KINETON GREEN PRIMARY SCHOOL

SCIENCE POLICY

June 2019

Revise (June 2022)

Contents

1) Our Rationale for teaching Science

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 is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills.

At Kineton Green, we believe that a broad and balanced science education is the entitlement of all children, regardless of ethnic origin, gender, class, aptitude or disability.

Our aims in teaching science include the following:

- To stimulate and excite pupils' curiosity and develop their interest in, and knowledge of, phenomena and events of the world around them
- To offer a range of activities which can engage all learners by linking direct practical experience with ideas, encouraging critical and creative thinking.
- Preparing our children for life in an increasingly scientific and technological world.
- Fostering concern about, and active care for, our environment.
- Helping our children acquire a growing understanding of scientific ideas.
- Helping develop and extend our children's scientific concept of their world.
- Developing our children's understanding of the international and collaborative nature of science.

Attitudes:

- Encouraging the development of positive attitudes to science.
- Building on our children's natural curiosity and developing a scientific approach to problems.
- Encouraging open-mindedness, self-assessment, perseverance and responsibility.
- Building our children's self-confidence to enable them to work independently.
- Developing our children's social skills to work cooperatively with others.
- Providing our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

Skills:

- Giving our children an understanding of scientific processes.
- Helping our children to acquire practical scientific skills.
- Developing the skills of investigation - including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Developing the use of scientific language, recording and techniques.
- Developing the use of ICT in investigating and recording.
- Enabling our children to become effective communicators of scientific ideas, facts and data.

1.2) How Science Promotes the School's Mission Statement and Values

At Kineton Green we value honesty, encourage responsibility and respect each member of the community and the world around us. Our community is one where learning can take place and all can achieve success.

In our teaching of Science we aim to :-

- widen each child's experience, knowledge and understanding of the world by helping pupils develop lively, enquiring minds; encouraging them to engage in questioning and discussion about Science-based issues which affect their lives, the society in which they live and the world as a whole. Children learn how technologies based on Science have been used in industry, business and medicine, and how these developments have contributed greatly to the quality of life for most people

- develop an independent approach to personal needs and learning whilst acquiring self confidence and self-discipline, through expressing views and evaluating decisions about Science related matters

- encourage co-operation, sensitivity and tolerance of each other by a practical approach to activities within the classroom.

- encourage parents to take an active part in the process of investigation and learning.

Our school values, the 5 Bees, underpin all teaching and learning at Kineton Green, and encourage children to:

- Be a Lifelong Learner
- Be Safe and Healthy
- Be Confident
- Be Respectful
- Be Trustworthy and Honest

2. Teaching and Learning in science

2.1 The Place of Science in the Curriculum

Science is a National Curriculum Core Subject.

The programmes of study for science are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. Within each key stage, schools have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage if appropriate. The school science lead formed part of a local authority working party to develop the scheme of work staff follow throughout each year. Through this process, decisions were made to include some physics content into the Key Stage 1 curriculum as it was found to be very biology heavy.

In Foundation Key Stage, specific Science teaching and exploration is planned in as part of the area of learning called 'Understanding of the World'. In this area of learning, pupils are developing the crucial knowledge, skills and understanding that help them to make sense of the world. This forms the foundation for later work in Science, as well as other subjects, such as geography and ICT. The area if learning gives pupils opportunities to solve problems, make decisions, experiment, predict, plan and question in a variety of contexts and to explore and find out about their environment, people and places that have significance in their lives.

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.

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.

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.

Crucially, throughout each unit of work, children have planned opportunities to use a range of practical scientific methods, processes and skills. This 'Working Scientifically' criteria is outlined in the National Curriculum for each year group.

By the end of each key stage, pupils will be expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. During the year staff will regularly complete assessments as to whether the children are working towards, have met, or exceeded these objectives.

2.2 Science structure in school

Science is taught as part of the integrated curriculum throughout the Foundation Stage. Teachers may choose to block periods of time within a term to teach units of work where this will benefit teaching and learning. They will also seek opportunities to make cross curricular links (Cornerstones).

The school uses the Cornerstones Creative Curriculum to plan exciting and thorough learning opportunities for pupils. There is a different theme or topic every half term and science will be linked through these where possible. The Science lead has created medium term plans using the National curriculum objectives for each year group. Therefore, ensuring progressions between year groups and those topics are revisited and built upon. Within each unit, there is a wealth of practical investigations teachers can use with their pupils to educate them.

2.3 Planning in Science

Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of the National Curriculum for Science and science in the Foundation stage. When planning, we aim to incorporate as much practical scientific enquiry into our lessons as possible. Opportunities for cross-curricular skills are built in and taken advantage of (see section 2.5) meaning that skills and knowledge are developed and supported at other times. Science teaching in the school is about excellence and enjoyment and teachers are expected to adapt and modify plans to suit their children's interests, current events, their own teaching style, the use of any support staff and the resources available.

Units of work for each year group have been planned around Cornerstones topics. However, staff are able to teach objectives when they like throughout the year, providing they plan to teach all objectives for these units of work across the year.

Ongoing assessment against learning objectives for year groups are completed using Classroom Monitor and should be used to inform planning across the year. Records are kept to support future class teachers in planning.

Weekly short-term planning and classroom organisation are the responsibility of class teachers, working in consultation with the subject leader and other members of staff where necessary. Short term planning identifies use of ICT and resources (including teaching assistants) and identifies health and safety risks and any precautions that are taken. Teachers should indicate appropriate differentiation for their cohort to ensure all pupils are challenged and can access learning. This may include differentiating tasks, differentiating expectations within a task, differentiating resources, accommodating different learning styles or differentiating the type of questioning within a lesson.

