

Dean Field School

Science Policy



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K Lopuszniak	July 2020	July 2021
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Introduction

This policy outlines the teaching, organisation and management of science taught at Dean Field Community Primary School. At Dean Field we aim to give all children a strong understanding of the world around them whilst acquiring certain skills and knowledge to help them to think scientifically.

The school's policy for science is based on the Primary Curriculum, which has been statutory since September 2014. The implementation of this policy is the responsibility of all teaching staff.

Intent

At Dean Field Community Primary School, we believe it is important for our pupils to have a strong understanding of the world around them through stimulating and engaging lessons. Our young scientists will acquire life-long enquiry science skills, in order to explore and understand the world they live in, alongside the vast knowledge of the disciplines of biology, physics and chemistry. They will also develop an understanding of the vital role that major scientific ideas and scientists have played in society. In doing so, all our children, regardless of their starting points, will be fully prepared for their next stage of science education, and beyond.

Science at Dean Field is taught discretely, with a focus on substantive knowledge-rich content and the development of essential disciplinary knowledge. The curriculum is full adhered to the National Curriculum programmes of study and Early Years Foundation Stage framework with the focus of a knowledge-rich content. Science is taught throughout both key stages with some topics being revisited in later year groups to enhance their understanding. Within these topics, scientific enquiry skills are embedded to help children retain the information, increase their understanding and build on their prior knowledge they already have. Children are encouraged to become independent learners through the use of skills such as, observing, investigating and questioning when exploring scientific based problems.

We believe it is important for our pupils to have a strong understanding of the world around them through stimulating and engaging lessons. We encourage the children to work scientifically whilst using a range of specific skills to deepen their understanding of the science curriculum. Our curriculum encourages children to be curious about the natural phenomena and to be excited by the process of understanding the world around them.

As a school, we provide the children with a scientific vocabulary sheet at the beginning of each topic to introduce them to the key vocabulary they will need to understand. We also plan engaging lessons, trips and visits to encourage challenge and progression for the children. Our science curriculum is planned to ensure the children have a love for science whilst making good or better progress. This is monitored through half termly assessments, target tracker, science days and pupil interviews, which reflects our aim to achieve well in science.

Implementation:

Planning

At Dean Field teachers plan lessons around the National Curriculum objectives to build-up skills in each year group by building on previous learning. If all content is taught appropriately for each year groups, the children will build on this as they move through school.

The subject leader provides a long-term plan overview of the topics that should be taught and when. These topics are selected to match other curriculum areas to encourage cross-curricular links where possible so these skills can be applied to other areas of the curriculum.

To support our science teaching in school, teachers produce 'Must Knows' to help children understand key facts and vocabulary linked to their science topic. Each teacher plans a vocabulary lesson at the beginning of the topic to expose the children to vocabulary linked to the topic so they are familiar with the terms and to reduce barriers within lessons. Where appropriate, children will have their own 'My Must Knows' to ensure they have retained knowledge and skills at a secure level before moving on too quickly and having gaps in their learning.

Science lessons are planned using a skill-based approach to ensure that the children are acquiring new skills whilst working scientifically throughout every science topic. Teachers liaise with other teachers and colleagues to ensure prior knowledge is drawn upon and used as a foundation for future learning.

With thoughtful planning, teachers integrate science and English to enhance the learning in both areas e.g. writing at length by writing scientific investigations. We activate student's prior knowledge to develop new or more complex skills and acquire knowledge of a new subject.

Teacher's link the teaching of mathematical skills in science e.g. using their recording skills to present scientific enquiry through the use of reading, writing and interpreting graphs.

Children have access to iPads within the classroom to integrate computing in to their lessons to enhance scientific learning and enquiry.

Children begin all science books with a presentation policy to encourage the consistency of presentation and handwriting linked to their English curriculum.

All our curriculum topics are carefully planned to encourage cross-curricular links within science in all year groups.

We plan various experiences to develop their skills in the curriculum area to prepare them for the real world. We also take advantage of any opportunities to visit our local community or wider community to see what is happening around us.

Staff meetings and informal professional discussions across the trust are used to develop the science curriculum and to ensure consistency of knowledge, skills, approach, and of standards.

In the EYFS, science long term plans start in Nursery and sequence specific knowledge and skills embedded into engaging topics to benefit the children's knowledge and understanding in science and prepare them for a deep understanding further up school. The long term plans then continue right up until year 6.

In the EYFS, scientific aspects of the children's work are related to the objectives set out in the Early Learning Goals (ELGs), as outlined in Development Matters. By providing learning opportunities throughout the EYFS academic years children will develop the skills in the above areas to make them 'curriculum ready' for science when they enter Year One. In EYFS teachers ensure they plan to specifically support the area 'Understanding the World' as this has the greatest link to the subject science.

In EYFS, each half-term is planned after analysing the Gap Strength Analysis from the term before to see what gaps need plugging to ensure every child makes sufficient progress. Experience based play is then planned to support children meeting these statements before they leave the EYFS, ensuring they have the foundation skills to progress through the subject in Years 1-6.

Teaching

The science curriculum is delivered by class teachers. In all classes, work is differentiated to challenge every child to match their own needs. Children work in a range of groupings including whole class, small groups, pairs and independently. Where appropriate, children are supported by teaching assistants.

The majority of science work is completed in green exercise books along with tasks completed on Seesaw. All work shared on Seesaw is saved in the 'Science Folder'. You can also find science learning on our website in the tab title 'Science'.

EYFS

In early years' science, the teachers will begin to develop the children's knowledge and skills that they will build on throughout their school years, such as developing their skills of observation, exploring, prediction, critical thinking and discussion about the world around them.

This is directly linked to the EYFS framework 'Knowledge and understanding of the world'. Children explore creatures, people, plants and objects in their natural environments. They will be encouraged to ask questions about why things happen and how things work.

The children will also explore and respond to a variety of sensory experiences by collecting a variety of materials.

Key Stage 1:

The teaching of science in Key Stage 1 is to build on their prior knowledge to develop their experience and understanding of themselves and their environment. They should be encouraged to be curious and ask questions about what they notice. They should 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. They should begin 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 should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Lower Key Stage 2:

The teaching of science in lower key stage 2 is to build on their prior knowledge to broaden their scientific view of the world around them. They should 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. They should 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.

Upper Key Stage 2:

The teaching of science in upper key stage 2 is to build on their prior knowledge to develop a deeper understanding of a wide range of scientific ideas. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin 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.

Health and Safety

Pupils will be taught to use scientific equipment safely when using it during practical activities. Teachers, teaching assistants and the subject leader will check equipment regularly and report any damage, taking defective equipment out of action.

All staff will refer to current safety practises, regulations and safeguarding requirements.

Working Scientifically:

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group and is taught and developed through practical elements in lessons. Scientific enquiry includes: 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.

Scientific Language

The quality and variety of language that pupils hear and speak are developed through modelling from class teachers.

At the start of a new topic, teachers teach a dictation lesson to introduce new scientific vocabulary so children can begin to build on prior vocabulary learnt and address any misconceptions.

The children should use scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Teachers ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions. They are encouraged to be curious and ask questions about what they notice. They are 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.

Resources:

All Science resources are stored centrally in the Science/Humanities cupboard in 'Topic' boxes. Within the allocated budget for science, resources will be renewed, updated and increased to enable staff to maintain a comprehensive range of learning experiences.

It is the science leaders' responsibility to check all equipment is maintained to a safe standard and organised accordingly. It is the responsibility of all staff to ensure that equipment borrowed is treated with respect and returned correctly with care.

Inclusion:

Each child will be allowed the same opportunities, regardless of ethnic group, age, gender and ability, social circumstances or special educational needs (SEN) in the development of their scientific education to make the greatest progress possible.

Where children have significant needs, they may be taught and assessed against BSquared objectives, in-line with their specific requirements. These are then reflected in 'My Must Knows' if needed.

We will identify which pupils or groups are under achieving in science and take steps to improve their attainment such as interventions or catch-up sessions where necessary.

The science lead purchased the Chris Quigley's Greater Depth resource to provide teachers with challenges and greater depth questions for each topic within each year group. These are provided for each class teacher to use when providing next steps and challenges at all levels.

Able pupils are identified through teacher observations or Sonar and challenged to their full ability in every science lesson. We ensure this by provoking questions, setting challenging work and providing extension tasks, encouraging learners to conduct independent research and pose their own questions.

It is our aim that a wide range of activities will be planned and organised that will stimulate our pupils' interests and instil a love for science.

All children will have equal access to resources.

Monitoring

All teachers are responsible for monitoring their year group for Science. They will assess children's work by monitoring the children within the lesson and supporting or challenging them where necessary.

On completion of work, the teacher marks and assesses the work and uses this to inform future planning. Written or verbal feedback is given to the child to help guide their progress. Children are encouraged to judge their own work and assess themselves against the objectives. The teacher uses all of this information to determine whether a catch up session or intervention is needed before the next lesson.

The science leader is responsible for improving the standards of teaching and learning in science by auditing and supporting colleagues in continuing professional development (CPD) whilst attending science related training to pass on to other staff members and develop own CPD as a leader.

The science lead monitors progress in science through lesson observations, book scrutinies, learning walks, pupil interviews and discussions with staff.

Impact

Assessment and Feedback

Assessment for learning is continuous throughout the planning, teaching and learning cycle. Each child has their own science book, where work is recorded and a science folder on their seesaw page.

Children throughout the school are also assessed using the strategies below:

- Observation of children working scientifically:
- Observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources.
- Questioning, talking and listening to children
- Considering work, materials or investigations produced by children together with discussion about this with them.
- Sigma Science test linked to their topic
- Must knows for children to peer assess

All of these assessment methods are combined to give the teacher an overall judgment.

All teachers use Sonar to monitor the progression in science. They update the science objectives each half term to monitor the children and provide immediate intervention.

Teachers use their observations, science books, sigma tests and teacher judgments to decide whether children are beginning, within, at or working above for each science objective. Then each half term teachers are expected to use this information to give the children an overall judgement for that year group.

This gives teachers an overall view to focus on gaps in children's learning therefore children will be split into smaller focus groups for science lessons. This will help ensure children have a good understanding of the entire science curriculum for their year group.

At the end of the year a teacher assessment judgement is made based on the whole year. This will also benefit the next teacher, as they will know exactly where the children are and what their gaps are.

Work in science is marked to show whether the objective for the lesson has been achieved or not. The amount of support given is also indicated on each piece of work.

Feedback to pupils about their progress in science is achieved through verbal feedback and through marking (See marking policy for more detail).

Effective monitoring is often done while a task is being carried out through discussion between children and teacher. This can be recorded as a speech sample or VF in science books.

It is expected that children will produce pieces of high quality writing through their science curriculum. When this happens, it is to be recorded in their science books and marked in line with the English marking policy.

In EYFS, they assess the children using Sonar against the statements. Each half-term is planned after analysing the Gap Strength Analysis from the term before to

see what gaps need plugging to ensure every child makes sufficient progress. Children are assessed in meeting the ELG in each area. If they are secure in Expected, they can be assessed in achieving Exceeding.