



Thornaby Church of England Primary School

Science Policy

The Importance of Science

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

(National Curriculum Sept 2013)

Definition of Science

Science is a body of knowledge, which is built up through experimental testing of ideas. Science is also a methodology, a practical way of finding reliable answers to questions we may ask about the world around us.

Rationale

The study of science is an essential part of the school curriculum. Through the science curriculum, children's entitlement to participate fully in science is realised and children will develop skills to explore and understand the world in which we live.

Good Primary Science should:-

- ✓ Involve children in learning experiences requiring their involvement in both practical and intellectual activities.
- ✓ Recognise that children arrive with different levels of language and experience and aim to provide appropriate experiences and support to enable them to develop scientifically.

- ✓ Be firmly based on children's first hand experiences and the sorting and classifying of these experiences in a reasoned and logical way.
- ✓ Start from the views which children hold and give them opportunities to change their views and ultimately increase their understanding.

Aims

- 1] To develop and extend our children's scientific concepts of their world.
- 2] To encourage the development of investigation, exploration, collaboration, observation, evaluation and inspiration.
- 3] To carry out planned safe practical activities.
- 4] To develop use of scientific language, recording and techniques.
- 5] To enable our children to become effective communicators of scientific ideas, facts and data.
- 6] To incorporate scientific activities, processes and skills with other areas of the curriculum.
- 7] To build up our children's scientific skills, knowledge and experiences, so that their knowledge and understanding is deepened and enriched as they progress through our school and through life.
- 8] To foster the development of positive attitudes to science.
- 9] To foster certain personal attitudes and qualities e.g. respect for the environment, a healthy lifestyle.

Equal Opportunities

Strategies must be adopted to ensure that all children have the opportunity to become scientific, regardless of gender, race, class, physical or intellectual ability.

Points to consider

- Am I promoting science equally to both sexes?
- Are the resources I am using attractive to all children and do they promote positive images?
- Do I provide support and ensure access for those children experiencing difficulties.
- Do I extend and stimulate those children who need to develop farther?
- Take care, when planning work to consider racial ethics especially in work about the body and food.
- Are the children discovering new things through hands-on practical work?

Science in the Foundation Stage

In the Early Years of education, children are developing the crucial knowledge, skills and understanding that help them make sense of the world.

To give our children the best opportunities to develop their scientific knowledge and understanding we must provide :-

- ❖ Activities based on first hand experiences that encourage investigation, exploration, observation, problem solving, prediction, critical thinking, decision making and discussion.
- ❖ An environment with a wide range of activities, indoors and outdoors that stimulate our children's interest and curiosity.

By the end of the Foundation Stage, our children will have been involved in :-

- ❖ Investigating objects and materials by using all their senses as appropriate.
- ❖ Finding out about and identifying some features of living things, objects and events they have observed
- ❖ Looking closely at similarities, differences, patterns and change.
- ❖ Asking questions about why things happen and how things work.

Science at Key Stage 1

During Key stage 1, pupils should :-

- ♣ Ask simple questions and recognise that they can be answered in different ways.
- ♣ Observe closely, using simple equipment.
- ♣ Perform simple tests.
- ♣ Identify and classifying.
- ♣ Use their observations and ideas to suggest answers to questions.
- ♣ Gather and recording data to help in answering questions.

Key Stage 1 Programmes of Study

In school science is currently taught through Cornerstones as part of topic work.

However, all the science objectives in the curriculum must be covered for every child within their 2-yearly cycle.

Therefore, if necessary, teaching should be supplemented by discrete lessons when and/if a teacher deems appropriate.

This extra teaching might be linked to the same objectives as a class's topic work to ensure thorough and proper coverage of Cornerstones content, or it might be on a completely different topic not covered by Cornerstones (see coverage checks for your year groups saved in science file on staff shared).

Science in Lower Key Stage 2

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- ♣ Asking relevant questions and using different types of scientific enquiries to answer them.
- ♣ Setting up simple practical enquiries, comparative and fair tests.
- ♣ Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- ♣ Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.
- ♣ Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- ♣ Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- ♣ Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- ♣ Identifying differences, similarities or changes related to simple scientific ideas and processes.
- ♣ Using straightforward scientific evidence to answer questions or to support their findings.

Science in Upper Key Stage 2

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- ♣ Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- ♣ Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- ♣ Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- ♣ Using test results to make predictions to set up further comparative and fair tests.
- ♣ Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
- ♣ Identifying scientific evidence that has been used to support or refute ideas or arguments.

Key Stage 2 Programmes of Study

Coverage of Curriculum Objectives

In school science is currently taught through Cornerstones as part of topic work.

However, all the science objectives in the curriculum must be covered for every child within their 2-yearly cycle.

Therefore, if necessary, teaching should be supplemented by discrete lessons when and/if a teacher deems appropriate.

This extra teaching might be linked to the same objectives as a class's topic work to ensure thorough and proper coverage of Cornerstones content, or it might be on a completely different topic not covered by Cornerstones (see coverage checks for your year groups saved in science file on staff shared).

Lower Key Stage 2 (Year 3-4)

- ♣ Animal including humans
- ♣ Plants
- ♣ Living things and their habitats
- ♣ Rocks
- ♣ Light
- ♣ Forces and magnets
- ♣ States of matter
- ♣ Sound
- ♣ Electricity.

Upper Key Stage 2 (Year 5-6)

- ♣ Animals including humans
- ♣ Evolution and inheritance
- ♣ Living things and their habitat
- ♣ Earth and space
- ♣ Light
- ♣ Forces
- ♣ Properties and changes of materials
- ♣ Electricity

Differentiation in Science

By differentiation, we mean the provision of work at different levels which will meet a wide range of children's needs and which will keep pace with their developing abilities.

Differentiation by task

1] By grouping the children according to ability and setting tasks appropriately.

2] By giving a variety of tasks related to a curriculum topic: providing more concrete experience and discussion for children who are slower to understand, whilst giving extension activities for those children who succeed quickly

Differentiation by outcome

1] By setting a task which is almost the same for the whole class, but providing a greater amount of support for the less able and giving more responsibility and challenge to the more able.

2] By using mixed ability groups and asking the children to plan and carry out practical work co-operatively, but then each child recording the work on their own. This provides opportunity for the teacher to assess what each child has learned.

Different approaches will be needed for different age groups and abilities.

Assessment and Record Keeping

Foundation Stage

Ongoing practitioner assessment by:

- ❖ Observation of children working.
- ❖ Discussion with children, before , during and after working.

Key Stage 1

- ❖ As for Foundation Stage
- ❖ Finding out activities.
- ❖ Looking at /marking children's work.
- ❖ Specific assessment tasks planned by the teacher.
- ❖ Assessment tasks at the end of each science topic.
- ❖ Children's progress recorded on science tracker in staff shared-assertive mentoring. When the relevant science objectives are taught (through topic work or discretely) the teacher will need to update the tracker, in the assertive mentoring file on staff shared, through teacher assessment of the objective (. Meaning can't do it, / meaning partially and X fully).

Key Stage 2

- ❖ As for Key Stage 1
- ❖ Written tests at the end of KS2.
- ❖ Aiming High ongoing assessment.
- ❖ Children's progress recorded on science tracker in staff shared-assertive mentoring. When the relevant science objectives are taught (through topic work or discretely) the teacher will need to update the tracker, in the assertive mentoring file on staff shared, through teacher assessment of the objective (. Meaning can't do it, / meaning partially and X fully).

Celebrations of Science success and display

It is important that children's success in science is acknowledge and celebrated appropriately. This can be done by interactive science work displays in classrooms, corridors etc. Each classroom should have an exploration/investigation table to promote children's individual science investigations.

Resources

- The vast majority of resources are stored centrally in the serving hatch in topic boxes
- Staff should impress on children the need for care and consideration when using resources.
- The contents of each box should be checked against the enclosed list before it's return
- Staff should notify the Science Leader of any extra resources required, of any losses or breakages which occur.

Health and Safety

- It is important that all staff are aware of the responsibility they have regarding health and safety both inside and outside the classroom. Staff need to take account of both the children's and their own health and safety when involved in scientific activities.
- If staff are unclear as to whether a material can be used in school, they should refer to the risk assessment and COSHH
- Further information on health and safety issues and safety points refer to:
 - 1] Science NC Document
 - 2] CLEAPPS booklets (in box file in the staffroom)

Science Co-ordinator October 2010

Reviewed October 2012

To be reviewed October 2014

Reviewed October 2014

Reviewed Jan 2016

Reviewed October 2016

To be reviewed October 2018