Rowdown Primary School
Science Policy

Our Rationale:

The teaching of Science is fundamental to preparing our children for life in an increasingly scientific and technological world. Our curriculum fosters concern about, and active care for, our environment. We help children to acquire a growing understanding of scientific ideas and to develop and extend their scientific concepts of their world. We aim to develop our pupil's understanding of the international and collaborative nature of science.

This policy details the guiding principles by which this school will implement Science as outlined in the National Curriculum 2014.

"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 in England: science programmes of study 'Purpose of Study.'

Furthermore Rowdown Primary School Science Policy reflects the importance of spoken language in pupils development as set out in the National Curriculum.

"The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions."

National curriculum in England

The school has a scheme of work to ensure a full coverage of the curriculum.

We believe that a broad and balanced science education is the entitlement of all children, regardless of ethnic origin, gender, class, aptitude or special educational need. Our aims in teaching Science include:

- Teaching science in ways that are imaginative, purposeful, well managed and enjoyable.
- Giving clear and accurate teacher explanations and offering skilful questioning.
- Making links between science and other subjects.
- Developing spoken language as a means to probe and remedy our children's misconceptions, in developing their scientific vocabulary, articulating their scientific ideas and in making their thoughts and ideas clear to others.

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.

Science Teaching at Rowdown:

The teaching of science should allow children as much first-hand experience as possible, be practical and grouped into 5 main types:

1. Investigations.
2. Illustrative activities.
3. Explore and discover activities.
4. Demonstrations/discussions.
5. Research.

1. Investigations

- Allow children to make their own observations in order to develop a love of science and to recognise that science contributes to all aspects of everyday life.
- Encourage children to make "I think this will happen because. . . . " statements which they can test.
- Allow children to work independently, planning how the investigation is to proceed and making decisions – what to change, what to measure or judge and what to keep the same.
- Allow children to select the most appropriate equipment and apparatus for an activity.
- Encourage questions for an investigation and allowing a variety of routes to a solution.
- Give children the opportunity to place their own interpretation on data and compare what happened with their prediction.

2. Illustrative Activities

This style of teaching deals with a specific concept or skill and can be teacher directed. Teacher directed activities may be a very useful way of introducing children to the skills involved in carrying out an investigation. It may include, at particular stages:

- Directing or leading pupils to what is to be observed.
- Advising pupils on approaches to an investigation and the appropriate equipment and measuring instruments to use.

- Prescribing the methods of recording and communicating.
- Specifying one route to the solution.
- Involving all pupils arriving at the same conclusion which illustrates the idea or concept under study.

3. Explore and Discovery Activities

The discovery learning method involves a practical activity that consolidates previously developed scientific skills and reinforces knowledge and understanding, but is not itself an investigation.

It may include:

- Involving the teacher in providing stimulus for the children to observe and explore at first hand.
- Asking questions that can be answered through observation and exploration. Use higher order questions and projects as extensions for gifted and talented pupils.
- Directing and leading children to what is to be explored.
- Involving teacher and children in discussing and comparing their findings and developing scientific ideas.
- Developing science informally through after school clubs and through membership of the British Association of Young Scientists.

4. Demonstration

Demonstration activities are a way of getting started or showing a particular skill or imparting knowledge.

The demonstration could be carried out by the teacher, visiting experts, or children. This may take place either in school or on an educational visit. The demonstration may take the form of a talk or an experiment to show a particular concept. Wherever possible, demonstration activities should be followed by practical work of the illustrative type.

5. Research

Research activities involve children in using a variety of secondary sources to develop and increase their scientific knowledge.

Possible secondary sources include people, books, databases, charts, photographs, pictures, historical records, videos and websites.

It will include:

- Involving children and teachers specifying questions to be researched.
- Involving the children in identifying relevant information.
- Involving the children in selecting and interpreting the relevant information.
- Involving the children in presenting the information for the appropriate audience.
- Linking science to other subjects. For example, looking at the scientific reasons why we need a healthy lifestyle (c/c PSHE).

How teaching is structured throughout the school:

On average, foundation, key stage one and key stage 2 pupils will receive one hour per week.

In the Foundation stage Science is taught through play and as an integral part of the topic work covered during the year. The EYFS strand 'Understanding the World' leads directly to scientific elements of the curriculum for Key Stage 1. Children must be supported in developing the

knowledge, skills and understanding that help them to make sense of the world. Their learning must be supported through offering opportunities for them to use a range of tools safely; encounter living things, people, plants and objects in their natural environments and in real-life situations; undertake practical 'experiments'; and work with a range of materials.

Recording in Science:

The way in which Science is recorded will vary across the school depending on age and ability. All Teaching Staff should ensure that a range of appropriate methods are used.

These may include:

- Written accounts including instructions, reports and explanations.
- Diagrams, drawings and pictures.
- Annotated diagrams.
- Spreadsheets (data collection)
- Charts, graphs and tables
- Model making
- Photographs.
- Shared discussions.

Assessment:

Teachers will assess the children's abilities in a variety of ways to ensure they gain a full understanding of what each child has learnt and what is needed to progress their understanding. Teachers will observe and provide written or oral feedback. At the end of each term Class Teachers will assess children's levels based on the Expected Standards. Assessments will be made on a 'best fit' basis and recorded as 'vulnerable', 'expected' and 'greater depth'. In addition, teacher assessments are recorded as part of KS1 and KS2 SAT's data which is reported to parents and the Local Authority.

Health and Safety:

At Rowdown Primary School children are encouraged to consider their own safety and the safety of others at all times. Safety measures are clearly explained and discussed with the children. Teachers provide a safe and secure environment for children to learn in.

Equipment and Resources:

There is a wide range of resources available to the school which will be maintained and monitored by the Science Coordinator. The resources are a collective responsibility for the whole school, and pupils are encouraged to treat resources carefully and safely. Children are expected where appropriate to choose their own equipment and set such equipment up for practical science. This should be done under adult supervision with health and safety requirements in mind. By doing so, they:

- Make sensible choices about which equipment to use.
- Treat the equipment with care.
- Use the equipment with their own and others' safety in mind.
- Become independent learners.

The school grounds and surrounding areas offer a great resource for staff and pupils and teaching staff are actively encouraged to seek opportunities to take the children's learning outdoors.

Inclusion:

As teachers we must be aware of, and respond to, pupils' diverse learning needs including those with English as an additional language, those with learning difficulties, and the Able, Gifted and Talented pupils. Teachers will identify gifted and talented, SEN and EAL pupils.

All children will have access to science. Therefore, work and activities will be differentiated accordingly to ensure that children of all abilities participate to their full potential. Consideration will be given to language, resources and equipment used.
(For further information see the Inclusion Policy.)

Leadership and Management Roles:

The Senior Leadership Team in cooperation with the Science Coordinator should:

- Ensure that all pupils can develop their understanding of the big ideas in science.
- Ensure that all pupils learn the skills needed to work like a scientist.
- Support staff to deliver an enquiry-rich curriculum with access to appropriate resources.
- Plan improvement that builds the school's Science Curriculum that raises Standards for pupils and that leads colleagues to teach Science effectively. This includes learning walks, moderating assessment, observing lessons, pupil voice and work scrutiny.
- Encourage the sharing of ideas between staff and organising in-service training as appropriate.
- Manage resources, ensuring they are readily available and maintained.
- Monitor teaching quality and pupil achievement.
- Coordinate assessment procedures and record keeping to ensure progression and development throughout the school.
- Lead staff meetings to share ideas and skills.
- Be enthusiastic about Science and demonstrate good practice.
- Bid for funding to maintain resources.