



# Science Policy

At Thorndown, we value and respect everyone in our community and work as a team to:

- Provide learning experiences which support and inspire high achievement for all
- Ensure a caring, safe and welcoming environment
- Promote co-operative and responsible attitudes to make a positive contribution
- Actively encourage independence and confidence to thrive in a changing world

*"Happy, Healthy, High Achievers"*

**Approved at committee/GB meeting on: .....**

**Review Period: .....**

**Date for next review: .....**

# 1 Introduction

1.1 Science aims to excite children's natural curiosity also equip them to question and understand concepts and phenomena in the world. Through the teaching of skills, knowledge and understanding, pupils engage as scientists through practical experience and enrol on a journey that seeks to explain scientific issues on a personal, national and global scale.

Scientific knowledge, methods, uses and processes are taught through a combination of whole class, group teaching and individual work. Different learning styles are accommodated as children are engaged in investigations which promote co-operation, perseverance, open-mindedness and responsibilities. Children are presented with opportunities to develop observations skills, predict how they expect things to behave and analyse causes. Resources, wide variety of secondary sources such as our well stocked 'Discovery Suite' and access to technology all enhance and deepen learning experiences.

Whilst working scientifically, children are encouraged to raise questions to investigate; plan a fair scientific investigation; carry out activities safely, collect, present and interpret results in a variety of ways and finally evaluate their investigation. Science also contributes significantly to the teaching of other curriculum areas. It has a key role in English and Maths and is actively promoted by reading, writing, speaking and listening. Without the application of Maths; estimation, prediction, accurate observations, measurements and recording, interpreting results would not be possible.

At KS1 pupils observe, explore and ask questions about living things, materials and physical phenomena. They begin to work together to collect evidence to help them answer questions and to link this to simple scientific ideas. They begin to evaluate evidence and consider whether tests or comparisons are fair. They use reference materials to find out more about scientific ideas. They share ideas and communicate them using scientific language, drawings, charts and tables with the help of computers if it is appropriate.

At KS2 pupils learn about a wider range of living things, materials and physical phenomena. They make links between ideas and explain things using simple models and theories. They apply their knowledge and understanding of scientific ideas to familiar phenomena, everyday things and their personal health. They think about the effects of scientific and technological developments on the environment and in other contexts. They carry out more systematic investigations, working on their own and with others. They use a range of reference sources in their work. They talk about their work and its significance, using a wide range of scientific language, conventional diagrams, charts, graphs and computing to communicate their ideas.

## 1.2 The objectives of teaching science in our school are:

- To stimulate and excite children's curiosity and enthusiasm for science
- To help pupils to learn to question and discuss scientific issues that may affect their own lives
- To engage pupils as learners at many levels through linking ideas with practical experience and developing an ability to apply principles to new situations
- To present a variety of experiences to broaden, challenge and change children's ideas
- To develop understanding of key scientific ideas and show how they contribute to technological change and impact on improving the quality of our everyday lives
- To develop scientific vocabulary
- To help pupils develop, model and evaluate explanations through scientific methods of collecting evidence using critical and creative thought
- To encourage an appreciation of the need for good health and safety attitudes and actions

## 2 Teaching and Learning Style

2.1 We aim to foster positive attitudes through our science teaching. Children often approach Science topics with their own firmly held beliefs and their attitudes affect their willingness to take on new ideas and change old ones.

We aim to develop:

- Curiosity and an interest in exploration, posing questions and attempting to discover more.
- A respect for evidence.

- Open-mindedness and an awareness that there may be various explanations, different points of view and conflicting evidence.
- Perseverance, seeing a task through to its completion
- Creativity in producing ideas, questions and explanations
- Responsibility for their own actions and the ability to carry out tasks in a safety conscious manner
- Co-operation and collaboration with others in planning, investigating and communicating
- Independence in organisation and carrying out tasks

2.2 Planned activities aim to inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as "Why...?", "How...?" and "What happens if...?". Pupils have frequent opportunities to develop the skills of enquiry. They are encouraged to take responsibility for planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and deciding on the best form of communicating their findings.

### 2.3 **Special Educational Needs**

Primary science is particularly appropriate for children with learning difficulties as it often involves:

- Practical investigations which help develop physical control, practical manipulative and organisational skills
- Working in a group which helps skills and co-operation
- Learning how to think critically and objectively, reason systematically, assess evidence and make their own judgements
- Using and practising basic skills in a motivating and rewarding context
- 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:
  - Setting common tasks which are open-ended and can have a variety of responses
  - Setting tasks of increasing difficulty (- we do not expect all children to complete all tasks)
  - Grouping children by ability in the room and setting different tasks for each group as appropriate
  - Providing resources of different complexity, matched to the ability of the child, including writing frames
  - Using TA's and other adults to support the work of individual children or groups of children and taking into account the child's PLP

- Challenging able children. It may be appropriate to increase the breadth and or depth of study or facilitate a higher degree of independence in the management and organisation of more open-ended tasks.

### **3 Science Curriculum Planning**

- 3.1 The school uses the national curriculum for science as the basis for its planning.
- 3.2 We carry out our curriculum planning in two phases (long-term and medium-term). The long-term plan maps the scientific topics studied in each term, over a two year cycle for the mixed year groups.

In some cases we combine the scientific study with work in other subject areas, especially Key Stage 1. At other times the children study science as a discrete subject.

