

Whole School Plan Science

■ Introductory Statement and Rationale

(a) Introductory Statement

This plan was written by the principal and staff of Knock National School following a review of the current science plan and after consultation amongst the staff.

(b) Rationale

In line with the Department of Education and Science guidelines (1999) we focussed on this area of planning to ensure that the revised guidelines for science were introduced in our school in an organised, coherent and accountable manner. It is envisaged that this plan will benefit teaching and learning in our school, in addition to providing a coherent approach to the teaching of Science across the whole school. This plan resulted from a review of our existing science plan undertaken in February 2014.

■ Vision and Aims

(a) Vision:

Through our school's science programme, we aim to help pupils to come to an understanding of and take an interest in the world and environment around them, both physical and biological. We seek to develop a broad range of skills of enquiry and cultivation of important attitudes with the acquisition of scientific knowledge and concepts about the biological and physical aspects of the world. We encourage practical investigation keeping in mind that this is central to science enquiry. As science is a subject that many pupils will encounter at second level, we hope that exposure in primary school will make our pupils more familiar with and interested in science at the next level. We aim to develop a sense of respect and responsibility amongst the pupils towards their local area.

(b) Aims:

The aims of social, environmental and scientific education are:

- to enable the child to acquire knowledge, skills and attitudes so as to develop an informed and critical understanding of social, environmental and scientific issues
- to reinforce and stimulate curiosity and imagination about local and wider environments
- to enable the child to play a responsible role as an individual, as a family member and as a member of local, regional, national, European and global communities
- to foster an understanding of, and concern for, the total interdependence of all humans, all living things and the Earth on which they live
- to foster a sense of responsibility for the long-term care of the environment and a commitment to promote the sustainable use of the Earth's resources through personal life-style and participation in collective environmental decision-making
- to cultivate humane and responsible attitudes and an appreciation of the world in accordance with beliefs and values

Short-term Aims:

- Continue participation in the Green School Programme
- Integrate other specifically designated days and weeks into our school calendar e.g. national tree week, energy awareness week, walk to school week etc.
- Visit, explore and investigate places of interest in our locality e.g. Local hedgerows and other areas for habitat studies, trip to Turlough House etc
- Organise speakers of interest e.g. Education Officer Connemara National Park

■ Content of Plan

1.0 Curriculum

1.1 Strands and Strand Units

We have attached two year planning grid. Teachers in our school are familiar with the strands, strand units and content objectives for their classes. Teachers will ensure within their individual planning that there will be progress from class to class as regards content and skills development of the science programme. Yearly planning templates will be made available to all teachers in order to ensure familiarity with the science curriculum across the school in the event of teachers changing classes. We are aware that the strands of the science curriculum are covered each year and the strand units and a full range of objectives are covered over two years. Equal emphasis will be given to each strand and strand unit. Teachers will ensure that children's learning relates to everyday life through the study of science relating to our local environment and through the Green Schools project. The study of human growth, development and reproduction is taught in line with the school's RSE policy.

1.2 Children's Ideas

We will use children's ideas as a starting point for all scientific activity. We encourage a hands on practical approach to science.

We find out what the children know already through the following:

- talk and discussion
- questioning and listening
- problem solving tasks
- annotated drawings
- teacher designed tasks

From time to time concept mapping is used as an assessment (AfL and AoL) strategy. Pupils will have opportunities to pose and test their own questions during scientific work in the classroom and during outdoor work. Children's ideas are modified by being challenged.

1.3 Practical Investigations

Hands-on, practical investigations are encouraged for all class levels. Practical investigations usually occur during the context of a Science class and through the elements of design and make. We will differentiate investigations to meet the needs of all pupils. We will differentiate the work for older and more able

children where they will be encouraged to undertake further research in the area if they so wish. We will use a combination of open and closed investigations. Children are encouraged to partake in free exploration of science materials. Practical investigations using the fair test principle are encouraged throughout the school.

