



**Cranbrook
Primary School**

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“Our children today our future tomorrow”

Science Policy

Written May 2020

Subject overview

Intent

At Cranbrook Primary, our Science curriculum is aimed at increasing pupils' knowledge and understanding of the world, equipping them with confidence and skills to make decisions to be lifelong learners, ready for the ever changing world around them. We aim to widen our children's horizons and develop their aspirations, allowing them to be scientists of the future.

We equip our children with scientific knowledge through carefully planned and exciting Science opportunities, which allow them to learn independently, think critically and self-evaluate. Children use different types of scientific enquiry types to answer their own questions, including observing changes over time, noticing patterns and grouping and classifying. We also encourage outdoor learning where possible by using the sensory and roof gardens at Cranbrook.

At Cranbrook Primary School, Science teaching offers children a wide range of skills within the classroom by using practical experiments, exposing them to different teaching methods using ICT and scientific equipment. It also allows them the freedom to lead their own learning and draw conclusions for themselves. Furthermore they develop their communication skills by learning and using technical vocabulary when presenting to their peers. Our Science curriculum also offers experiences beyond the classroom by using links with universities, industry and local high schools. These experiences build on the learning that the children acquire within the classroom and build an enriched Science curriculum, inspiring all.

Aims and Objectives

We at Cranbrook Primary School aim to provide a clear overview of science provision within the school that enables all children to enquire, explore, and observe so that they can ask questions about themselves and their environment. By providing a consistent approach to science teaching and learning and assessment across the school we hope to stimulate our children's wonder and curiosity in finding out why things happen in the way they do and ask 'What if' questions. Teachers support children to appreciate the way science will affect their future on a personal, national and global level.

Our objectives in the teaching of science are to:

- Create a passion for learning science through practical work.
- Appreciate and understand the science that happens in our day-to-day lives.
- Encourage children to ask questions and recognise they can be answered in different ways.
- Develop science skills so that children acquire knowledge and understanding of life processes and living things, materials and their properties and physical processes.
- Ensure there is a clear learning journey and progression in scientific knowledge and skills throughout the school.
- Build children's confidence in understanding and using scientific terminology, facts and processes in discussions and explanation.
- Investigate collaboratively to make new discoveries using the outdoor environment, visits, experts, and ICT.
- Create learning experiences that are relevant, memorable and cross curricular.
- Understand the importance of a fair test and the role of different types of variables within an investigation.

- Encourage children to be critical, independent thinkers and to lead their learning, ask questions and develop their sense of curiosity.
- Promote under-represented contributions to STEM and to allow children to believe that with dedication and effort, anybody can be a scientist.
- Emphasise and clarify that not all predictions are correct and finding errors makes us better scientists.
- Acknowledge, value and support the diverse cultural and linguistic backgrounds of all children through science.

School Curriculum - Programme of Study

EYFS

Science in EYFS is taught through the Development Matters learning objectives. These activities are practical in nature and encourage learning through first hand experiences. Teachers plan opportunities for the following experiences:

1. *Shows interest in play with sounds*
2. *Can talk about things they have observed, e.g. plants and animals*
3. *Natural and found objects*
4. *Talks about why things happen and how things work*
5. *Developing an understanding of growth*
6. *Growth, decay and changes over time*
7. *Shows care and concern over living things and the environment*
8. *Looks closely at similarities and differences*
9. *Patterns and change*
10. *Experiments with different ways of moving*
11. *Uses simple tools to effect changes to materials*
12. *Observes the effects of the activity on their bodies*
13. *Understand need to eat a varied diet and a healthy range of food*
14. *Show understanding of good practice with regard to health e.g. exercise, eating, sleeping, hygiene*

Teachers in EYFS make ongoing observations of children and record dialogue, photographs as evidence of work

Key Stage 1 & 2

The Programmes of study for Science are set out year by year for Key Stages 1 and 2 in the new National Curriculum (2014). The programmes of study describe a sequence of knowledge and concepts. Skills for **‘Working Scientifically’** are taught alongside each of units. The curriculum aims to ensure that all pupils:

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

Key Stage 1

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. 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.

‘Working scientifically’ is described separately in the programme of study, but must always be taught through and clearly related to the teaching of 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.

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

Lower Key Stage 2

The principal focus of science teaching in lower key stage 2 is to enable pupils 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.

‘Working scientifically’ is described separately at the beginning of the programme of study, but 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.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Upper Key Stage 2

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should 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 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.

‘Working and thinking scientifically’ is described separately at the beginning of the programme of study, but 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.

Pupils should read, spell and pronounce scientific vocabulary correctly.

Science Curriculum Planning

Science is a core subject in the National Curriculum, we use the objectives from the National Curriculum 2014 Programmes of Study scheme as the basis for implementing the statutory requirements for science. The Early Years Foundation stage use guidance from the Development Matters document.

We carry out the curriculum planning in Science in three phases (long-term, medium term and short-term). We use objectives from the National Curriculum and supporting documents such as Chris Quigley's 'Essential Skills', this gives a detailed outline of what we teach in the long term. Our medium-term science plans, give an overview of skills and enquiry questions taught by each year group and outlines the coverage and progression. They ensure an appropriate balance and distribution of work across each term. These plans are routinely reviewed by subject leaders.

Planning for each lesson is created collaboratively by teachers and year groups, to ensure that all children experience similar activities. The planning document and the planning for the lessons are personalised by each teacher and is also annotated by teachers so that the work is appropriate to the children's capabilities and relevant differentiation is in place. Supplementary activities and materials are also used in class to support the requirements of the national Curriculum.

