



## **Woburn Lower School**

### **Science Policy**

#### **What is Science?**

- Developing the understanding of important scientific ideas, processes and skills and relating these to everyday experiences
- Learning about ways of thinking and or finding out about and communicating ideas
- Exploring values and attitudes through science

#### **Intent**

The 2014 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.

At Woburn Lower School, we encourage children to be inquisitive throughout their time at the school and beyond. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the 'Working Scientifically' skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings

## Implementation

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science.

Our whole school approach to the teaching and learning of science involves the following;

- Science will be taught in planned and arranged topic blocks by the class teacher, to have a project-based approach. This is a strategy to enable the achievement of a greater depth of knowledge.
- Through our planning, we involve problem solving opportunities that allow children to apply their knowledge and find out answers for themselves. Children are encouraged to ask their own questions and are given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.
- We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning.
- Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.
- Regular events, such as Science project days allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills.

## Impact

The successful approach at Woburn Lower School results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and first hand experiences of the world around them. Frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. Through various workshops and trips children have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Children learn the possibilities for careers in science and have access to positive role models within the field of science from the immediate and wider local community. From this exposure to a range of different scientists from various backgrounds, all children feel they

are scientists and capable of achieving. Children at Woburn Lower School overwhelmingly enjoy science and this results in motivated learners with sound scientific understanding.

At Woburn Lower School we believe Science is good when:

- We apply our 'working scientifically skills' to solve problems, explore, observe and investigate.
- We ask questions and work together to discover the answers
- Science has a 'wow' factor and promotes a sense of awe and wonder
- Our learning is enhanced by outdoor learning, specialist visitors and we have access to quality resources
- We are involved in creating and carrying out investigations and can share and explain our ideas and conclusions
- We take a cross curricular approach to teaching Science

### **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. Children's starting points are identified at the beginning of each science topic and the children are able to convey and record what they know already. At the end of the block, children's knowledge is checked in line with the key knowledge identified prior to the teaching block. 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 and teachers ensure that this is developed within each lesson and throughout each science topic. The science curriculum ensures that children are provided with regular opportunities to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data, children are also able to suggest what they would like to learn at the start of each teaching sequence and this ensures that teachers are able to adapt the programme of study to ensure that this is informed by children's interests and to maximise their 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 and this is embedded within lessons and focuses 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 include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils are given opportunity to 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. At Woburn Lower School science lessons provide a quality and variety of subject specific language to enable the development of children's confident and accurate use of scientific vocabulary and their ability to articulate scientific concepts clearly and precisely. They are encouraged and assisted in making their thinking clear, both to themselves and others, and teachers ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

## **Planning and Resources**

Planning is a process in which all teachers are involved. All teachers should keep a copy of the termly and weekly planning in their files. We use the DFES Science scheme of work and the Kent Scheme of work was introduced with the change in curriculum for primary science to also inform teacher's planning. The key knowledge and skills of each science topic is also informed by the Associate of Science Education's 'Planning Matrices'. Teachers also have access to the Hamilton resources and are able to source further support and resources, inline with national pedagogy, from the National Stem Centre.

We have sufficient, high-quality science resources to aid and support the teaching of all units and topics taught, from EYFS to Y4. We keep these in a central store, where they will be labelled and easily accessible to all staff. EYFS have a range of resources kept in classes, for simple access for children during exploration. The library contains a good supply of science topic books to support children's individual research.

## **Organisation**

### **Foundation Stage**

The Foundation Stage deliver science content through the 'Understanding of the World' strand of the EYFS curriculum. This involves guiding children to make sense of their physical world and their community through opportunities to explore a range of tools safely; encounter creatures, people, plants and objects in their natural environments and in real-life situations; undertake practical 'experiments'; and work with a range of materials. They are assessed according to the Development Matters attainment targets.

By the end of the EYFS, children should:

- Investigate objects and materials by using all of their senses as appropriate.
- Find out about, and identify, some features of living things, objects and events they observe.
- Look closely at similarities, differences, patterns and change.

- Ask questions about why things happen and how things work.
- Build and construct with a wide range of objects, selecting appropriate resources and adapting their work where necessary.
- Select the tools and techniques they need to shape, assemble and join materials they are using.
- Find out about and identify the uses of everyday technology and use information and communication technology and programmable toys to support their learning.
- Find out about past and present events in their own lives, and in those of their families and other people they know.
- Observe, find out about and identify features in the place they live and the natural world.
- Find out about their environment and talk about those features they like and dislike.
- Begin to know about their own cultures and beliefs and those of other people.