A lesson learning objective along with a success criteria should always be shared with the pupils and achievements reviewed in the plenary.

2.4 Feedback and Assessment

We use assessment to inform and develop our teaching.

Assessments are made in a variety of ways, which include pupils drawing, writing and discussion as well as the teacher's observation of their practical skills and attitudes.

We assess for learning (AfL). Children are involved in the process of self-improvement, recognising their achievements and that of their peers and acknowledging where they could improve. Activities during, and at the end of, each topic record achievement and celebrate success. For example, children at Key Stage 2 might self-mark completed work with 'three stars and a wish' - identifying three good points in their work and one in which they could improve.

When discussing and marking pupils' work we do so positively, endeavouring to ensure that any teacher comments are also linked to the identified WILF. We make it clear verbally, or on paper, where the work is good, and how it could be further improved. Teachers can identify success criteria in a pupil's work by highlighting it in green and identify any misconceptions in yellow. It is expected that a teacher addresses any misconceptions with the child, either verbally or via a written comment, as soon as possible.

To ensure that the quality of literacy is considered when marking pupil work, staff are asked to regularly use 'pink for think', picking up on scientific spelling errors or grammatical errors within a piece of writing.

At the end of each unit of work, teachers assess a child's progress against year group objectives for what has been taught. They will identify whether a child is 'beginning', 'developing', 'secure' or 'exceeding' within each objective. This information can be used by the subject co-ordinator and year group teacher to inform future planning to ensure progression of all children.

Teachers are expected to keep a record of the progress of 3 benchmark children (of differentiated ability) up to date throughout the year. Regular moderation of science work occurs regularly within both the school and within the local authority to ensure there is consistency in science assessment across the key stages.

Verbal reports are given at parents evening during autumn and spring terms and written reports are made at the end of an academic year, describing each child's attitude to science, his/her progress in scientific enquiry and understanding of the content of science. The school science coordinator monitors the teaching and learning of science across the school through a range of activities that include sampling children's work at regular intervals, taking learning walks around the school, reviewing teacher planning and teacher assessments.

2.5 Cross Curricular Links

<table>
<tr>
<td>Examples of link to Numeracy

• measuring and use of equipment
• recording data in tables
• identifying patterns in data
• using units of measure
• developing graphical skills</td>
<td>Examples of links to Literacy

• asking questions
• explaining processes
• recording observations
• reading non-fiction texts
• vocabulary extension
• developing speaking and listening skills
• labelling techniques</td>
</tr>
<tr>
<td>Examples of links to ICT

• software packages to present information
• sensors to detect and record sound, light or temperature levels
• CD- Rom or Multimedia package to view things that cannot readily be observed
• database or spreadsheet to analyse data
• branching database to develop and use keys
• simulation software
• Internet, CD-Rom to research</td>
<td>Examples of links to PSHE

• local environment
• growth and development
• names of parts of the body
• harmful substances
• developing a healthy and safer lifestyle
• topical issues</td>
</tr>
<tr>
<td colspan="2">Links to other National Curriculum subjects include such examples as :-

• P.E. - the human body and how it works

• Music - sound aspects

• Geography - global issues

- the environment
- weather

• History - changes in technology, medicine etc
- understanding of people and events of the past

• R.E. - religious festivals
- light

• D.T. - enhancing problem solving skills
- forces and friction
- electricity

• Art - colour and light
- creative skills
- raising questions</td>
</tr>
</table>

3. Resources

Practical resources for Science are stored in a central area. Books and media resources are catalogued and stored in the library. All resources are sorted into units and clearly labelled.

4. Equal Opportunities

Science is taught within the guidelines of the school's equal-opportunities policy.

- We ensure that all our children have the opportunity to gain science knowledge and understanding regardless of gender, race, class, physical or intellectual ability.
- Our expectations do not limit pupil achievement and assessment does not involve cultural, social, linguistic or gender bias.
- We aim to teach science in a broad global and historical context, using the widest possible perspective and including the contributions of people of many different backgrounds.
- We draw examples from other cultures, recognising that simple technology may be superior to complex solutions.
- We value science as a vehicle for the development of language skills, and we encourage our children to talk constructively about their science experiences.
- In our teaching, science is closely linked with literacy and mathematics.
- We recognise the particular importance of first-hand experience for motivating children with learning difficulties.
- We recognise that science may strongly engage our gifted and talented children, and we aim to challenge and extend them.
- We exploit science's special contribution to children's developing creativity; we develop this by asking and encouraging challenging questions and encouraging original thinking.

We have particular regard for gender issues, aiming to dispel the myth of a scientist being a MAN in a white coat! Our resources reflect the diversity of the school, locality and nation.

5. Home/School Links

- A curriculum booklet or science overview for each year group is available on our school website. We invite support via specific artefacts, appropriate secondary sources of information and materials.

- Parents/carers are welcomed to support pupils within the classroom environment with practical investigations.

- Class link governors may be invited into the classroom to support with science activities.

- Curriculum evenings and weeks based on specific subject areas are a regular feature of school life.

- Homework is set when appropriate. Tasks are often research based.

- Children and parents are able to access scientific information and science websites recommended by the school to support learning at home via our school website.

- Pupils also have home access to Education City, an online resource which has many science activities for children.

Review

This policy is reviewed in line with the school's policy review programme, every three years.