



Woodchurch C of E Primary School Science Policy



Science Subject Leader: Joe Priestley
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Intent, Implementation and Impact Statement

Intent

At Woodchurch C of E, we aim to instil our pupils full of awe, wonder and curiosity about the world around them. Our science lessons ensure this is achieved through meaningful hands-on lessons, encouraging children to question what they know and what they want to find out through all areas of scientific enquiry. In an ever-changing world, where our children's future jobs may not even exist yet, it is vital our children understand how science has already changed their lives and how it may shape future prosperity.

In line with the National Curriculum, teachers In Key Stage 2 endeavour to cover the three main areas of science: Biology (humans, animals and plants), Chemistry (all things to do with materials and how they change) and Physics (forces, light, sound electricity and earth and space). In Key Stage 1 the focus is on Biology and Chemistry. Through their substantive learning over the course of their time at school, it is our intent that children will have a firm foundational knowledge of physics, chemistry and biology that allows them to access the KS3 curriculum as soon as they arrive in year 7.

All science lessons allow children to enhance their skills in working scientifically which provide our children with then chance to: ask and answer scientific questions; research effectively; observe closely; take measurements, analyse and interpret their data; present their results in different ways; draw conclusions and evaluate the effectiveness of their approaches.

We use a tailored programme of work as a basis for our lessons, which has been designed around the content of the primary National Curriculum for science, as well as addressing areas from national research, e.g. OFSTED's Finding the Optimum report, and is full of exciting lessons to enthuse and nurture our scientists of the future.

Within the Science Curriculum it is our intent that the children will recognise themselves as Communicators (Orators), Readers, Explorer and Learners – opportunities to develop these skills will be built into the delivery of the curriculum and children will be encouraged to reflect on how they have demonstrated these skills within their learning.

Implementation

The acquisition of key scientific knowledge is an integral part of our science lessons. Linked knowledge organisers are being introduced which will enable children to learn and retain the important, useful and powerful vocabulary and knowledge contained within each unit.

The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons.

At Woodchurch C of E 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;

- Science is taught in planned topic blocks by the class teacher, in most cases organised in a way through the school year to allow children to see links within science and other subject areas. Our strategy is to enable all children to be catered for through adapted planning from the Science Bug scheme suited to their abilities.
- Our curriculum is progressive. We build upon the learning and skill development of the previous years, which is revised through start of unit knowledge assessment activities where teachers can identify misconceptions that need addressing.
- 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.
- Science lessons are adapted to meet the needs of all learners, including SEND to ensure that children are given the opportunity to achieve the expected standard within science, and children who achieved the standard easily will be given opportunities to deepen their understanding via supportive questioning and deep-thinking extension activities.
- 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 in our local environment.
- Through enrichment days, such as 'science week', we promote the profile of science and allow time for the children to explore scientific topics which they may not naturally have the chance to do within the National Curriculum.

Children will achieve the national standard in all substantive and disciplinary areas of the National Curriculum for Science at Primary Level. Including the use of teacher assessments, judgements of substantive knowledge will be made through end of topic assessments using the Headstart Primary Assessment for Science materials.

Impact

If our intent and implementation are successful, then at Woodchurch C of E Primary we would expect to see:

- A broad and engaging curriculum that makes use of a range of resources, such as visitors and local attractions
- Children and staff who are enthusiastic about scientific learning
- Children and staff who can speak confidently about science, including uses in the real world
- Children who can use appropriate scientific vocabulary in oral and written form
- All children being successful in sharing their understanding of scientific concepts
- Children who can make links between different areas of science and other subject areas
- Children who can recall prior scientific learning when required and use this to understand new learning
- Children increasingly being able to instigate their own investigations confidently and interpreting their findings
- Staff who are able to anticipate potential misconceptions and address these confidently
- Children meeting their age-related expectations in science consistently

What is Science?

Rationale

Science is a body of knowledge built up through experimental testing of ideas. Science is also methodology, a practical way of finding reliable answers to questions we may ask about the world around us.

Science in our school aims to stimulate and excite pupils' curiosity about phenomena and events in the world around them. It proves to satisfy curiosity with knowledge. Science links direct practical experience with ideas and it engages learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modeling. This is a spur to creative thought. Through science, pupils understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving the quality of life. Pupils recognise the cultural significance of science and trace its world-wide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.

