

Ash Green Community Primary School

C6

SCIENCE POLICY

1. ETHOS

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 science can be used to explain what is occurring, predict how things will behave, and analyse causes.

2. AIMS

The key aims of the school's science provision are developed through pupils' own experiences at EY and an agreed programme of science topics (covering the national curriculum programmes of study) throughout KS1 and KS2 that enable pupils to:

- 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
- Be equipped with the scientific knowledge required to understand and present the **uses and implications** of science, today and for the future.

3. POLICY

TEACHING AND LEARNING METHODS

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 area 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 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 must 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.

Teaching will ensure that scientific enquiry skills are used when developing knowledge and understanding. A range of classroom management strategies will be employed to ensure all pupils work as part of the whole class, collaboratively (groups/pairs etc.) and individually.

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.

School curriculum

During the EY the focus will be to develop children's knowledge, skills and understanding, thus enabling them to attain the specific early learning goal relating to similarities and differences of objects, materials and living things. They will make observations of animals and plants and explain why some things occur, and talk about changes.

As pupils move into KS1 the principal focus of science teaching is to enable them to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They will be encouraged to be curious and ask questions about what they notice. They will 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. Pupils will be taught 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 will be done through the use of first-hand practical experiences, but there will also be some use of appropriate secondary sources, such as books, photographs and videos.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

During KS2 the principal focus of science teaching in lower KS2, is to enable pupils to broaden their scientific view of the world around them. They will 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. Pupils are encouraged to 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, spelling scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

As pupils progress to upper KS2, they are taught to develop a deeper understanding of a wide range of scientific ideas. They will 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 will encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. Pupils will also be taught 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 comparative and 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. Most should be able to read, spell and pronounce scientific vocabulary correctly.

For all key stages 'Working scientifically' will always be taught through and clearly related to substantive science content in the programme of study.

All science activities will be supported by a wide range of resources including computing and digital software. All tasks are appropriately differentiated.

HEALTH AND SAFETY

Health and safety guidance specified in the Health, Safety and Well-Being Policy (M23) is followed. In addition, we adhere to the additional health and safety guidance for science teaching, issued by the Local Authority.

ORGANISATION OF SCIENCE CURRICULUM

A range of activities planned towards the Early Learning Goals in prime areas are delivered throughout the EY. Science topics are taught in KS1 and KS2 (designed around the programmes of study from the 2014 national curriculum) on an annual programme - mainly as a discrete subject but with elements reinforced through other topics in the whole school thematic curriculum and possibly supplemented with assemblies, event days and/or theme weeks to ensure coverage of the programmes of study at each key stage.

DETAILED PLANNING

Medium term planning will identify learning objectives, a progression of activities, identification of core skills and key language. This is undertaken in planning teams to ensure parity of learning outcomes. Progress is regularly checked throughout the unit and pupils are assessed against the learning outcomes. Short term planning is the responsibility of individual class teachers. Lesson objective(s) are specified with an appropriate activity, modification/extension tasks. Day to day assessment by the class teacher informs future learning. Barriers and aids to achievement are identified as part of short term plans to ensure effective learning for all individual and groups of pupils. Styles of writing are linked to and from literacy lessons as appropriate.

RESOURCES

The Scheme of Work for science follows this policy in the schools' Curriculum File. Resources central to the study of science are located in clearly labelled cupboards. Additional resources are continually being acquired to ensure that children have access to a range of stimulating high quality material. Teachers should also ensure that children care for all resources. Additional resources are available from the CEU.

All resources are safe, stored securely and potentially dangerous equipment will only be used where appropriate and under strict supervision.

ASSESSMENT AND RECORD KEEPING

Teacher assessment of pupils' targets against National Curriculum Statements is made at the end of each topic using the schools' model for assessment linked to the learning outcomes and end-of-year (age related) expectations.

CONTINUING PROFESSIONAL DEVELOPMENT

Opportunities will be provided in line with an analysis of needs linked to the implementation of the school's science policy and the delivery of the scientific elements of the topic plans. Curriculum audits

and staff skills audits (utilising the teachers' standards framework) are completed annually; the results of which are fed into a subject development plan and/or the School Improvement Plan. Funds for professional development may be used to support a range of training activities.

REVIEW AND EVALUATION

The policy for science will be reviewed annually as an agenda item at a staff meeting, led by the science subject leader. Comments from staff and governors will be taken into account and any changes to policy agreed at a staff meeting prior to ratification by the governing body. The implementation of the policy will be monitored by the head teacher who will if necessary call on external agencies to give specialist advice.

*Reviewed and amended Sept 2017
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