1.4 Classroom Management

Knock National School is a seven teacher school with five mainstream class teachers. As a result there are certain factors that must be taken into consideration in relation to multi class. Teachers make use of the teacher directed whole class work, small group work and individual work on chosen topics. Children partake in group work, grouped across the classes regardless of age, ability. Within the classes we will differentiate the work for the different ages by expecting the older children to cover more ground in depth and content and presentation. We will take account of children with different needs and the Learning Support/Resource teacher and Special Needs Assistant may support the class if the need arises. In the event of using textbooks, they are selected after consultation within the staff. At present we draw on a variety of resources to supplement the teaching of science in the classroom. Textbooks are used judiciously in all classrooms. All children have equal access to science materials available within the school. Science work will be displayed in classrooms and may be selected for display on notice boards throughout the school and/or the Green School notice board.

1.5 Key Methodologies

We will ensure that the key methodologies of the primary curriculum are used during scientific discovery, these include;

- Using the environment
- Active Learning
- Guided and discovery learning
- Free exploration of materials
- Spiral nature of the curriculum – building on prior learning
- Learning through language.

Pupils will be given opportunities to engage in outdoor seasonal habitat work both within the schools grounds and the local area. As we are located in Knock we have easy access to local green areas, hedgerows, bogs, lakes etc should teachers wish to use them. Our school grounds provide a rich resource for fieldwork, due to the number of habitats i.e. bug hotel, wildlife area, tree, vegetable garden, tunnel, willow tunnel etc. Children are encouraged to test out their own ideas and learn from their peers in addition to freely exploring science equipment and materials. Teachers are aware of the spiral nature of the SESE curriculum and build on knowledge and skills as children progress throughout the school. We encourage the use and development of scientific language and vocabulary e.g. fair testing, investigative work etc. Activities are adapted and modified to ensure that they meet the individual needs of all children, teachers will carry this out in their individual classes.

1.6 Linkage and Integration

The linkage of the four strands in Science is encouraged. There are opportunities to link topics across the

science curriculum using strands and strand units. Teachers often make use of integrated topics, this will be reflected in their planning/project work. The curriculum allows for integration of the SESE subjects. Science naturally integrates with history and geography, examples of topics which link and integrate with science include

- Science can be linked with other curricular areas using a thematic approach e.g. seasons, festivals, Green Schools etc
- Human life units on growth and reproduction will integrate with SPHE and RSE curriculum
- Design and make activities will also form part of the visual arts content
- Links with the maths curriculum are many e.g. graphing results of investigations, measuring, colour, shape etc
- Environmental awareness and care is closely integrated with the geography curriculum

Science lessons are used as a basis to develop scientific language and vocabulary e.g. electricity – circuits, bulbs, battery etc.

1.7 Using the Environment

We have carried out our SESE Environmental Audit and have appended this to our science plan. The possibilities provided by the environmental audit for habitat work will be explored by individual class teachers. There are a range of habitats within the surrounding area these include;

- Walls around school yard and stone walls at the school entrance
- Concrete/tarmac areas on school grounds
- Willow tunnel
- Grass areas on school grounds (e.g. the pitch and other grassy areas)
- Study of mini-beasts on concrete surface area, bug hotel, vegetable patch, wild area and planted area
- Study of trees in the school and Shrine grounds (deciduous trees, evergreen trees)
- Study of trees in wooded area at back of the Shrine grounds
- Fruit growing on hedgerows (berries, fruit etc.)
- Fruit growing and cultivation of apple tree, strawberry plants etc
- Flowerbeds and pots - bulbs, bedding plants, spring/summer flowers
- Birds in our school grounds

We have prioritised the further development of the mini beast habitat and wild life area. Mrs Coyne and the Green School Committee lead the Green School programme. ***Classes will be given responsibility for the maintenance and enhancement of selected indoor and outdoor areas around the school.*** Classes will be encouraged to participate in the many science activities that the school is currently involved in e.g. science week etc. Pupils are given opportunities to observe a variety of living things in their immediate environment. We will look at the possibility of undertaking an SESE trail in our local area incorporating elements of the built and natural environment.

