



**Primary Curriculum
Support Programme**
foghlaim agus forbairt



**School Development
Planning Support**

Science



NCCA
National Council for Curriculum and Assessment
An Chomhairle Náisiúnta Curaclaim agus Measúnachta



SC/01/04

Science

■ Title: Scoil Íde Science Plan

■ Introductory Statement and Rationale

(a) Introductory Statement

Scoil Ide recognizes the importance of the study of Science as an essential element in a full balanced education. This plan was formulated by the staff of Scoil Ide in the academic year 2011- 2012. A small target group worked on the plan before presenting it to the staff and Board of Management, namely Barbara Costello, Anne Marie Smyth, Therese Hanly, Aine Lee and Laura Roche with the Science co ordinator Audrey Dempsey. We used the D.E.S Primary School Curriculum Science and Teacher Guidelines 1999 and the PCSP website as our principal sources of information and procedure.

(b) Rationale

We hope that our Science Curriculum plan will

- Enhance and benefit both teaching and learning in Science throughout the school
- Provide a coherent approach to the teaching of science across the whole school
- Ensure pupils are given adequate opportunities to develop skills and understanding of concepts as envisaged in the Primary School Curriculum.

■ Vision and Aims

(a) Vision:

Science in our school should enable the child to

- Develop a broad range of skills of enquiry
- Cultivate important attitudes and acquire scientific knowledge and concepts about the biological and physical world
- Acquire an appreciation of the contribution of Science and technology to society
- Work scientifically to investigate and explore the world we live in.

(b) Aims:

We endorse the aims of the Primary School curriculum for science:

- to develop knowledge and understanding of scientific and technological concepts through the exploration of human, natural and physical aspects of the environment
- to develop a scientific approach to problem-solving which emphasises understanding and constructive thinking
- to encourage the child to explore, develop and apply scientific ideas and concepts through designing and making activities
- to foster the child's natural curiosity, so encouraging independent enquiry and creative action
- to help the child to appreciate the contribution of science and technology to the social, economic, cultural and other dimensions of society
- to cultivate an appreciation and respect for the diversity of living and non-living things, their

interdependence and interactions

- to encourage the child to behave responsibly to protect, improve and cherish the environment and to become involved in the identification, discussion, resolution and avoidance of environmental problems and so promote sustainable development
- to enable the child to communicate ideas, present work and report findings using a variety of media.

■ Content of Plan

Curriculum:

The science curriculum is presented in two sections. Stands and strand units for each class level and also scientific skills.

Scoil Íde have drafted our own two year plan that all teachers follow. Please find attached to the Science plan.

1 Science Programme:

1.1 Strands and Strand Units with Skills development.

Junior/ Senior Infants and First/ Second classes

Strands

Strand units

Living things

- Myself
- Plants and animals

Energy and forces

- Light
- Sound
- Heat
- Magnetism and electricity
- Forces

Materials

- Properties and characteristics of materials
- Materials and change

Environmental awareness and care

- Caring for my locality

Skills development :

Working scientifically

- Questioning
- Observing
- Predicting
- Investigating and experimenting
- Estimating and measuring
- Analysing
- *Sorting and classifying*
- Recording and communicating

Designing and making

- Exploring
- Planning
- Making

- Evaluating

Third/ Fourth Classes and Fifth/ Sixth Classes

Strands

Strand units

Living things

- Human life
- Plants and animals

Energy and forces

- Light
- Sound
- Heat
- Magnetism and electricity
- Forces

Materials

- Properties and characteristics of materials
- Materials and change

Environmental awareness and care

- Environmental awareness and care
- Science and the environment
- Caring for the environment

Skills Development:

Working scientifically

- Questioning
- Observing
- Predicting
- Investigating and experimenting
- Estimating and measuring
- Analysing
- *Sorting and classifying*
- *Recognising patterns*
- *Interpreting*
- Recording and communicating

Designing and making

- Exploring
- Planning
- Making
- Evaluating

1.2 Children's Ideas:

We use the children's ideas as a starting point for all scientific activity. Some strategies for eliciting such information may include

- Play scenarios
- Talk and discussion
- Questioning
- Listening
- Problem solving tasks
- Annotated drawings
- Teacher designed tests and tasks
- Concept mapping
- Brainstorming

During their scientific activities children should be provided with opportunities to try out, challenge, change or replace ideas.

1.3 *Practical Investigations:*

Teaching methods and approaches create an environment where practical activities are encouraged. Activities will be planned that are appropriate to the children's levels of ability and experience. Teachers use a combination of closed activities and open investigations. Children are given opportunities to investigate and conduct experiments at all class levels ensuring they are aware of the concept of a fair test.

1.4 *Classroom Management:*

Direct teaching will be used in a wide range of lessons to clarify concepts being investigated and ensuring safety practices are applied. Pupils will be encouraged to work on their own problems where possible. Children will be given opportunities to work in different groupings i.e. whole class group, small groups and individually and also to work collaboratively with others. Children will have access to all materials they need for investigations and will have opportunities to share ideas and communicate their findings.

