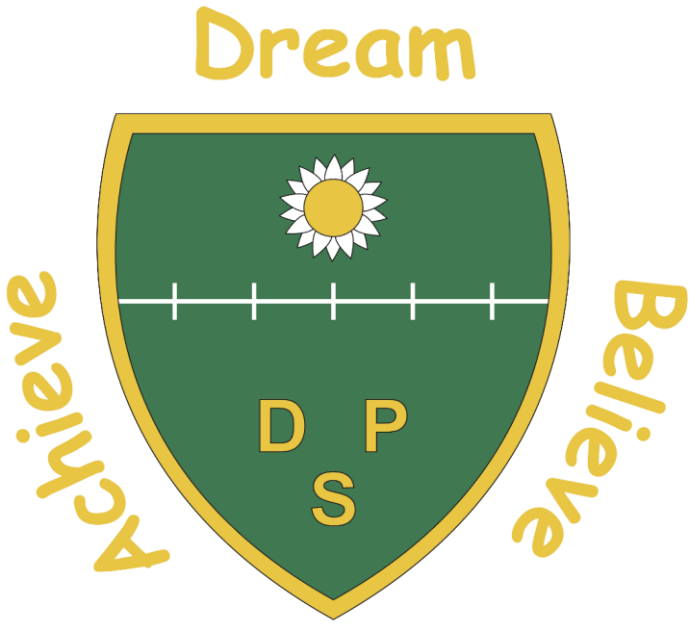
Daisyfield Primary School



Science Policy

September 2022

Intent

At Daisyfield Primary School we believe that a high-quality science education provides our children with the tools to understand the world around them. Developments in science have changed the world over and over again, and will continue to do so in the future. We believe that our children should be taught about the role that science has played in these advancements and the importance of science in the development of our future.

At Daisyfield, we aim to ensure that all pupils:

Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics (National Curriculum 2014). It is important the children at Daisyfield develop a secure understanding of each block of knowledge, before progressing to the next stage. The children will be able to demonstrate their understanding through use of technical terminology and specialist vocabulary. They will be able to collect, present and analyse data, applying their understanding of mathematics, and link their data with their understanding.

Develop understanding of the nature, process and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them (National Curriculum 2014). "Working scientifically" specifies the understanding of the nature, processes and methods of science for each year group. This skill will be embedded within the Daisyfield curriculum, enabling the children to understand how the different types of scientific enquiry (pattern seeking, identifying, classifying and grouping, comparative and fair testing [controlled investigations] and researching using secondary sources) can be used to answer relevant scientific questions.

Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future (National Curriculum 2014). We want the children at Daisyfield to be able to apply their scientific knowledge to their daily life and understand how it has been and is used to develop and understand the world that we live in. The children will have opportunities to learn about key scientific developments from history and the people who made these discoveries, reflecting the diverse scientific community and knowing that anyone can be a scientist.

Implementation

At Daisyfield Primary School, we aim to create a positive attitude towards science learning and an expectation that all pupils are capable of achieving high standards in science. This will be done through weekly teaching of Science to ensure that it is a regular aspect of the children's lives.

We will include problem solving opportunities within our science units to enable the children to apply their "working scientifically" skills and apply their understanding to ensure this is secure before they progress onto the next block. It also gives us the opportunity to embed these skills in the children, developing them into confident scientists.

We understand the importance of the Early Years Stage (Understanding the World) and make sure that our work in KS1 builds on the skills the children have gained already – this is then continued through LKS2 and into UKS2. As the children's knowledge and understanding increases, they will become increasingly confident in their ability to come to appropriate scientific conclusions.

There will be regular opportunities for the children to use scientific equipment, and for the children to choose equipment they think will be appropriate for their investigations. Teachers will find

opportunities to develop the children's understanding through outdoor learning (Daisyfield Bucket School) and a wide range of visits, trips and visitors to complement and broaden the curriculum.

We will celebrate events such as British Science Week and provide opportunities for the acquisition and application of knowledge and skills.

Impact

The successful approach at Daisyfield primary 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 (through Daisyfield Bucket School and other opportunities). Frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum through 'Essential Learning Experiences'. 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, as a result of our community links and connection with national agencies, such as the STEM association and I'm a Scientist Get Me Out of Here!, ensuring that children 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. Through pupil conferencing it is clear that children at Daisyfield Primary School overwhelmingly enjoy science and this results in motivated learners with sound scientific understanding.

Aims

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.

At Daisyfield Primary School we aim to:

- To use a cross curricular approach whereby children are seeing links to science in other areas of the curriculum in particular the STEM subjects. 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 be given opportunities to use their scientific skills and research to discover the answers.
- 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.

- 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.

Curriculum

As a school, we use PZAZ scheme of work, and other suitable resources to supplement the curriculum, to support our science planning whilst ensuring that we meet statutory requirements of the National Curriculum. Our curriculum has been arranged to fit with our mixed-age group classes.

Science is taught through working scientifically (involving practical investigation, observation and application skills, enquiry and research) alongside specific taught subject knowledge.

The science units build upon prior knowledge and provide opportunities for children of all abilities to develop their skills so that the children are increasingly challenged as they move up through the school.

We are developing a "Daisyfield Bucket School" curriculum to run alongside our lessons in order to enhance the children's learning and provide them with more opportunities to interact with the natural world.

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.
- Our 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.

Working scientifically

'Working scientifically' is outlined on each key stage curriculum document and 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.

- 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 Daisyfield Primary School our 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 through discussion with adults and their peers
- Keu vocabulary linked to each set of learning objectives is provided to the Teachers as part of our Daisyfield Curriculum documents.

Recording in Science

The way in which Science is recorded will vary across the school depending on age and ability. Teachers should ensure that a range of appropriate methods are used. These may include:

- Written accounts including: instructions, reports and explanations
- Diagrams, drawings and pictures
- Annotated diagrams
- Spreadsheets (data collection)
- Charts, graphs and tables
- Model making

Foundation Stage

- We teach science in reception classes as an integral part of the topic work covered during the year. As the reception class is part of the Foundation Stage of the National Curriculum, we relate the scientific aspects of the children's work 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 the objective in the ELGs of developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water. Science is also developed and monitored through continuous and enhanced provision during daily activities.

Assessment

Assessment for Learning

Children's progress is continually assessed and monitored throughout their time at Daisyfield Primary 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.

- Every teacher is encouraged to develop a breadth of evidence relating to children's achievements. These could include: the children's science book, models, notes and assessment sheets used by the teacher, and electronic examples of children's learning (e.g. video, graphs, their own concept cartoons, etc).
- Children receive effective feedback through teacher assessment, both orally and through written feedback.
- 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.
- At the end of each unit, key vocabulary and retention of key knowledge should be assessed through a short quiz or end of unit assessment.
- Teachers should regularly come back to key terms and knowledge throughout the year to ensure the children are learning and remembering more over time.
- 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.

Special Educational Needs

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.
- Teachers will use the school's inclusion planning key to 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.

More Able and Talented

At Daisyfield we identify our More Able and Talented children using our Daisyfield Assessments. We outline those working "Above" given objectives. We meet the needs of these children by planning for specific questioning opportunities which require Higher Order Thinking Skills.

In Science, we have identified the following characteristics for children who are deemed as "most able":

- They are interested in the world around them and learning more about themselves.
- They ask questions and are willing to hypothesise and ask "What if...?"
- They consider alternative strategies and suggestions for investigations.
- They are able to analyse data and spot patterns easily.
- They can make connections quickly between facts and concepts they have learned and use a wide variety of vocabulary.

Monitoring

The science subject leader has specially-allocated time for fulfilling the vital tasks, here are the tasks;

- A termly check that every class has covered the aspects of science as indicated in the long-term plan.
- Monitoring the effectiveness of Science teaching and learning by means of lesson observation (deep dives), pupil interviews, learning walks, sampling children's work to identify areas of strength and where learning can be better developed in the future.
- The science leader will identify aspects of teachers' practice that require developing and will help to provide the necessary support for this to happen.
- Provide feedback to teaching staff and the headteacher by providing an action plan and reviewing action plans in which evaluates the strengths and weaknesses in science and indicates areas for further improvement. This is reviewed termly.
- The science leader will monitor the use of science resources (equipment, IT, written materials, people, places and spaces) throughout the year and ensure that there are adequate amounts of resources, and that all of these are stored in a manner that makes them easily accessible to all.
- The science leader will support colleagues with identifying ways to enrich the coverage of the science learning. This could include visits, visitors and competitions and by keeping informed about current developments in science and providing a strategic lead and direction for this subject.
- Attend subject leader network meetings and disseminate new information
- Report to the Curriculum Committee of the Governing Body as requested.

Review date: September 2024