Teaching and Learning of Science

Content of the Curriculum

Science is a core subject in the National Curriculum. The fundamental skills, knowledge and concepts of the subjects are currently set out in the Science Programmes of Study from the National Curriculum.

1. Working scientifically is described separately in the programme of study, but will be taught through and clearly related to the science content in the programme of study. This will be embedded within the content of biology, chemistry and physics.
2. Pupils at our school will be taught to use a variety of approaches to answer relevant scientific questions. The types of enquiry will include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing
3. Spoken language will be developed through science, and children will be assisted in making their thinking clear to themselves and others.

Science in the EYFS

Within the Early Years Foundation Stage, Science is delivered through the area of Understanding the World. The children work towards the Early Learning Goals as set out in the EYFS through continuous provision. In EYFS at Woodchurch C of E Primary School, Science is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

During their time in F2, 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, feeling dough or listening to sounds in the environment. They will make observations of animals and plants and explain why some things occur and talk about changes when going on a nature walk. Children will be encouraged to ask questions about why things happen and how things work. They will do activities exploring simple chemistry, such as changes of state when looking at melting and freezing. Children will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings.

Their knowledge and understanding is also developed through enriching and widening their vocabulary through a wide selection of stories, rhymes and non-fiction texts, which also reflects our diverse world.

As a result of their valuable foundation within EYFS, children will enter Year 1 with a wide range of vocabulary to describe natural and man-made phenomena around them, will have had extensive opportunities to play with and explore a range of different materials, plants, animals and seasonal conditions, and will have developed a sense of curiosity, respect and affection for the natural world.

Planning and Delivery

Planning

Planning in science is a process in which all teachers are involved to ensure that the school delivers full coverage of the current National Curriculum and Foundation stage.

To allow for full coverage of the curriculum and good levels of progression within scientific skill, it is recommended that:

- Key Stage 2 plan for 2 hours of science per week
- Key Stage 1 and Foundation 2 plan for 1 ½ hours of science per week
- Teachers should try to make cross-curricular links wherever possible.
- Technology should be integrated into planning when possible, including use of laptops, data loggers and database software.

Long Term Science Plan

The whole school yearly science plan is based on the National Curriculum programme of study for each key stage that provides a basis for termly and weekly planning. The National Curriculum programme of study for science shows that Key Stage 1 have 4 units of work to complete; Key Stage 2 have 5 units of work to complete. This is reflected in the Woodchurch C of E Primary School long term plan. To maximise learning experiences and retention of knowledge, some units may be started in one term, and revisited in another. This is particularly prevalent when looking at plants to allow children a full experience in the observation over time when looking at the growth of plants.

Planning Scheme- Medium Term Planning

The science scheme of work for Woodchurch C of E has been specially written for the school by the science subject leader to:

- ensure full coverage of the science curriculum
- provide full exposure to all working scientifically skills and scientific enquiry
- address all areas learnt within subject leader CPD
- address the findings from national research, most recently, the 'Finding the Optimum' report from OFSTED.

Lessons have been planned with non-subject specialists in mind incorporating use of high-quality documents for support in the delivery of science., including ASE PLAN materials, Tigtag/ TigTag Jr and Explorify.

Assessment materials are taken from Headstart Primary Assessments: the appropriate topic test is to be administered at the end of each unit to identify levels of substantive knowledge. Disciplinary knowledge is to be assessed through ongoing assessment during science lessons, with staff completing tracking documents to assist in making a final judgement in each child's scientific level at the end of the school year.

Within this personalised scheme of work, the units provided allow the successful and accurate delivery of the full Primary Science Curriculum for England to be administered and ensures that the entire programme of study is covered. Our scheme of work ensures progression of knowledge and skills between year groups and guarantees topics, when revisited, are done so at appropriate levels and challenge. The learning objectives from the units are methodically planned into a weekly plan that shows progression of understanding in both substantive and disciplinary knowledge.

Lesson Structure

The lessons provided in our unique scheme of work follow the 'Woodchurch Lesson', involving a 'Can I still?' retrieval style starter, introduction and application of new learning and an 'Exit Task' reflection.

