

## **Redscope Primary School**

### **A whole school Science Policy**

#### **Why we teach Science at our school**

Science makes an increasing contribution to all aspects of our life. We are living in an increasingly scientific and technological age where children need to acquire knowledge, skills and attitudes to prepare them for life in the 21<sup>st</sup> century. Children are naturally fascinated by everything in the world about them and science makes a valuable contribution to their learning and to their understanding of the world in which they live.

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.

In the past, Ofsted has recognised that when taught well, Science can boost Literacy and Numeracy skills and can raise standards. It is important that children have access to a broad and balanced curriculum and that every child is engaged and motivated to learn science.

#### **Aims of our Science Teaching**

Our main aim at Redscope Primary School is to encourage children, whatever ability or gender, to enjoy Science and build on their natural curiosity. We aim to teach the children specific skills and develop their scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. By stimulating them, we hope they will learn to investigate and develop a questioning attitude about the world around them. Through practical work, children will develop skills of observation, prediction, investigation, interpretation, communication, questioning, hypothesizing and increased use of precise measurement skills and ICT. We also aim to ensure that children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

In all key stages, 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 as set out in the progression document. 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.

‘Working scientifically’ specifies the understanding of the nature, processes and methods of science for each year group. It is not taught as a separate strand but in creative and innovative ways which motivate and inspire children to learn. Children should be able to vocalise when they are ‘being scientists’.

Science at Foundation Stage comes under the area of learning known as ‘Knowledge and Understanding of the World’ and is introduced indirectly through activities that encourage children to explore, problem solve, observe, predict, think, make decisions and to talk about what they do and see in the world around them.

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. Children 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.

#### How we plan our Science

At Redscope Primary school we base our teaching on the Programmes of Study for Key Stage 1 and 2 as specified in the Primary National Curriculum. EYFS use statements from the Development Matters curriculum and will look for opportunities to show the children when they are being scientist. Staff will use carefully chosen language to encourage science-based behaviours and will encourage the children to explore the world around them.

The programmes of study describe a sequence of knowledge and concepts. The science curriculum has clear progression documents which have been adapted to meet the needs of our pupils. These documents have been developed within the MAT using PLAN support documents from a leading team in primary science consultancy. Science leaders across all schools have contributed to the development of these documents and they continue to be a working document. The documents also identify opportunities for science to take place outside of the classroom. Where possible, staff are encouraged to make use of natural environments within the local area such as Barker’s Park and the woodland area that surrounds it. Staff have the freedom to deliver science in creative and engaging ways and are encouraged to make use of a wealth of high-quality resources that are available in the central store.

At the start of every unit, prior learning is recapped and this can be undertaken in a variety of ways. Children will carry out a pre-learning assessment exercise which shows what they know and provides an opportunity to ask questions about the subject before they begin the unit. Teachers will identify the key focussed vocabulary at the start of every unit. At the start of every lesson, retrieval practice occurs and key vocabulary is recapped so that the learning

sticks. All lessons are sequential, build on prior learning and work towards a final presentation of learning through the post-learning assessment exercise. Children can identify the five key areas of working scientifically and are encouraged to explain the key disciplinary skills needed in order to be a successful scientist. For all concepts in each year group, planning documents have fingertip facts which provide staff with the key learning required for the unit. It is expected that all children will be able to recall those facts at the end of the unit and beyond. Staff will encourage children to draw upon these facts at various points within the year.

Creativity and teacher expertise are woven into the curriculum with specialist teachers from the local comprehensive schools and outside agencies such as AMRC, working with pupils and teachers, sharing good practise and ensuring that learners learn to be the best that they can be. Major events such as Science and Engineering week are celebrated within school to further raise the profile of Science. When possible, to encourage cultural capital, children are exposed to a variety of professionals within the world of Science and are provided with opportunities to learn more about specific sectors. In order to tackle stereotypes, 'Scientist like me' posters are displayed and discussed in class. This is carefully planned in at the start of each unit and shared with the children. It is hoped that children will aspire to be scientists one day and contribute to society.

