At Ellison Primary Academy, we recognise the importance of Science in every aspect of daily life. As one of the core subjects taught in Primary Schools, we understand how it underpins all of the basic knowledge about the world around us and therefore is vitally important to our children's development; understanding the world through the specific disciplines of biology, chemistry and physics through BIG questions they want to find the answers to. The Scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with Science as a process of enquiry. Through half termly units, we aim to develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence. Children will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. During lessons, the children will be immersed in scientific vocabulary, which will aid their knowledge and understanding, not only of the unit they are studying, but of the world around them. We aim to ensure that every child engages with Science which they will be encouraged to relate to their own personal general knowledge and want to share therefore building a positive relationship that they will develop throughout their education. As our vision states 'Science at Ellison feeds our children's inquisitive questions with an insight into how and why things are as they are. It encourages them to explore concepts independently, taking risks and experimenting with their ideas'.

Aims and objectives

At Ellison Primary Academy we believe that all children are entitled to a broad and balanced Curriculum which is interesting, engaging and provides a range of learning opportunities that help develop children's life-long love of learning. We do this through a concept-based curriculum that has been designed to ensure that these are returned to by every year group and therefore is embedded throughout each subject.

In essence, the Curriculum aims to:

- Increase children's motivation, enthusiasm and engagement in their learning by making learning meaningful through putting it into a context,
- Support the raising of standards in both teaching and learning,

- Help children to become more independent and take greater ownership of their learning, developing their confidence and motivation to learn through the use of a range of teaching and learning styles,
- Establish strong cross curricular links to ensure a broader understanding,
- Create and maintain an exciting and stimulating learning environment,
- Provide opportunities to apply knowledge and learning in practical ways and to solve problems in a variety of situations,
- Provide enrichment opportunities where learning and teaching can take place beyond the classroom,
- Give opportunity for a flexible timetabling approach to make space for true depth of study.

1.1 Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national, and global level.

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1.2 The aims of science are to enable children to:

- ask and answer scientific questions;
- plan and carry out scientific investigations, using equipment, including computers, correctly;
- know and understand the life processes of living things;
- know and understand the physical processes of materials, electricity, light, sound and natural forces;
- know about the nature of the solar system, including the earth;
- evaluate evidence and present their conclusions clearly and accurately.

2 Teaching and learning style

2.1 We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's knowledge, skills, and understanding through the use of key concepts that are returned to by every year group. Sometimes we do this through

whole-class teaching, while at other times we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer, the BIG scientific questions to encourage independent learning and thinking. They have the opportunity to use a variety of data, such as statistics, graphs, pictures, and photographs. They use computing in science lessons where it enhances their learning. They take part in roleplay and discussions and they present reports to the rest of the class. They engage in a wide variety of problem-solving activities. Wherever possible, we involve the pupils in 'real' scientific activities, for example, researching a local environmental problem or carrying out a practical experiment and analysing the results.

2.2 We recognise that there are children of widely different scientific abilities in all classes and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways by:

2.2.1 setting common tasks which are open-ended and can have a variety of responses;

2.2.2 setting tasks of increasing difficulty as Bronze, Silver and Gold tasks for each child to choose. This encourages the children to set the learning to their ability and confidence and provides a challenge

2.2.3 providing resources of different complexity, matched to the ability of the child;

2.2.4 using classroom assistants to support the work of individual children or groups of children.

3 Science curriculum planning

3.1 The school uses a concept-based curriculum for science as the basis of its curriculum planning and uses the key objectives of the National Curriculum and Chris Quigley milestones for assessment and to ensure the objectives are taught. Key concepts have been designed so that they are returned to by every year group and these are embedded throughout the children's lives at Ellison. This has been adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork and we choose a locality where the physical environment differs from that which predominates in our immediate surroundings.

3.2 We carry out our curriculum planning in science in three phases (long-term, medium-term and short-term). The long-term plan maps the scientific topics studied in each term during the key stage. The science subject leader works this out in conjunction with teaching colleagues in each year group. In some cases, we combine the scientific study with work in other subject areas, especially at Key Stage 1; at other times the children study science as a discrete subject.