- 3.3 Our medium-term plans, which stem from the National Curriculum, give details of each unit of work for each term covering the statutory programmes of study including the Working Scientifically methods, processes and skills.
- 3.4 Where possible, planned units in science 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 Health and safety**

- 4.1 It is our priority to care for the children's health and safety at all times. Within the area of science, safety is particularly important whenever the children are handling equipment, especially tools or substances. The children will be taught to be aware of the dangers and to adapt their behaviour appropriately. They will be taught to use caution and be sensitive to possible dangers. Much of the science equipment is kept in the central store in the learning street.
- 4.2 We comply with the health and safety regulations and carry out risk assessments where necessary. Teachers have advice and guidance when referring to guidance leaflets published by CLEAPSS online and in the 'Be Safe' book held by the coordinator.

## **5 Early Years**

- 5.1** Science makes a significant contribution to the topic work covered during the year. The main body of skills and knowledge taught come under the area of 'Understanding the World'. The scientific aspects of the children's work are set out in the Early Learning Goals (ELG's). Activities are practically based and cross curricular.

## **6 The contribution of science to teaching in other curricular areas**

### **6.1 English**

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. The children develop verbal skills in science lessons through discussion and through recounting their observations of scientific investigations. They develop their writing skills through writing reports, recording observations and information.

### **6.2 Mathematics**

Science contributes to the teaching of mathematics in a variety 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. They develop the skills of accurate observation and recording events. They numbers in many of their answers and conclusions. They learn to look for and to describe patterns and to collect, display and interpret data.

### **6.3 Computing**

Children use ICT in science lessons where appropriate. At both key stages this involves the pupils using ICT to: locate and research information; record findings (using text, data and tables); log changes to the environment over time (data logging equipment).

### **6.4 Scientific cross curricular links also include:**

- PSHCE: drugs and alcohol, keeping healthy and life cycles including sex education
- Design and Technology: forces, electricity and materials
- Geography: environmental issues, rocks and soils, testing and recording
- Music: sound (- pitch, volume and vibrations)
- PE: the human body, forces

## **7 Spiritual, moral, social and cultural development**

7.1 Science provides opportunities to promote children's spiritual development in the natural world through exploration of questions on the origins and nature of life itself. Children may often feel a sense of awe and wonder as they discover and explore the natural and man-made world around them.

7.2 Moral questions that arise in science include those on the implications and uses of scientific knowledge, which can both be beneficial and harmful to mankind. There is also the requirement for scientific conclusions and claims to be based on close observations and firm evidence.

7.3 Social development within science is promoted by the need to form opinions and justify decisions based on experimental evidence.

7.4 Scientific discoveries and ideas have affected the way people think, feel, behave and live within a culture. Different cultures accept, use and value scientific ideas in different ways.

## **8 Entitlement**

All children will be taught the relevant units of work for science, in ways appropriate to their ability, regardless of gender, cultural background or physical impairment. Tasks, opportunities and activities will seek to reduce role distinctions between girls and boys.

## **9 Assessment and recording**

9.1 The pupils' knowledge and understanding are assessed at the beginning of each unit of work by questioning, discussion and observation.

We then assess children's ongoing work in science by making informal judgements as we observe them during lessons. On completion of written work, the teacher marks the work and any misconceptions or anomalies are indicated with a 'Blue Fish', in line with the school marking policy.

At the end of each unit Teacher assessment takes place and pupil targets covered by each teaching unit will be ticked off on individual pupil target cards. Trail- Teachers will then record for each unit taught whether a pupil has achieved age expectation, is working towards or above the aged related expected level.

Teachers submit a 'best fit' summative assessment on o'track at the end of each Term. Teachers analyse pupils' progress in the units of work they have completed at the end of each school year to complete the annual report to parents.

Assessment of 'Working Scientifically' relies on observation and/or the collection of written evidence of investigating skills. Specific assessment activities are carried out to gather evidence.

9.2 Assessment of the development of scientific skills within the area of 'Understanding the World' forms part of the Foundation Stage Profile.

9.3 We report children's progress to parents in the annual reports.

9.4 The subject leader will keep samples of children's work in a portfolio, and use these to demonstrate what the expected level of achievement is in science for each age group in the school.

## **10 Resources**

10.1 Science resources in the central store in the downstairs learning street. Measuring equipment is jointly shared with Maths and is stored at the end of the Science store. The library contains a good supply of science topic books. The data loggers are kept in the 'ICT cupboard' in the Discovery suite.

10.2 Pupils should be taught how to locate and replace resources properly in class. Teachers should make sensible decisions, based on the age and stage of pupils to whether pupils should, under the guidance of an adult, collect and replace resources from the central store.

## **11 Monitoring and review**

11.1 It is the responsibility of the science co-ordinator to monitor the standards of children's work and the quality of teaching in science. The subject leader is also responsible for supporting colleagues in the teaching of science, for being informed about current developments in the subject and for providing a strategic lead and direction for the subject in the school. The science subject leader gives informal feedback to team leaders and senior leaders. The head teacher and senior leaders can evaluate strengths and weaknesses in the subject and indicate further improvement. The subject leader is given allocated time for fulfilling the vital task of monitoring coverage, planning, teaching and learning in Science across the school including samples of planning, children's work, visiting classes to observe teaching in the subject.

Signed:

Date: