occurring, predict how things will behave, and analyse causes. This foundational understanding should be consolidated through their appreciation of the specific applications of science in society and the economy

## **Aims:**

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.

## **Scientific knowledge and conceptual understanding**

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

will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

## **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 should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might 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.

## **Spoken language**

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum –cognitively, socially and linguistically. The quality and variety of language that pupils 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 pupils build secure foundations by using discussion to probe and remedy their misconceptions.

## **Attainment targets**

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study

## **Science and the National Curriculum**

### **Key Stage 1**

The principal focus of science teaching in Key Stage 1 is to enable pupils 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' is described separately in the programme of study, but must

always be taught through and clearly related to the teaching of substantive Science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils 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**

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. 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 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’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

## **Upper Key Stage 2**

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. 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 fair tests and finding things out using a wide range of secondary sources of information. Pupils 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 and thinking scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.

## **Organisation**

### **Reception**

Science in Reception is covered in the 'Understanding the World - the natural world- area of the EYFS Curriculum. It is introduced indirectly through activities that encourage our children to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

Science in the Early Years also helps children with skills in other areas of learning, such as Physical Development and Expressive Arts and Design through hands on investigation and observational drawings of the world around them. During the first year at school, our children will explore creatures, people, plants and objects in their natural environments. They will observe and manipulate objects and materials to identify differences and similarities. They will also learn to use their senses, exploring the world around them to develop an understanding of the world. They will make lots of observations of animals and plants and explain why some things occur and talk about changes they see.

A fundamental part of UtW therefore is the children's ability to communicate effectively as scientists in order to make sense of the things they see. We at Wingate Primary School believe this key skill needs to be developed as a priority to allow our children to progress as young scientists. We put a huge emphasis on speech and language and focussing on the effective use of vocabulary when discussing aspects of the world around them.

### **Key Stage 1 and Key Stage 2**

At Wingate Primary we plan our topic coverage as a whole school. Each year group covers National Curriculum objectives specific to their classes during their Science teaching.

Science is taught as a discrete lesson and as part of cross-curricular themes when appropriate. Science has links with other areas of the curriculum including Geography, English, Maths, Art and Design Technology.

Teachers in Key Stage 1 and 2 use the National Curriculum Guidelines to inform Medium Term planning. Teachers also use a wide range of resources, including the school environment to enhance and enrich the children's learning.

Children work at their own level of understanding in science. We aim to ensure that children are given the opportunity to achieve through their experience of science tasks and activities, and always provide the opportunity for our children to work towards higher level tasks.

Assessment in science is based upon scientific knowledge and understanding, rather than achievement in English or Mathematics. In Reception we assess children's knowledge and understanding according to the Early Learning Goals. In KS1 and KS2 we use a range of assessment materials to ensure that children are making appropriate progress and these are results are recorded half termly.

Our MAT Co-ordinator records achievement of children working beyond expected levels monitoring planning and provision for the most able children in our school. All staff strive to ensure that our children reach their full potential in science and that they understand and enjoy their experiences. Children with Special Educational Needs will be monitored by our

SEN Co-ordinator ensuring that these children follow the National Curriculum Programmes of Study through work schemes that promote the child's development and self-esteem.

Multi-Cultural links will be developed wherever possible in the teaching of this National Curriculum subject. We endeavour to include aspects of science within our themed weeks in school so that our children begin to realise the global importance of science. We have Healthy School Weeks based around PE and science topics and themes.

Through the teaching of science we are developing the schools Eco awareness and the global impact of this.

### **Assessment should:**

- Be formative and summative
- Be used to inform the teacher for future planning
- Promote continuity and progression
- Form the basis for reporting to parents
- Be based on observation, participation and written outcomes

### **Recording**

Children's recording will take many forms according to the nature of the activity:

- Verbal
- Pictorial
- Diagrammatic
- Graphical
- Written
- Symbolic
- I.C.T.
- Photographic

### **Classroom Organisation**

Children will be grouped as appropriate for the task in order to encourage flexibility:

- Ability groups
- Mixed ability groups
- Mixed ability partners
- Ability partners
- Individuals
- Whole class groups

Science is a hands on experience and all the children are given the opportunity to use their senses. Children are encouraged to:

- Observe, discover and experiment
- Develop scientific language
- Question and report
- Sort and classify
- Look for similarities and differences

### **The Role of the Science Co-ordinator:**

- To review changes to the National Curriculum requirements and advise on their implementation.
- Attend relevant CPD courses for Science as appropriate in line with the School Development plan.
- Carry out an annual audit of the school's Science resources, and operate an efficient storage system for these resources to ensure that our children can learn effectively in and through Science.
- Liaise with the school's SENCO and MATCO regarding the progress of individual and groups of children.
- Collate assessment data and set new priorities for development of Science in subsequent years.
- Monitor the learning and teaching in science and provide support for staff when necessary.
- Take a lead role in organizing Science Events in school in line with LA and national initiatives.
- Endeavour to involve parents/ carers in their children's learning in and through science.

This policy was written by the Science Co-ordinator following discussions with the teaching and support staff at Wingate Primary School.

The policy will be reviewed again in May 2023