3.3 Our medium-term plans, which we have based on the national curriculum and Chris Quigley milestones, give details of each unit of work for each term. The science subject leader keeps and reviews these plans.

3.4 The class teacher is responsible for writing the lesson plans for each lesson. These are based on the specific learning objectives of each lesson and involve differentiated success criteria. The class teacher keeps these individual plans, and s/he and the science subject leader often discuss them on an informal basis.

3.5 We have planned the topics in science so that they build upon prior learning. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit and we also build progression into the science scheme of work, so that the children are increasingly challenged as they move up through the school.

4 Foundation Stage

4.1 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.

5 The contribution of science to teaching in other curriculum areas

5.1 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 English are of a scientific nature. The children develop oral skills in science lessons through discussions (for example 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.

5.2 Mathematics

Science contributes to the teaching of mathematics in a number of ways. The children use weights and measures and learn to use and apply number. Through working on investigations they learn to estimate and predict and develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions.

5.3 Information and communication technology (Computing)

Children use Computing in science lessons where appropriate. They use it to support their work in science by learning how to find, select, and analyse information on the WWW. Children use Computing to record, present and interpret data and to review, modify and evaluate their work and improve its presentation.

5.4 Personal, social and health education (PSHE) and citizenship

Science makes a significant contribution to the teaching of personal, social and health education. 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 people recycle material and how environments are changed for better or worse. Secondly, children benefit from the nature of the subject in that it gives them opportunities to take part in debates and discussions. They organise campaigns on matters of concern to them, such as helping the poor or homeless. Science promotes the concept of positive citizenship.

5.5 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.

6 Teaching science to children with special educational needs

6.1 At our school we teach science to all children, whatever their ability. 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 progress. We do this by setting suitable learning challenges and responding to each child's different needs. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels.

6.2 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. This ensures that our teaching is matched to the child's needs.

6.3Intervention through School Action and EHC will lead to the creation of an Individual Education Plan (IEP) for children with special educational needs.

6.4 The IEP may include, as appropriate, specific targets relating to science.

6.5 We enable pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom, for example, 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.

6.6 Our curriculum ensures that all lessons are accessible for all children with Special Educational Needs and Disabilities. Through carefully chosen learning and differentiation when required, lessons are designed to ensure that any barriers to learning are reduced, and all pupils can progress. Children with particular needs are specifically planned for within science lessons so that their targets are considered across the curriculum. Learning is scaffolded to ensure children are given the correct challenge within lessons with scaffolding removed as their understanding develops. Suitable challenge is also ensured through the use of challenge questions which are designed to link to the key concepts built within the curriculum.

7 Assessment and recording

7.1 We assess children's work in science by making informal judgements as we observe them during lessons. Through intervention marking, the teacher marks the work and comments as necessary and uses the school's feedback policy to enable the children to amend and improve their work. Challenges are also set to ensure the objective and understanding is embedded. At the end of a unit of work s/he makes a summary judgement about the work of each pupil in relation to the National Curriculum level of attainment and records this against the Chris Quigley milestones by assessing whether the child is above, on track, working towards or pre-year group. We use these grades as the basis for assessing the progress of each child and we pass this information on to the next teacher at the end of the year.

7.2 Children take the national tests in science at the end of Key Stage 2. Teachers make an assessment of the children's work in science at the end of Key Stage 1. We report these results to parents along with the teacher assessments which we make whilst observing the work of children throughout the year. We use practice science tests in Key Stage 2 to assess children's progress on an annual basis.

7.3 The science subject leader keeps samples of children's work in a portfolio and uses these to demonstrate what the expected level of achievement is in science for each age group in the school.

8 Resources

8.1 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 and computer software to support children's individual research.

9 Monitoring and review

9.1 It is the responsibility of the science subject leader to monitor the standards of children's work and the quality of teaching in science. The science subject leader is also responsible for supporting colleagues in the teaching of science, for being lead and direction for the subject in the school. The science subject leader gives the Head teacher an annual summary report in which s/he evaluates strengths and weaknesses in the subject and indicates areas for further improvement. The science subject leader has specially-allocated time for fulfilling the vital task of reviewing samples of children's work and visiting classes to observe teaching in the subject.

Signed:

Date:

Head teacher:

Date: