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Science Policy

2021-22

Version Control

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1. Introduction

The Trust intends and expects that all decisions around the use of Trust resources will be underpinned at all times by its vision and values:

Our aim:

To create centres of educational excellence that inspire all pupils to turn their potential into performance

To achieve this our schools will:

Provide a broad and balanced curriculum that allows pupils to develop their talents and ambitions

Deliver the highest quality learning opportunities facilitated by excellent teachers

Inspire our pupils to become confident, motivated and respectful individuals ready to make a positive contribution to society

The Trust will support our schools by:

Maximising the resources and expertise available to individual schools

Providing a platform for the sharing of excellent practice

Challenging and developing staff to turn their potential into performance

1.1. Aims and Scope

Success Criteria for this Policy:

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. At Red Oaks Primary School, science is about developing children's ideas and ways of working to enable them to make sense of the world in which they live through investigation, as well as using and applying skills.

Aims

The school's aims are to:

- Prepare our children for life in an increasingly scientific and technological world.
- Foster concern about, and active care for, our environment.
- Help our children acquire a growing understanding of scientific ideas.
- Help develop and extend our children's scientific concept of their world.
- Develop our children's understanding of the international and collaborative nature of science.

Attitudes

As a school, we aim to:

- Encourage the development of positive attitudes towards science.

- Build on our children's natural curiosity and develop a scientific approach to problems.
- Encourage open-mindedness, self-assessment, perseverance and responsibility.
- Provide 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.

The National Curriculum for Science 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.

Other linked Policies

- Maths policy
- Design and Technology policy
- SEN policy
- Inclusion policy

2. Policy Statement

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. At Red Oaks Primary School, science is about developing children's ideas and ways of working to enable them to make sense of the world in which they live through investigation, as well as using and applying skills.

2.1. Policy Terms

Teaching and Learning

Early Years

In the foundation stage, science comes under the umbrella of knowledge and understanding of the world. Children are taught to investigate objects, materials and living things using all their senses. Children are encouraged to ask questions about why things happen and how things work; to look closely at similarities, differences, patterns and change.

Key Stage One

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, however at Red Oaks it is **always** taught in context which directly relates to the teaching of science content.

Lower Key Stage Two

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 in the programme of study, however at Red Oaks it is **always** taught in context which directly relates to the teaching of science content.

Upper Key Stage Two

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 scientifically' is described separately in the programme of study, however at Red Oaks it is **always** taught in context which directly relates to the teaching of science content.

Pupils should read, spell and pronounce scientific vocabulary correctly.

Teaching and Learning Styles

Teaching and learning should ensure that scientific enquiry is taught through contexts taken from the three areas:

- Life processes and living things (Biology)
- Materials and their properties (Chemistry)
- Physical processes (Physics)

To support the planning of lessons, teachers will follow the National Curriculum, in conjunction with the Red Oaks scheme of work, to ensure all objectives are taught.

Key Stage Two will have access to resources on the TigTag website (www.tigtagworld.co.uk) to enhance their lessons but planning and activities should be adapted to suit individual classes and should not be based solely on TigTag. The Red Oaks ethos for teaching science is based on child led 'hands on' practical learning. Experiments and investigations should be at the heart of every science lesson. Concept cartoons should be used at the start of every science lesson as a form of recapping previous learning.

Teachers will follow the science curriculum overview for Red Oaks (see overview in curriculum) which outline topics of study, lesson objectives and relevant skills to support the learning. These skills are differentiated from year 1 to 6 to show clear progression of working scientifically.

Various methods and strategies are used for the teaching and learning of science at Red Oaks focussed around science enquiry. These focuses are as follows:

- **Pattern seeking** – identifying patterns and looking for relationships in enquiries where variables are difficult to control
- **Researching** – using secondary sources of information to answer scientific questions
- **Comparative and fair testing** – changing one variable to see its effects on another, whilst keeping all other the same
- **Identifying and classifying** – making observations to name, sort and organise items
- **Observation over time** – observe changes that occur over a period of time ranges from minutes to months

Skills

Children will practise skills throughout each unit. These will include opportunities to develop:

- Understanding of scientific processes.
- Practical scientific skills.
- The skills of investigation: observing, measuring, predicting, experimenting, communicating, interpreting, explaining and evaluating.
- The use of scientific language, recording and techniques.
- The use of ICT in investigating and recording.
- The ability to become effective communicators of scientific ideas.

The Learning Environment

The learning environment will enable the children to become independent learners, providing a comfortable atmosphere where children feel happy to take risks.

We recognise that all classes have children with widely differing scientific abilities. We provide suitable learning opportunities for all children by matching the challenge of the task to the ability and experience 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 different tasks for each ability group within the classroom.
- Providing resources of different complexity that are matched to the ability of the child.
- Using teaching assistants or communication support workers to support the work of individual children or groups of children.

Inclusion

We believe that all children have the right to access science lessons. In order to ensure that children with special educational needs achieve to the best of their ability, it may be necessary to adapt the delivery of the science curriculum for some pupils. This could involve using a multi-sensory approach.

We teach science to all children, whatever their ability. Science forms part of the National Curriculum to provide a broad and balanced education for all children. Through the teaching of science, we provide opportunities that enable all pupils to make progress. We do this by setting suitable challenges and responding to each child's individual needs.

Red Oaks is a Dyslexia Friendly School and all teachers are aware of the Dyslexia Friendly Schools guidelines. The school has also achieved the Inclusion Quality Mark.

3.0 Guidance and Procedures

Home / School Links

The importance of home/school links cannot be underestimated. Parents need to be encouraged to work with the school to support their children. Families must be supported to feel confident in approaching school. A range of activities are provided by Red Oaks to support the learning of science at home:

- Termly science challenges set on the website and class Dojo
- School scientists who will launch ideas, set challenge son the website and have email addresses for the children to contact them with questions to further their understanding
- School science weeks held on conjunction with the rest of TPAT schools
- Extra-curricular trip to the Royal Air Tattoo for gifted scientists across key stage two

The role of the Subject Leader

There is a science subject leader who is responsible for the implementation of science policy across the school. Their role is to:

- Offer help and support to all members of staff (including teaching assistants) in the teaching, planning and assessment of science.
- Provide colleagues opportunities to observe good practice in the teaching of science.
- Maintain resources and advise staff on the use of equipment and resources.
- Monitor classroom teaching or planning.
- Monitor the children's progression in science, looking at examples of work of different abilities.
- Keep up-to-date with new developments and communicate information developments with colleagues.
- Lead staff training on new initiatives.
- Attend appropriate in-service training.
- Have enthusiasm for science and encourage staff to share this enthusiasm.
- Keep parents and governors informed on the implementation of science in the school.

The role of the Class Teacher

Individual teachers will be responsible for ensuring that the pupils in their classes have opportunities for studying science and using their knowledge, skills and understanding of science across the curriculum.

They will plan and deliver the requirements of the National Curriculum for Science to the best of their ability. We set high expectations for our pupils and provide opportunities for all to achieve, including boys and girls, pupils with educational special needs, pupils with disabilities, pupils from all social and cultural backgrounds and those from diverse linguistic backgrounds.

The class teacher's role is a vital role in the development of science throughout the school and will ensure continued progression in learning and understanding and create effective learning environments.

The class teacher will also:

- Secure pupil motivation and engagement.
- Provide equality of opportunity using a range of teaching approaches and techniques.
- Use appropriate assessment techniques and approaches.
- Maintain up-to-date assessment records.

Learning Resources

Science resources are stored centrally in the book store. All resources should be returned to this location after they have been used.

An audit of resources will take place annually and purchases made when necessary and when funds are available.

Health and Safety

The school is aware of the health and safety issues involved in the children's use of scientific equipment. We will promote a safe working environment for the children by demonstrating the correct use of equipment and reinforcing this regularly. Please also refer to the Health and Safety policy for more guidance.

Assessment, Intervention, Data Collection and Analysis

Assessment and Record Keeping

Teachers regularly assess progress through observations and evidence. Key objectives to be assessed are taken from the National Curriculum and will be linked to the unit being taught during that term.

We assess the children's work in science by making informal judgements as we observe the children during lessons. In Key Stage One informal assessment will be completed as children complete units of work. Children's names are recorded on a record sheet to show whether they are working towards the standard, at the expected standard or exceeding the standard (GD) using the given assessment sheet. In Key Stage Two; once the children complete a unit of work, they will be assessed in an open-ended task where children are free to demonstrate what they know. This can be shown in a variety of ways including: diagrams, lists, drawings, prose etc. The teacher will then use the children's work to assess whether they are working towards the standard, at the expected standard or exceeding the standard (GD) using the given assessment sheet. The information will be recorded on an excel sheet against the child's name and lesson objective assessed. This is recorded as 1 (Little or no understanding) 2 (some understanding) 3 (secure) 4 (fully understood to a greater depth). Percentages as shown on the excel sheet for the children's understanding and the unit understanding. This informs future planning and any revisiting on units needed.

It will be the teacher's responsibility to ensure these sheets are kept up to date and ready for data analyses at the end of terms 2, 4, 6.

Also these sheets must be handed up to the next teacher to inform their use of concept cartoon and gaps in the previous year's learning and also to inform the end of key stage judgments.

As well as this, children in five and six will have exposure to different science assessment questions from Testbase. This is to ensure they are prepared for the end of Key Stage science assessment to Year 6.

Monitoring and Reviewing

The monitoring of the standards of the children's work and of the quality of teaching in science is the responsibility of the subject leader. The subject leader is also responsible for supporting colleagues in the teaching of science, for keeping informed about current developments in the subject and for providing a strategic lead and direction for the subject in the school. The subject leader will be responsible for carrying out the task of reviewing samples of the children's work through book scrutiny's, carrying out learning walks to observe teaching and conducting pupil interviews.

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