Woodcroft Primary School

Science Policy

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1. Aims and Objectives

An effective Science education equips children with an understanding of the world through the study of biology, chemistry and physics. In doing so, children develop their knowledge of the key foundational concepts and are empowered to ask their own scientific questions. Through a positive learning environment, children are encouraged to show excitement and curiosity to new and existing ideas and should understand the processes needed to carry out their own line of enquiry. Through scientific processes the world has changed completely, and children should recognise the impact science has had and will have on the future. With this knowledge, children should be able to identify patterns, predict outcomes and analyse results in order to prepare them more fully, for understanding existing scientific concepts and for predicting future developments.

Our key objectives in the teaching of science are:

- Teach the key concepts within each science topic according to the National Curriculum
- Extend learning through greater subject knowledge and opportunities for open ended investigations
- Empower children to ask their own scientific questions
- Teach children the steps needed to complete a scientific investigation
- Use the local environments and real life experiences to make science more relevant and personal
- Ensure there is a clear progression of learning throughout the year groups
- Incorporate a cross curricular approach, including the use of ICT to Science

2. Teaching and Learning

The aim that teachers should have when teaching Science is to equip their students with both a firm knowledge of the scientific processes and with the ability to ask and answer their own scientific questions. Whilst the national curriculum identifies these two skills separately, teachers should ensure that scientific enquiry and exploration go hand in hand with recalling facts and processes. Science should be taught as often as possible through real life resources and experiences that the children can relate to and will find memorable. Children should be able to describe processes with both common language and in technical terms to show by the end of KS2, a deeper understanding of a concept. Whilst school terms can become busy and the curriculum demanding, science should remain a high priority as the subject is essential in providing children with an understanding of the world they live in and will prepare them with an understanding of their own futures.

We recognise that in all classes, children have a wide range of scientific abilities, and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the understanding of the child. We achieve this in a variety of ways:

- setting tasks which are open-ended and can have a variety of responses
- setting tasks of increasing difficulty (we do not expect all children to complete all tasks)
- sometimes grouping children by ability and setting different tasks for each ability group
- providing resources of different complexity, matched to the ability of the child
- using teaching assistants to support the work of individual children or groups of children

3. Planning

Teachers should follow the whole school curriculum plan in order to know which topics they need to teach within their year groups. These topics are flexible to be taught at any point in the year and should aim to be organised to support learning across the curriculum (for example, linking to a history or geography topic). At the beginning of each topic, teachers should familiarise themselves with the expected outcomes for the topic, these can be found in the National Curriculum or through the Target Tracker assessment programme. It is important for teachers to do this as it ensures a progression of learning between the year groups. Having aimed to meet these objectives, teachers can then decide any additional information that could be included into the topic to create further interest and extend the learning.

To introduce a new topic a teacher should aim to provide a fun, memorable experience that will bring excitement around the subject. For example, a teacher could lay out a range of short activities with thought provoking questions to encourage the children to start to wonder about the topic. This starter lesson is useful in both generating more excitement for the topic and can also provide an excellent baseline for the teacher as the informal setting allows for easier discussion and ideas to be shared between the children.

Following on from this lesson, the teacher will then begin to teach the objectives that have been previously planned. Understanding the children's previous knowledge and misconceptions is paramount for pushing the children onto a deeper understanding of the subject and should be considered as each lesson is planned for. During this period, teachers should plan to include opportunities for investigation and real life experiences, for example by visiting the local park or the nature preserve.

Planning is conducted in two formats. Firstly through the termly curriculum wheel, which states the objectives for the two science topics that will be covered within that term and secondly on a lesson by lesson basis. The lesson plan should include the lesson's aim, expected outcomes with differentiated success criteria and the teaching steps to approach this outcome. These two formats are monitored and topics are often discussed informally with the science coordinator.

4. The Early Years Foundation Stage

We teach science in reception classes as an integral part of the topic work covered during the year. The reception class is part of the Early Years Foundation Stage. We therefore relate the scientific aspects of the children's work in the Knowledge and Understanding of the World area of learning to the objectives set out in the Early Learning Goals (ELGs) which underpin the curriculum planning for children aged three to five. Science makes a significant contribution to developing a child's knowledge and understanding of the world, for example. through investigating what floats and what sinks when placed in water.