1.5 *Key Methodologies:*

We as a staff make full use of the different teaching methodologies and approaches as per the curriculum to facilitate the efficient implementation of the Science curriculum including

- Using the environment
- Active learning
- Guided and discovery learning
- Free exploration of materials
- Learning through language

1.6 *Linkage and Integration:*

An integrated approach within SESE and other curricular areas is advocated. We will utilise our Science lessons as opportunities to develop children's language competence and confidence.

1.7 *Using the Environment:*

Scoil Ide have access to a host of local amenities including the local Corkagh Park. This park offers fantastic services including trails and different habitats in the local environment. It also has a pet farm that the children can avail of to see animals in the natural environment.

We also have a local canal that can be used as a resource for science trails and experiments.

1.8 *Balance between Knowledge and Skills:*

Working scientifically will involve children in

- observing
- questioning
- predicting

- investigating and experimenting
- estimating and measuring
- Analysing
- Recording and communicating

These skills are seldom met in isolation but are component parts of an investigative approach to Science. Examples of how each of these skills might be used at the different class level are found in the Science curriculum

Infant levels pages 20-21

1st/ 2nd class levels pages 36-38

3rd/ 4th class levels pages 55-56

5th/ 6th class levels pages 78-80

The concepts and knowledge to be explored by the child are outlined in the content strands of the science curriculum. It is through the study of these areas of content that the scientific and technological skills will be developed.

Teachers will use appropriate approaches and methodologies to enable children to work scientifically and provide them with opportunities to apply the science skills they are developing.

During scientific activities children will be provided with opportunities for structured and unstructured exploration of materials, objects and models.

Children will be provided with opportunities to design and make objects that work, explore the design of ordinary objects.e.g. tea pots and develop craft handling skills.

Children will be encouraged to design and make artefacts and models that will provide solutions to practical problems and will ensure they use the skills involved i.e. exploring, planning, making and evaluating.

2 Assessment – Looking at Childrens’ Work:

The assessment of Science at Scoil Ide will enhance teaching and learning in a number of ways. It will:

- Assist in planning and support future learning for the children
- Indicate positive achievements of each pupil engaged in the scientific topics
- Indicate possible areas of development in the children’s learning
- Indicate areas of learning difficulties encountered by the children
- Help the teacher to identify approaches of learning experiences that could help the children improve their learning
- Provide valuable opportunities to gain evidence of a child’s progress in areas such as Mathematics, Language and Social development
- Provide an indication of the child’s overall achievement in a systematic way at regular intervals
- Display a continuity between classes and schools (primary and post-primary) in relation to such procedures
- The procedures will allow for effective communication of relevant information to parents, teachers, the Department of Education and Science, and other agencies.

Assessment in Science must be valid and seek to measure and report on the child’s progress and achievements throughout all aspects of the curriculum. The assessment techniques in Science must focus on:

- Knowledge objectives
- Understanding of scientific concepts
- Competence in the application of experimental and investigative skills
- The cultivation of important attitudes

The assessment of Science will be a continuous process. The effectiveness of assessment in Science will be dependent on teacher skills of observation, listening, interacting with the children and scrutinising the outcomes of the learning tasks used in Science.

The following are among the assessment tools that we will use in Science:

- Observation
- Tasks and tests

- Concept mapping
- Work samples, portfolios and projects
- Curriculum profiles

There will be opportunities for the children to engage in self assessment as they analyse the success of design and make activities and get an opportunity to view their own work portfolios.

Parents will be informed of their children's progress through:

- Parent/teacher meetings
- The homework journal
- Signing of all formal tests

3 *Children with Different Needs:*

It is important that all children experience a rounded environmental education. Science plays a pivotal role in this education and so we will do our best to ensure that every child will have opportunities to engage in learning activities appropriate to their abilities.

A number of techniques will be used to provide a different range of learning activities appropriate to the individual needs of the pupils.

We envisage that

- Teachers will use a mixture of whole-class teaching and group work, with different groups set tasks of various complexities
- Teachers will develop their questioning techniques spanning from simple recall to more complex and analytical skills so that all students will have opportunities for success
- Different ways of recording and communicating findings will be encouraged
 - Drawing
 - ICT
 - Written records
 - Oral reports
 - Models
- SNA support for particular children or groups as directed by the class teacher
- All children the benefit from active involvement in the environment so all will be encouraged to participate in fieldwork.
- The exceptional ability children will be encouraged to undertake additional research and recording their scientific findings in a variety of ways

All teachers will familiarize themselves with the Draft Guidelines for Children with General Learning Difficulties (NCCA).