The purpose of the retrieval starter is to recap and embed prior learning, ranging from the previous lesson to previous year groups. These activities may include formal recording in book, practical group work, or take place as an oracy-based activity.

Once prior learning has been revisited and any misconceptions have been addressed, the children are then provided with an introduction to new content of learning which will allow for practise and development of skills within working scientifically, and given opportunities throughout the school year to access all areas of scientific enquiry: identifying, classifying and grouping; research using secondary sources; observation over time; pattern seeking and comparative and fair testing.

Each lesson will end with an 'exit task' style activity to allow children to reflect on the learning of that lesson, which will also provide valuable assessment opportunities for the teaching staff. Based on the outcomes of the exit task, teaching staff may need to adapt future retrieval tasks to reflect any misconceptions, and to make amendments to future lessons to ensure full understanding of concepts are made for all learners.

For every unit covered, children will be made aware of a particular scientist pertinent to the area of study. Scientists have been carefully chosen to allow for a broad development within the science culture capital, with a study of historical scientists, modern scientists and scientists from a diverse range of backgrounds across the school year

Even though the science curriculum at Woodchurch C of E Primary School has been carefully thought out and planned to be inclusive of all learners, teachers are encouraged to use their best judgement of their understanding of the children within their class, making adaptations where necessary. Teaching staff are also encouraged to make best use of any support staff and the resources available so the children can have more creative, memorable and inspiring science lessons at Woodchurch C of E Primary School.

Short Term Plan

Due to the in-depth nature of the medium-term plans, short term planning is not required from staff. In place of this, staff are encouraged to make continuous evaluation of the progress that their learners are making, and to adapt future lessons as necessary to address any areas for concern. Annotation of planning (either by hand or digital editing of plans) will represent this use of professional judgement to ensure that their learners are getting the best science learning possible by having their needs met.

Lesson Delivery

The science curriculum is delivered through collaborative group work, individual work, and whole class teaching.

Within this structure there will be:

- Whole class and group discussions and presentations.
- Demonstrations, explanations and instruction by teachers to groups, individuals and the whole class as well as child-led when possible.
- Practical activities to advance and consolidate knowledge and skills.
- Problem solving and investigation tasks.
- Opportunities to embed and rehearse oracy skills.

To allow for knowledge to be learnt and progression seen across the school, science sessions will include the Woodchurch Lesson three-part format, including:

- An entry task to review prior knowledge.
- Main concept to build on and progress in understanding of the context being taught.
- A consolidation task to complete the lesson, allowing children to identify the progress that they have made during this lesson.

Computing in Science

Science provides plentiful opportunities to allow children to develop their use of computing, such as:

- Being given the opportunity to research, plan, predict, test and improve their ideas using relevant computing resources to improve understanding, aid communication and enhance presentation.
- Computing provides various opportunities to investigate and to interpret results (e.g. Concept Cartoons, Data loggers, the Internet, databases, graphs, see-saw etc)
- The use of ICT helps to develop more independence and can provide an excellent extension and challenge for more talented pupils, whilst supporting others where necessary.

Assessment

Formative Assessment

Teachers use formative assessment to plan lessons that build on individual pupils' prior knowledge and provide feedback that genuinely helps pupils to improve their work in science. In Early Years Foundation Stage, KS1 and KS2 assessment in science is ongoing; observations from a lesson will inform next steps in planning.

Pupil's work should be marked in line with the Marking Policy and should model how corrections should be made, giving children a chance to learn from their misconceptions or incorrect methods. At the beginning of each lesson, time should be given for pupils to reflect on marking and comments on the previous work.

Summative Assessment

Substantive Knowledge Assessment:

Children's subject knowledge, understanding and level of competence within the substantive knowledge for each unit of study are assessed and recorded onto an online progression tracker using the Headstart Assessment materials. Children will be identified as working towards expected standard (ES), working at ES and working above ES. There are no official statements for working at a GDS level in science from the DFE. Those who are considered working above ES, are done so using the data from the

Headstart Primary Assessment materials. At the end of the school year, each class will be noted as to how many children are working below, towards or at ES.