Teaching and Learning

A variety of teaching styles are used to teach science. The main focus is to provide practical and investigative activities that enable the children to develop their knowledge, understanding and skills through first-hand experience. These are some examples of how science is taught at Cranbrook Primary:

- Whole class teaching.
- Enquiry based open ended and structured activities.
- Discussion between pupils and teacher.
- The opportunity to use a variety of data such as statistics, graphs, pictures and photographs.
- Use of ICT to enhance learning, including data loggers, temperature probes, iPads.
- Role play and drama.
- Presenting reports and PowerPoints to the rest of the class or in sharing assemblies.
- Carrying out practical experiments and analysing the results.

Because children have widely different scientific abilities, we ensure that we provide suitable learning opportunities for all children by;

- Setting common tasks which are open ended and can have a variety of responses.
- Setting tasks of increasing difficulty.
- Grouping children by ability in the room and setting different tasks for each ability group.
- Providing resources of different complexity, matched to the ability of the child.
- Using classroom assistants to support the work of individual children or groups of children.
- Where appropriate plan sessions with support teachers to support children with special educational needs or who speak English as an additional language.

Working scientifically and teaching skills

The teaching of science enquiry should help develop the following key scientific skills of enquiry:-

- Asking questions and recognising they can be answered in different ways
- **Planning, and carrying out 5 enquiry types, including researching, observing, sorting and classifying, pattern seeking, fair testing or comparative testing**
- Hypothesising and predicting
- Using equipment safely and correctly
- Measuring, gather, record and present data in a variety of ways including use of ICT
- Evaluating results and drawing conclusions, repeat tests and ask follow up questions.

Cross curricular

Reading, writing, maths and ICT skills are further developed in science. British Value links are made with other subjects when relevant, as well as part of the topic. Strong Mathematics links are made often in practical ways for example: classifying, counting, measuring, weighing, calculating, estimating and recording in tables and graphs. Students are encouraged to articulate and communicate their thoughts, ideas and theories through reading, writing, speak and listening during their science lessons. In addition to this their ICT skills and knowledge are also put to use when they measure, record, present and interpret data where appropriate. The use of the internet, data loggers, temperature probes and various apps enable our children to experience practical, interactive lessons.

By working in groups and teams, their social skills and interactions are also developed especially when problem solving. We make an effort to ensure that our children realise that science is a result of global human endeavour, imagination and creativity. We believe that it is important that they acknowledge that individuals and collaborations from across the world have independently and collectively made huge advances that have influenced the progress of science. Furthermore, in order to encourage our children to be responsible citizens we teach our children about environmental and sustainability issues impacting on the global world and what we can do to help save our planet.

Enrichment activities

The school makes every effort to support gifted and talented pupils e.g. through borough science quiz competitions, Science Week projects and lunch time activities. Children are encouraged to take part in a gardening club, making use of the schools outdoor provision. Furthermore, trips and visits are planned in each term with a science focus or as a stimulus for science back in the classroom. The subject leader is responsible for organising international science events in the school to raise the profile of the subject and bring the science in the news to the classroom e.g. solar eclipse or a rocket launch and Science week.

Science and Inclusion

At our Cranbrook Primary, we teach mathematics 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 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 use personalised teaching and learning to achieve this.

Resources

The science resources are centrally located in the staff rom room cupboard labelled science resources. Staff are advised to sign out resources and return them immediately after use. The subject leader is responsible

for ordering new resources to meet the demands of the new curriculum and take responsibility of the science allocated budget.

Outdoor Provision

Staff are encouraged to maximise learning using the outdoor provision. They make strong links with outdoor learning areas, including the pond, sensory garden and adventure playground. There is a strong emphasis of using the outdoors to make observations over time e.g. with seasons, weather and plant topics.

Assessment

During the course of the year, teachers will monitor, keep ongoing observations and notes regarding the children's progress. They will also use books, feedback and marking, and discussion with pupils to make judgements. AfL is used as an informal short term assessment procedure to check children's understanding and lessons are adjusted to reflect this. Teachers use target tracker as a planning tool and to help regularly assess their children; this is completed every half term or after they have finished teaching a unit.

KS1 and KS2 submit an overall science result to the borough using teacher assessment. Parents are informed of assessments and progress in the annual end of year reports for all children in the school.

Marking and Presentation

Teachers are expected to adhere to the school's marking policy when marking books, and the presentation policy when guiding children as to how to present their work. Next steps should be given and children should have sufficient time to respond to these to progress their learning.

Monitoring and Evaluation

The Science subject leader, alongside the Senior Leadership Team are responsible for monitoring and evaluating curriculum progress. This is done through book scrutiny, planning scrutiny, lesson observations, pupil interviews, staff discussions and audit of resources.

Health and Safety

Risk assessments for enquiry based learning are written, updated by the subject leader and verified by the health and safety designated member of staff. In addition to using the ASE guidelines for safety, our school also has access to the CLEAPSS health and safety documents which are detailed and specific to the unit you are teaching. All teachers are required to read (personalise to class) and disseminate health and safety guidelines to relevant adults and children before the task takes place. Teachers are responsible of knowing the correct protocol for children with IEP, behaviour plans, SEN needs and other allergies or medical needs. Adult child ratios to outdoor areas (pond) must be followed.

Review

The Science policy will be continuously updated and reflected upon in our practice throughout the school year.