### **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.

### **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 comparative and 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.

### **Making Cross Curricular Links**

At Woburn Lower School we believe that making links between curriculum subjects promotes skills and processes that will deepen the children's understanding by providing opportunities to reinforce and enhance learning. Much of our formative assessment will be taken from cross curricular work where children are applying taught matters, skills and processes.

### **Information and Communication Technology**

The pupils' ICT skills are applied at both key stages by the pupils using ICT to ; locate and research information (internet); record findings (using text, data and tables); log changes to the environment over time (sensing equipment); gain confidence in using digi-scopes, data loggers, calculators, video cameras, digital cameras, and microphones as well as the computer.

### **Personal, Social and Health Education**

Health education is taught as part of the units on humans such as, health and growing, the digestive system, the circulatory system, skeletons and muscles, teeth and eating, moving and growing, keeping healthy and life cycles.

### **Assessment**

Children's progress is continually monitored throughout their time at Woburn Lower School and is used to inform future teaching and learning. 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 as set out in the National Curriculum. These are set out as statutory requirements. We also draw on the non-statutory requirements to extend our children and provide an appropriate level of challenge.

Children receive effective feedback through teacher assessment, both orally and through written feedback in line with the success criteria. Children are guided towards achievement of the main objective through the use of process based 'success criteria', provided by and explained by the teacher. Children will have these to refer to in the lesson, where they will be evident in their books and used to identify areas of difficulty by children and teachers when reviewing and assessing work.

Assessment for learning is continuous throughout the planning, teaching and learning cycle. However children are more formally assessed half termly in KS1 and KS2 using a variety of methods:-

- Observing children at work, individually, in pairs, in a group, and in classes.
- Questioning, talking and listening to children
- Considering work/materials / investigations produced by children together with discussion about this with them.

Children identify what they know already about each topic, as well as what they would like to know. The programme of study is responsive to the children's starting points, as well as their specific interests. It also ensures a focus on the key identified knowledge of each topic, which is mapped within and across year groups to ensure progression. At the end of each blocked science topic, this key knowledge is checked. Outcomes of work also evidence its acquisition.

In EYFS, we assess the children's Understanding of the World according to the Development Matters statements and some aspects of Expressive Arts Design are also science based.

### **Self-Assessment and Peer Assessment**

Peer and self-assessment are ways of engaging children in understanding their progress in learning and identifying next steps in their learning. The aim is to involve children in the analysis and enable constructive ways to improve their own and others' work. Learners use the success criteria to make judgements on their own and peers learning and identify areas for development ie their next steps.

### **Equal Opportunities (eg Gender, race)**

At Woburn Lower School we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class.

### **Inclusion**

In school we aim to meet the needs of all our children by differentiation in our science planning and in providing a variety of approaches and tasks appropriate to ability levels. This involves providing opportunities for SEND children to complete their own projects, with support, to develop speech and language skills, as well as scientific skills and knowledge. This will enable children with learning and/or physical difficulties to take an active part in scientific learning and practical activities and investigations and to achieve the goals they have been set. Some children will require closer supervision and more adult support to allow them to progress whilst more able children will be extended through differentiated activities. By being given enhancing and enriching activities, more able children will be able to progress to a higher level of knowledge and understanding appropriate to their abilities. Teachers ensure that a range of strategies are used which include and motivate all learners, ensuring that optimum progress is made throughout each part of the lesson.

### **Role of the Subject Leader**

It is the responsibility of the subject leader to monitor the standards of children's work. The subject leader is also responsible for supporting colleagues in their teaching, for being informed about current developments in the subject, and for providing a strategic lead and direction for science in the school. The subject leader monitors the budget, resources science topics and books trips and workshops to support learning. The subject leader has specially allocated time for fulfilling the task of reviewing samples of children's work, training and liaising with other subject leaders from other schools.

### **Parents**

Parental input is highly valued and parents are regularly invited and welcomed into school to share their own expertise with the children. This has greatly enhanced the school's ability to implement STEM activities and help to inspire the next generation of scientists.

### **Governor:**

**Date: May 2023**

### **Headteacher:**

**Date:**

**Review date: May 2024**