Teacher judgements for end of unit summative assessments will be made based on the National Curriculum objectives for the unit of work that was covered. Evidence is collected throughout the unit and can include: work samples, photographs, observations, discussions with children, notes of children's thoughts and ideas, labelled diagrams and written recording.

Once judgments have been made for each child, these will be uploaded onto the Headstart Primary Assessment excel spreadsheet a whole unit has been completed. This data can then be easily accessed by end of Key Stage classes to identify levels of achievement in these subject areas.

Disciplinary Knowledge Assessment

Disciplinary knowledge is to be assessed through ongoing assessment during science lessons. Staff are to complete an ongoing tracking system, either digitally or on printed copies to demonstrate coverage of disciplinary skills and enquiry types, noting levels of success of children within these. When making a final judgement in each child's scientific level at the end of the school year, staff should not only base this on Headstart Assessment Topic/ Progress tests alone, as disciplinary assessments need to inform their overall judgement.

End of Key Stage Assessment

The formal assessment of science at the end of KS1 and KS2 takes place in accordance with the national statutory requirements. The teachers in Year 2 and Year 6 will assess children's level of attainment at the end of KS1 and KS2 based on the objectives within the current teacher assessment framework. This is a teacher assessment based upon assessment records, observation and work samples. There will also be records of achievement in all subject areas from previous year groups by accessing the online assessment tracking tool on the active learn platform.

Management and Development

Subject Leadership and Monitoring

Science education throughout the school is led by a science leader who will monitor the effectiveness of science in school. The Science leader is responsible for the development of science in school. The role entails monitoring of science in our school through a balanced program of monitoring strategies, including but not limited to: work scrutiny, learning walks, staff voice, pupil voice. The objective of the monitoring is to ensure science is being taught well across the school. The science leader is also responsible for review and analysis of data, recognising where support is required as appropriate. The updating and monitoring of school resources in addition to giving support to colleagues as appropriate is another part of the subject leader's role in science. The leader provides or organises staff training to disseminate new information.

Science and inclusion

Science forms part of the school curriculum policy to provide a broad and balanced education to all children. At Woodchurch C of E, we work to ensure that all children have the opportunity to gain scientific knowledge and understanding regardless of gender, race, and class, physical or intellectual ability. We ensure that expectations do not limit pupils' achievements and that assessments do not involve any cultural, social, and linguistic or gender bias. Through our science teaching we provide learning opportunities that enable all pupils to make good progress.

Promotion and Celebration of Science

Science is a subject which naturally provides opportunities to develop a child's sense of awe and wonder. This should be promoted within science lessons and beyond, including:

- School visits for science are organised where possible in line with the current unit of work, to enhance and extend learning.
- Local resources, such as scientists from industry are used to support units of work where possible.
- Participation in local, national and global events, such as British Science Week.
- Science displays in classrooms and around the school will celebrate children's work and evidence progression.
- Optional whole school science at home activities.

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 we manage the 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.

Resources

Physical science resources are located in the upstairs intervention classroom and are encouraged to be used to enhance learning opportunities. All staff will have access to the Woodchurch C of E planning from the Staff Drive or through the Science Google Drive file, and Headstart Primary Assessment resources. Staff are responsible for informing the science subject leader when extra resources are needed and when there are breakages. The science subject leader will update and replenish resources when needed.

Health and Safety

Safe practice must be promoted at all times. All children are made aware of the importance and relevance of health and safety when undertaking work in science. In planning, the class teacher is expected to assess the risks and adjust their lessons accordingly to ensure safe practice and appropriate levels of supervision. The CLEAPSS website is an excellent source of information and advice about minimizing risk in science teaching.

The ASE publication, 'Be Safe!' will be available for staff to take into account any health and safety and child protection issues, particular attention must be given to avoiding the use of anything which aggravates individual pupils' allergies. Risk assessments are carried out to ensure safety issues have been identified and that specific attention is paid when activities are unusual and beyond the scope of normal safety practice.

Review Date

The Woodchurch C.E. Primary School Primary School science policy is to be reviewed at least every two years by the Science subject leader. Policy was reviewed in December 2023 by new Science Subject Leader. The next review is due July 2025.