4 *Equality of Participation and Access:*

Provision will be made to ensure that the staff will identify and ensure that provision is made, as and where necessary for the following:

- Members of the Traveller Community
- Children experiencing any form of disadvantage
- Children with disabilities
- Families with literacy problems
- Families for whom English is not the first language

Science will be taught for all children regardless of gender, age or disability.

Organisation:

5 *Timetable:*

It is envisaged that there would be a dedicated time for Science in teacher's weekly timetable. Also it is our intention that during Science week each year, every class would hold a number of Science lessons. We are also aware that some pupils are withdrawn from the classroom at certain times during the day. We shall

endeavour to accommodate these children- We would intend that they would not miss Science activities on a regular basis. Our timetables will reflect this.

6 Resources and Equipment:

Access to an adequate supply of suitable teaching materials is essential for the development of an holistic approach to the teaching of Science.

We have taken the following steps to ensure all classes have access to equipment

- Materials/ resources will be stored centrally and used on a sign in/ sign out basis.
- A catalogue of resources and ICT websites are stored with the equipment. Science CD's are available in the computer room.
- We encourage the use of science websites providing this is within the safe use of the internet guidelines.
- Staff members evaluate the materials in use and consult with the principal and post holder on the selection of materials, equipment, games and text books.
- Teachers are given the opportunity to discuss anything with regards to the Science curriculum at staff meetings.
- Teachers are encouraged to share all materials and ideas with their colleagues.

7 Safety:

We have a Health and Safety policy in place in our school which covers safety concerning the handling of equipment and out of school activities such as fieldwork.

Teachers will consult with the Principal whenever it is proposed to engage in fieldwork.

Safe outdoor work will be based in areas that are accessible for children, teachers and helpers.

Preliminary visits by teachers to the site will be necessary to identify potential hazards. If there are apparent dangers then a more suitable habitat will be selected for study. Habitat work involves children working with plants and animals, and teachers will be made aware that some children may be allergic to some plants and animals.

Safety is a regular concern for all members of the school community. At the beginning of every lesson, safety measures to be taken are highlighted. If possible, parents of the children and/or Special Needs Assistants are asked to assist by overseeing the safety of groups of pupils. This is also in use if the children have to work outside the school or on the school grounds.

All safety measures/guidelines are highlighted in the Curriculum:

Safety in general	Teacher Guidelines	p27
Outdoor exploration and investigation	Teacher Guidelines	p58-59
Light	Teacher Guidelines	p86
Electricity	Teacher Guidelines	p97
Magnetism	Teacher Guidelines	p105
Forces	Teacher Guidelines	p107
Heat	Teacher Guidelines	p129

8 Homework:

Depending on the class level, homework ranges in time from 20 – 40 minutes. Science homework may be content related and in written form. We try to ensure that there is a balance between skill and knowledge based homework. Research topics may be added as many of the children use the local library. We recommend that differentiation be accommodated in homework e.g., drawing, annotated drawings, comic strip representation, scientists report etc.

9 Individual Teachers' Planning and Reporting:

Teachers will consult this Whole School Plan and the curriculum documents for Science when they are drawing up their long and short term plans.

Cúnais Míósúil will assist in recording work covered, in evaluating progress in Science and informing future teaching

10 Staff Development:

Teachers will be encouraged to attend in-service workshops and courses on Science in order to enhance their understanding and teaching of the subject. They will upskill other staff in what they have learned by sharing the expertise acquired at these courses. This will be done at staff meetings.

The culture in our school is one that encourages the sharing of experience and good practice.

11 Parental Involvement:

Parents are encouraged when needed, to come to the school, to help out in the delivery of this programme. This may be in the supervision of fieldwork or taking part in whole school science activities

Parents are encouraged to help their children to make scientific discoveries as part of their homework.

12 Community Links:

Parents and members of the community who could make a particular contribution to the Science programme are encouraged to visit the school/classes e.g. a gardener from Corkagh park.

Senior classes will visit or partake in the Young Scientist exhibition where possible.

We will partake in science activities where possible e.g. science workshops, green school activities, tree week and engineering week. Speakers will be invited from the zoo and local park also.

■ Success Criteria

The following criteria will indicate success

- Teacher's preparation will be based on the plan
- The procedures outlined in this plan will be consistently followed
- The children will acquire scientific skills which will enable them to explore and investigate their world.
- Feedback from teachers/ parents/ pupils and inspectors will be taken on board

■ Implementation

(a) Roles and Responsibilities:

Audrey Dempsey the coordinator for Science will coordinate the progress of the plan, encourage and accept feedback on its implementation and report to staff on findings.

(b) Timeframe:

The plan will be implemented in September 2012

■ Review

(a) Roles and Responsibilities:

The following will be involved in reviewing the Science plan

- Science co ordinator
- Principal
- BOM
- Teachers
- Parents

(b) Timeframe:

The Science plan will be reviewed in June 2015

■ Ratification and Communication

This plan was ratified by the Board of management on _____

The plan will be communicated to all relevant parties.

