

**Ysgol Gynradd
CREIGIAU
PRIMARY SCHOOL**

SCIENCE POLICY

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1. **Science and its Place in the Curriculum**

The National Curriculum upholds the abilities to communicate, to relate science to everyday life and to explore our essential elements of an initial experience of science.

To implement the National Curriculum, the school intends that pupils should develop the intellectual practical skills that allow them to explore the world of science and to develop a fuller understanding of scientific phenomena and the procedures of scientific exploration and investigation.

It is also intended that where the opportunity arises, science is to be related to other areas of the Curriculum. The National Curriculum links Science with Mathematics and Language as the three “core subjects”; their interdependence is unquestionable. Science is unable to progress without the use of language and in return, the subject helps linguistic development through the need to make precise the language used. Science has a similar reciprocal relationship with Mathematics; mathematical methods are used in the learning and recording of some science and science is frequently applied in mathematics.

Likewise, where possible, cross-curricular links are drawn to the National Curriculum’s foundation subjects; in other words, primary science studies can be an integral part of good primary practice across the Curriculum. Where appropriate reference and visits will be made to the locality and surrounding areas to support Cwricwlwm Cymreig.

2. **Aims**

- a. The scientific aims of the school can be seen to lie closely with the underlying principles of Scientific Skills, Communication, Enquiry, Developing and Reflecting.

Pupils should develop the intellectual and practical skills that allow them to explore the world of science and to develop a fuller understanding of scientific phenomena and the procedure of scientific exploration and investigation.

This work should take place in the context of activities that require a progressively more systematic and quantified approach which draws upon an increasing knowledge and understanding of science.

- b. Throughout their study of science, children will develop and use a variety of communication skills and techniques

involved in obtaining, presenting and responding and reflecting to information.

- c. As pupils begin to develop maturity and gain increasing knowledge and understanding, they will be given the opportunity to develop awareness of the role and importance of science in everyday life.

3. Objectives.

Objectives should set precisely and clearly which skill opportunities children are expected to experience. The objectives for science are clearly set out in the document “Science in the National Curriculum in Wales”, published in 2008. This document contains provisions relating to the skills and range in science applicable to pupils in each of three Key Stages. The programmes of study provide the basis upon which teachers must plan the skills objectives against which pupil progress can be assessed.

In implementing the skills objectives of the science curriculum, the pupil should be engaged in situations that employ a number of basic science skills:

- a. Observation
- b. Sorting
- c. Questioning
- d. Predicting (Hypothesising)
- e. Measuring
- f. Testing
- g. Identify patterns
- h. Interpret results
- i. Draw conclusion
- j. Recording
- k. Communicating
- l. Reflecting

Obviously these skills will be employed where appropriate – but the school must be conscious of attaining an overall balance within the curriculum.

4. Curriculum Content.

The National Curriculum divides the period of compulsory education into 3 Key Stages. A range of levels is specified for each Key Stage.

In Science they are as follows: -

Key Stage	Year Groups	Pupils' Age
2	3 – 6	7 - 11
3	7 – 9	11 - 14
4	10 – 11	14 - 16

It is expected that the attainment of the great majority of pupils at the end of the Key Stages will fall within these ranges.

At the end of Key Stages 2 and 3, standards of pupils' performances are set out in 8 level descriptions of increasing difficulty, with an additional description above level 8 to help teachers in differentiating exceptional performance.

The Programmes of Study set out the basis of what should be taught during each Key Stage through Skills and Range.

In science, the programmes of study are related to each of the 3 Key Stages. (It is vital that teachers familiarise themselves with the content of the Key Stage relevant to their situation). The following matrices for the Programme of Study for Key Stage 2 have been designed to show the Skills and Range pupils need to be engaged in. these matrices can be used as broad guidelines for Key Stage 2, although the ability and needs of individual pupils within that Key Stage will have to be taken into account to allow progression.

It is essential that skills permeate all aspects of teaching and learning in the subject.

5. Teaching, Management and Organisation.

“More than anything else, teaching methods affect the response of pupils and determine whether they are interested, motivated and involved in the lesson in such a way as to be engaged in good learning, understanding and development of skills”.

Mid Glamorgan (as it was) Primary Science guidelines uphold that “no one can produce a single formula that is a panacea for all teachers, schools and children”.

It is the responsibility of every teacher to provide a broad, balanced, relevant and differentiated curriculum. Providing is a difficult task that requires careful planning and sensitive teaching by teachers with a broad understanding of science and the ability to match the work to their pupils’ capabilities. The National Curriculum for science provides scope for challenge within a common framework and the level descriptions are useful devices for gauging for the scope of work appropriate to different levels of skills and competence. At Key Stage 2, 2 hours per week or 72 hours per year should be spent on teaching science.

The Science curriculum should seek to promote classroom practices which facilitate learning through active participation; the greater success is likely when the child works as part of a small group. As a stepping stone to well-organised group work, the class lesson can be used to introduce or to give an explanation of a certain point and later to analyse information so that pupils become active participants.

Where possible, science work will be group based around a termly project. The nature of these groups may vary depending on the age of the children and the classroom organisation employed. One termly project is science based. Sometimes science will be done as an individual subject where the need arises.

Strategies for organising group work evolve to suit individual circumstances. However, the following general points are useful:

- a. Groups should be small enough to ensure individual participation, but the total number of groups must allow for adequate teacher attention.
- b. The working environment should be appropriate and apparatus readily available.
- c. When several groups are working simultaneously, it is usually prudent to link separate tasks to a central theme.
- d. Tasks should be linked to time available so as to ensure satisfaction with a job well done.

6. Resources.

It is essential to the effective teaching of science that plentiful resources are available. A central resource area exists for the storage of science equipment and apparatus. The children must be taught to respect and care for these resources.

The resources include a variety of published schemes and materials which are used for reference. There is equipment which supports work in the Programmes of Study.

7. Class Based Tests.

The assessment of children's work in science should wisely be treated as a phased development which is planned to match the school's progress in implementing its own policy. Assessment is the gathering of information to show: -

- a. How the pupils are responding and progressing
- b. The successes and failures of teaching techniques
- c. The appropriateness of the scheme of work.

The techniques used to gather information can include: -

- a. Observation
- b. Discussion
- c. Listening
- d. Questioning
- e. Class based tests.

Evaluation should be the examination of information gathered to consider its significance in adjusting teaching strategy and in planning future activities. There is no true value in assessment unless it is used as a diagnostic tool.

Evaluation should help to ensure continuity, progression, depth and balance as well as helping to avoid unproductive repetition.

Record keeping is the written report of what has been revealed by assessment and evaluation – it is the summary of these processes. It should at least show what has been experienced and achieved. From the child's point of view it is important to highlight what can, rather than what cannot, be done. A pupil should not be marked down if his/her science skills and knowledge understanding is good when the pupil's written work is poor. The pupil may have shown good skills and knowledge or understanding while discussing.

A sample of each child's work in science is included in a personal folder once a year to reflect the work undertaken and the standard achieved during that term. At the end of a Key Stage, a level description must be read as a whole; the child does not have to prove he/she knows all of it, as long as he/she shows his/her work is up to standard – use best fit.

8. The Relationship between Science and Technology.

Questions about the links and interactions between science and technology assume even more significance than before in the context of the National Curriculum, in which technology is designated a foundation subject. A question about science and technology as integral parts of human culture will be considered briefly here:

What are the similarities and differences between science and technology?

The word "technology", like the word "science", can be used to refer to a human activity or to the products of that activity. In both cases the activity is about solving problems and involves systematic application of intellectual and physical skills. The basic differences between technology and science lie in the purposes for which the problem-solving process is applied and therefore, in the nature of the products of the activity. Whereas the goal of science is the acquisition of new knowledge and understanding, the goal of technology is the production of a successful artefact or system which will have practical effects on people and/or control some aspects of their environment.

The Use of Information Technology.

The use of Information Technology is expressed in the skills for each Key Stage. Pupils should be given opportunities, where appropriate, to develop and apply their IT capability in their study of science.

9. Organisation of Science.

Our Scheme of Work is planned to provide complete coverage of the Programmes of Study for all Attainment Targets. The cycles for each section are:

English Juniors	(Years 3 + 4) (Years 5 + 6)	2 years
Welsh Juniors	(Years 3 + 4) (Years 5 + 6)	2 years

For each cycle there is range of activities. We may need to refer to the proceeding / preceding sections of the scheme to match needs of some of the slower or more advanced learners.

The activities shown in the scheme give a broad indication of suitable experiences. We must then decide, in accordance with our agreed policy for planning, the precise details of our lessons and whether or not these can be incorporated in the termly topic. To help each person plan the detail of the learning experiences, the scheme contains lists of published schemes, workcards, reference books, visual aids equipment and IT software available in the school.

Lesson Planning

When planning lessons, the common requirements for the appropriate Key Stage should be kept in mind, e.g. the safety element and vocabulary (see Science Wordbank sheet) of any work to be covered should be written in the planning.

Safety: Pupils should be taught to recognise hazards and risks and to follow instructions to control the risks to themselves.

A K.S. 2 pupils should be taught to recognise the hazards and risks to themselves and other resources correctly, taking action to control risks.

The Science scheme is a working document.

At the end of 2010, feedback from teachers –

1. Which skills were covered?
2. Which parts of the range were covered?

Adjust the scheme for all coverage of the skills.

Lee Balbini
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