### Enterprise Education

Enterprise education can help raise aspirations and develop valuable skills for life. Enterprise education plays an important role and can be embedded into all subject areas. Teachers will plan opportunities for enterprise within Science, highlighting the key outcomes of the 'Big 13' where necessary throughout the whole of the curriculum years.

Links are made with the gardening club so that elements of Science and Enterprise education can be brought together when opportunities arise. The gardening area has been adapted and continues to be developed so that produce can be grown and sold.

### Teaching Methods

We believe that the best way to learn Science is through practical experiences. Pupils are encouraged to be open-minded. Children should be helped and guided in making sense of their experiences through discussion and application of their learning experiences to new situations.

In light of new initiatives in school, teachers should be encouraged to ask challenging open-ended questions. Children should also be encouraged to ask more questions and carry out their own research and investigations to find answers. Further to this, staff should provide

opportunities for retrieval practice in order for learning to move from the working memory to the long term memory.

We also take part in national initiatives to increase children's awareness of Science such as Science Week. During Science week events are organised which all children can take part in, including whole school presentations from outside agencies which increase children's interest in the subject. The Leaders' Award is also something which school intends to take part in so that the children can build on STEM learning with outside agency involvement.

When opportunities arise, children are invited to take part in afterschool Science clubs. These are very popular and teach science in an exciting way which helps to raise the profile of the subject further.

### Working with the MAT

The subject leader will work with other leaders across the academy within a working party. Staff will share good practise and find ways to work collaboratively to optimise the teaching and learning of science. When appropriate, action plans are produced in order to work towards a shared goal. This is shared with the head teachers and governing body of all schools.

### Equal Opportunities and Differentiation

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

Children of all abilities can benefit from the study of Science. Both girls and boys are encouraged to take an active part in scientific investigations. We seek to use starting points, which appeal to both boys and girls.

We structure activities for the varying abilities of our children, thus ensuring differentiation. Some children will require closer supervision and more adult support to allow them to progress whilst more able children will progress through more challenging 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.

### Resources for Science

We have found from experience that most Science resources are best stored centrally. We have a dedicated resource room located in the upper hall. As each new topic is started, labelled resource boxes are taken for individual class usage, being returned in completion. Equipment is ordered when required with all staff being consulted as to their scientific needs and requests when new topics are planned. ICT based resources are available such as data loggers and ipads (with appropriate apps) and the science co-ordinator can provide

training for this. Staff are expected to report any damaged, unsafe or worn-out equipment to the Science co-ordinator for repair or replacement. Children and staff are encouraged to use all resources with care.

### Safety in Science

We accept a responsibility to plan safe activities for Science, referring when in any doubt, to the A.S.E publication 'Be Safe' and directives from the L.A. No animals are kept on school premises for health reasons. Teachers have a responsibility to ensure all Science lessons are taught safely and that any potential risks are minimised.

### Assessment Policy

We build assessments into our teaching and use the results to plan appropriate work. Any tests activities should be of benefit in their own right and contribute to the children's learning. Children complete 'Have a go' tasks at the start of every unit and complete 'Show what you know' activities at the end of each unit. Children recall the fingertip facts and produce double page spreads to show their understanding of a unit. 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. These are highlighted in progression documents.

Teachers use the grading system to identify children who are working at expected level, above or working towards their learning across the Science curriculum. This information is used to monitor coverage over the year and to assess the level which children are working at within each year group.

### Role of the Head teacher

The Head teacher has a vital role in encouraging colleagues to deliver Science teaching effectively. She has overall responsibility for ensuring that the Science policy is used effectively.

### Role of the Science Co-ordinator

The Science Co-ordinator, working with the Head teacher, has responsibility for co-ordinating and monitoring the teaching of the Science curriculum. She has the task of maintaining and purchasing Science equipment. She supports colleagues in Science planning and is a resource for Science knowledge for all the school. She will also attend Science courses where teaching ideas and new developments in Science can be shared in staff meetings. The Science co-ordinator also works with outside agencies such as STEM to keep up to date on Science developments.