5. Science as part of the Creative Curriculum

English

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the children study in the literacy hour are of a scientific nature. These skills empower children to express their ideas more clearly, both in writing and verbally. The children further develop oral skills in science lessons through discussions (e.g. of the environment) and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

Mathematics
Science contributes to the teaching of mathematics in a number of ways. When the children use weights and measures, they are learning to use and apply number. Through working on investigations, they learn to estimate and predict. They develop accuracy in their observation and recording of events. Many of their answers and conclusions include numbers.

Humanities subjects
Science contributes significantly to the teaching of humanities. For example, there are many overlaps with geographical understanding as children learn about their environment and how it has changed over time. Some important people important to the development of science are studied in history lessons. Teachers will take opportunities that arise in science lessons to explore issues of awe and wonder in the natural world.

Personal, social and health education (PSHE) and citizenship
Science makes a significant contribution to the teaching of PSHE and citizenship. This is mainly in two areas. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare. For example, children study the way in which people recycle material and how environments are changed for better or worse. Secondly, the subject gives children numerous opportunities to debate and discuss. They can organise campaigns on matters of concern to them, such as helping poor or homeless people. Science thus promotes the concept of positive citizenship.

Spiritual, moral, social and cultural development
Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking, and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet, and how science can contribute to the way in which we manage Earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people.

Science and Computing

Computing enhances the teaching of science in our school significantly, because there are some scientific investigations where ICT can be particularly useful. It also offers ways of impacting on learning which are not possible with conventional methods. Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impractical to do directly in the classroom. Data loggers are used to assist in the collection of data and in producing tables and graphs. Children use ICT to record, present and interpret data, to review, modify and evaluate their work, and to improve its presentation. Children learn how to find, select, and analyse information on the Internet and on other media. They also use e-mail to communicate on their scientific findings with children in other schools and countries.

7. Science and Inclusion

At our school, we teach science to all children, whatever their ability and individual needs. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our Science teaching, we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents, and those learning English as an additional language, and we take all reasonable steps to achieve

this. (For further details, see individual whole-school policies on Special Educational Needs, Disability Discrimination, Gifted and Talented Children, and English as an Additional Language (EAL).)

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, differentiation – so that we can take some additional or different action to enable the child to learn more effectively. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. This ensures that our teaching is matched to the child's needs.

The work done by a child in science may contribute towards their targets as set out in their Individual Education Plan (IEP). Teachers will have regard for these targets when planning and designing tasks for science lessons.
We enable all pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom (e.g. a trip to a science museum), we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

8. Assessment

Within Science, teachers use a range of assessment strategies which can be both formative and summative. Throughout a topic, teachers will use a variety of formative assessment strategies to identify what their students have understood and move them on. At Woodcroft we ensure that every piece of work is marked and there are next steps given to the children for every third piece at least. The children respond to our comments using their purple pens and this system helps to clarify their learning and move them on. In key stage 2, we also encourage peer and self assessment, where children are empowered to assess the learning against the success criteria for that lesson. The assessment generated at the end of each lesson will provide the teacher with the information of where to move the learning onto next and which children to focus on more closely in the following lesson.

At the end of a unit of work, the teacher makes a summary judgement about the work and progress of each pupil. The information needed to make this judgement is found on the school's assessment system: Target Tracker. Through this system, the teacher can identify whether the student is working towards, has achieved or has mastered the objectives within the topic. It is expected that every teacher assesses these objective statements for their class throughout each topic. This information can be accessed by the next class teacher and can provide a greater insight into the understanding each pupil holds.

9. Resources

We have sufficient resources for all science teaching units in the school. We keep these in a central store, where there is a box of equipment for each unit of work. There is also a collection of science equipment which the children use to gather weather data. The library contains a good supply of science topic books to support children's individual research.

10. Monitoring and review

The coordination and planning of the science curriculum are the responsibility of the subject leader who also:

- supports colleagues in their teaching, by keeping them informed about current developments in science and providing a strategic lead and direction for this subject
- Creates a yearly and three yearly development plan to improve the teaching and learning of science
- gives the headteacher a monthly summary report in which the strengths and weaknesses in science are evaluated and areas for further improvement are indicated.

The quality of teaching and learning in science is monitored and evaluated by the headteacher as part of the school's agreed cycle of monitoring and evaluation.

This policy will be reviewed every two years or sooner if necessary.

Signed: **Date:**