There are people/organisations within our locality that could act as a resource these include:

- Sharon Cameron – Mayo County Council Green School Co-ordinator
- Local Doctor/ Nurse - Healthy Eating - food and nutrition

- Local Vet – link with animals and caring for
- INTO Heritage in Schools programme – Mr. Gordon Darcy
- Personnel from Knock museum

We will use our local environment and our environmental audit to support our science curriculum in so far as is possible. We encourage children to take an interest in the wider global environment, both through environmental awareness and through integration with geography curriculum – people and other places, life, climate etc in foreign countries. We also have international children within the school and integrate their cultures, lifestyle where possible. We are currently working towards our fifth Green flag on Biodiversity, we employ strategies throughout the school to ensure the children show good example in relation to litter, energy awareness, recycling etc. We take part in annual COW and WOW days. We have held very successful action days in the past, parents and members of the local tidy towns committee assist with such events. Teachers consult with the geography fieldwork guidelines prior to undertaking fieldwork in the primary school.

1.8 Balance between Knowledge and Skills

Science is not only concerned with the acquisition of knowledge but also the understanding of concepts. scientific skills which we develop through the content of the science curriculum include:

- Questioning
- Predicting
- Observing
- Investigating and experimenting
- Estimating and measuring
- Analysing
- Recording and Communicating

Teachers will refer to the curriculum appropriate to their class level for content of science skills. The children will be working in a scientific way, questioning, observing, predicting, investigating, analysing and recording during science class. The skills of the science curriculum will be developed through the teaching of the content of the strand units, with children actively participating in science discovery. Children are given opportunities to play with and explore science materials. Pupils will be given opportunities to engage in design and make activities in each class appropriate to their ability and area of study. Design and make usually occurs through the study of the strand units of the curriculum e.g. design and make a lighthouse, design and make a boat, design and make percussion instruments, design and make an electric quiz etc. This will be reflected in teachers planning. Through design and make activities the children will employ the following skills

- Exploring
- Planning
- Making
- Evaluating

2. Assessment – Looking at children’s’ work

Refer to schools policy on Assessment and Record keeping.

Assessment in science considers the following areas:

- Understanding of knowledge
- Scientific skills
- Attitudes towards science and investigation
- Ability to work collaboratively

Assessment will be in the form of:

- Teacher observation
- Annotated drawing
- Concept mapping
- Teacher-designed tests and tasks
- Portfolios and project work
- Work samples and displays of work

Children are given opportunities to assess their own and each other’s work particularly during design and make. They are encouraged to orally present work and accept feedback from their peers. Teacher assessment of progress in science is ongoing during the study of the strand units. This assessment will inform teachers class planning, this in turn will inform our whole school plan. Teachers share curricular information with each other as children progress from class to class throughout the school. Information from assessment will be communicated to parents at the parent/teacher meetings, and through end of year report cards.

3 Children with Different Needs

Teachers are familiar with the NCCA guidelines for teachers of children with General Learning Disabilities and Exceptionally Able Children.

Our aim is to provide for children with Different Needs throughout the school. Children with differing needs will be encouraged to participate in all scientific activities and will have the opportunity to work with other children. We provide for individual difference using some of the following strategies:

- Using a combination of whole class teaching and focused group work
- Planning topics that provide opportunities for further investigative work for more/less able
- Planning topics that are based in a familiar context
- Starting with the children’s ideas
- Provide opportunities for interacting and working with other children in groups
- Allowing children to work with concrete materials
- Using investigations as the basis for practical work. (p.35 T.G)
- Children will have the support of the SNA and the assistance of support teachers should the need

arise.

- Encouraging the more able child to undertake independent project work

4. Equality of Participation and Access:

Refer to Equality Policy.

Science will be for all children regardless of gender, age or ability. Girls and boys are given equal opportunity to participate in all science activities. The role of women in addition to that of men in science is explored. Science can be used as a basis to broaden the pupils understanding of other cultures and environments e.g. peoples homes, clothes, weather, food, materials. Parents' concerns in relation to the teaching of human growth, development and reproduction will be dealt with in line with our RSE policy. Children experiencing any form of difficulty will have the assistance of the support teachers and SNA.

5. Organisational Planning

Timetable

In keeping with the recommendations in the Primary School Curriculum Introduction (page 70) a minimum of three hours will be allocated to SESE per week, from first class to sixth, and two and a quarter hours with the infant classes. In the Infant classes science is taught as an integral part of the SESE curriculum.

On occasion, time will be blocked as appropriate. This might occur when:

- working on a (integrated) project
- exploring a local habitat
- devising and undertaking a local trail

6. Resources and Equipment

Refer to attached inventory of general resources.

We have equipment available for each strand unit of the curriculum, some of these are stored in the hall. Teachers also have their own resources. We supplement the teaching of science with textbooks, resources from the internet, Discover Science materials and other available resources.

We have attached safety in science guidelines, teachers are also familiar with the Be Safe booklet. The school encourages the use of ICT to support science in the classrooms. Teachers adhere to the Acceptable User Policy guidelines when using the internet to support science.

7. Safety

Please refer to the schools Health and Safety statement and Safety in Science activities.

Teachers regularly teach and comment on safe procedures in Science.

8. Homework

Refer to school homework policy.

We encourage the children to undertake investigative work at home. Science homework reflects the active learning approach employed in the classrooms e.g. children investigate and collect at home, use of internet in library/at home. From time to time it may be necessary for the children in various classes to investigate materials and habitats etc. In regard to homework special consideration may be given to pupils experiencing difficulty.

9. Individual Teachers' Planning and Reporting

- Teachers will report on work completed in the Cúntas Míósúil. These will help inform teachers future planning and review of whole school plan
- Teachers will use the Whole School Plan and yearly plans to inform their classroom planning.
- Teachers will use the science curriculum strands and strand units when planning

10. Staff Development

Teachers are made aware of opportunities to attend science courses and training. All staff are made aware of availability of courses in Mayo Education Centre and encouraged to attend. Where teachers have expertise in a particular area they are encouraged to share this with each other. From time to time teachers may team teach. If teachers need to be supported in a particular area colleagues/principal will support the teacher as regards resources, materials and planning. Teachers have access to reference books, resource materials, and websites dealing with science. School personnel can research new methodologies and approaches and are encouraged to use these in the classroom and share with colleagues.

11. Parental Involvement

Parents are aware of and encouraged to support the school's science programme. Parents encourage their children to be actively involved in science activities particularly in relation to the environment. Parents are an integral part of our school community and regularly attend the school to attend/participate in events e.g. action day, assemblies etc.

12. Community Links

We have identified local people and organisations that can support our science curriculum within our resources audit. We hope these people will visit the school and support the delivery of the science curriculum. We have strong links with our local Tidy Towns' Committee

13. Success Criteria

We intend to review the plan and measure our success under the following headings.

How will we know that the plan has been implemented?

- Teacher's preparation based on this plan
- Teachers are using whole school plan, strands, strand units and content objectives of the Science curriculum when planning
- Procedures outlined in this plan are consistently followed

Has this plan achieved its aim?

- Teacher/parent feedback
- Children's feedback
- Inspector's feedback
- Review of short term aims

Has the plan promoted the key considerations when implementing the Science Programme?

- Evidence of practical activity in classrooms
- Children's ideas are used as a starting point for scientific activity
- Evidence of environmental awareness among pupils
- Evidence of classes engaging in outdoor habitat work
- Evidence of design and make activities throughout the school
- Observing children's skill acquisition and scientific language development throughout the school

■ Implementation

(a) Roles and Responsibilities:

Class teachers are responsible for the implementation of the science programme for their own classes. The plan will be monitored throughout and reviewed after the two year cycle, if necessary.

(b) Timeframe:

Science has been implemented in our school using a two year cycle.

■ Review

This plan will be reviewed after the two year science cycle. It is hoped to discuss all areas at that stage and review and change the plan accordingly. Teachers will be involved with review.

■ Ratification and Communication

This plan was presented to the school Board of Management and ratified on 26th February 2014.

A copy of this plan will be published on the school website.