

# Scoil Ursula

## ■ Title

### SCIENCE PLAN

## ■ Introductory Statement

This plan was originally formulated by the Principal and staff following introductory science inservice days, in-school planning days, environmental audit and PCSP Cuiditheoir visit in 2007. It was reviewed in Autumn 2010 and ratified by the BOM on the 22<sup>nd</sup> of November, 2010. It was reviewed and further updated during the school year 2016/17.

## ■ Rationale

This policy was devised to benefit teaching and learning in our school. It was framed with a view to providing a coherent approach to the teaching of science across the whole school and developed in order to ensure that our pupils are given adequate opportunities to develop skills and understanding of scientific concepts as envisaged in the Primary School Curriculum. In keeping with the guidelines laid down by the DES, we focussed on this area of planning to ensure that the revised curriculum for science was introduced in our school in a well-planned and organised manner. We wanted to ensure continuity of approach throughout the school. This plan will benefit the teachers by informing classroom planning and will be of ultimate benefit to pupils by ensuring science activities are balanced and well-planned.

## ■ Relationship to Characteristic Spirit of the School

As part of our overall child-centred curriculum in Scoil Ursula, our Science curriculum encompasses knowledge and understanding of the biological and physical aspects of the world and the processes through which such knowledge and understanding are developed. Through our science education, children will construct, modify and develop a broad range of scientific concepts and ideas. Working scientifically involves them in observation, questioning, discussion, prediction, analysis, exploration, investigation, and experimentation, while the knowledge and skills they acquire may be applied in designing and making tasks. We encourage a respect for the evidence of scientific enquiry, while the collaborative nature of the activities we will undertake will also help our pupils to acquire social and co-operative skills. Investigations and problem-solving tasks will nurture the inventive and creative capacities of our students. This will also promote sensitivity to, and a personal sense of responsibility for, local and wider environments and thus will foster the concept of people as custodians of the Earth for future generations.

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 believe that science should be a practical subject with hands-on, interactive activities that pupils will experience in a fun way. We aim to provide opportunities to develop scientific investigation skills. The skills learned through science activity are also skills for life. 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. Environmental activities encouraged in our school will foster a positive attitude and sense of responsibility among our pupils for the natural environment and its relationship with the human environment. There is a strong emphasis in our school, through the Green Schools' Programme, on developing a sense that everyone has a role to play as custodians of our natural heritage. We aim to use and develop the potential of our own school grounds for scientific study.

## ■ Aims

- 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.

### **In addition we aim to:**

- Expand the use of our Outdoor Classroom (School Garden) to classes throughout the school.
- Continue participation in the Green School Programme and applying for our 7<sup>th</sup> Green Flag for Energy Conservation.
- Take part in activities during Science Week, National Tree Week, Energy Awareness Week and other such initiatives.
- Audit and organise existing and purchase additional science equipment as required.
- Avail of PDST Support through their website and CPD opportunities.
- Continue the development of our woodland walk and develop suitable habitat activities within the school grounds.
- Continue participation in Science Week activities in Sligo IT
- Use of home-made and commercial bird feeders to facilitate bird studies in our school grounds.
- Continue to engage with the Heritage Nature Walks Scheme.
- Make our highly successful inaugural Climate Action Week an annual event.

## ■ Content of the Plan

### Curriculum Content:

The content of the science curriculum has been divided into **four** levels: infant classes, first and second classes, third and fourth classes, and fifth and sixth classes. At each level the content has been divided into **two** distinct sections:

- **content strands**, which outline the subject matter that may be included in the science programme:

*Living things*

*Energy and forces*

*Materials*

*Environmental awareness and care*

- a **skills section**, which covers:

*Working scientifically*

*Designing and making.*

## 1. Science programme

### 1.1 Strands and strand units

Strand	Infant classes	First and second classes
	Strand units	Strand units
Living things	•Myself •Plants and animals	•Myself •Plants and animals
Energy and forces	•Light •Sound •Heat •Magnetism and electricity •Forces	•Light •Sound •Heat •Magnetism and electricity •Forces
Materials	•Properties and characteristics of materials •Materials and change	•Properties and characteristics of materials •Materials and change
Environmental awareness and care	•Caring for myself and my locality	•Caring for myself and my locality

Strand	Third and fourth classes	Fifth and sixth classes
	Strand units	Strand units
Living things	<ul style="list-style-type: none"> <li>•Human life</li> <li>•Plants and animals</li> </ul>	<ul style="list-style-type: none"> <li>•Human life</li> <li>•Plants and animals</li> </ul>
Energy and forces	<ul style="list-style-type: none"> <li>•Light</li> <li>•Sound</li> <li>•Heat</li> <li>•Magnetism and electricity</li> <li>•Forces</li> </ul>	<ul style="list-style-type: none"> <li>•Light</li> <li>•Sound</li> <li>•Heat</li> <li>•Magnetism and electricity</li> <li>•Forces</li> </ul>
Materials	<ul style="list-style-type: none"> <li>•Properties and characteristics of materials</li> <li>•Materials and change</li> </ul>	<ul style="list-style-type: none"> <li>•Properties and characteristics of materials</li> <li>•Materials and change</li> </ul>
Environmental awareness and care	<ul style="list-style-type: none"> <li>•Environmental awareness</li> <li>•Science and the environment</li> <li>•Caring for the environment</li> </ul>	<ul style="list-style-type: none"> <li>•Environmental awareness</li> <li>•Science and the environment</li> <li>•Caring for the environment</li> </ul>

- Teachers are familiar with the strands/strand units/content objectives for their class level(s).
- Content objectives/strand units are selected and assigned to each class level in a way that will ensure appropriate development from class to class.
- Work from each strand is included for each year.
- Equal emphasis is given to each strand.
- A broad range of topics from each of the strands in the curriculum is included.
- The whole school may adopt a thematic approach at certain stages of the year e.g. Winter.
- Teachers ensure that children’s learning relates to their everyday experiences.
- We have prepared a yearly plan for each class level, which is followed on an annual basis.
- We have included work from each strand for each year.
- A broad range of objectives will be covered during the year. We endeavour to ensure continuity and progression from year to year and avoid duplication.
- We will use a balanced mix of theme-based approach to SESE, cross-curricular work and subject-centre focus.

## **Methodologies:**

### **1.2 Children’s ideas**

- Where possible we use the children’s ideas as a starting point for all scientific activity. This is in keeping with an Inquiry-Based Learning Model as recommended by the STEM Report, 2016.
- Some of the strategies used to find out these ideas are play scenarios; talk and discussion; questioning; listening; problem-solving tasks; annotated drawings; teacher designed tests and tasks; concept mapping etc.

### **1.3 Practical investigations**

- Practical investigations are encouraged in all classes.
- Investigations allow for differentiation to meet the needs of all the children in the school.
- We try to ensure that the children can apply scientific concepts to everyday situations.
- We use a combination of closed activities as well as open investigations.
- Teachers arrange opportunities for children to engage in free exploration of materials.

### **1.4 Classroom management**

- Use is made of the teacher-as-facilitator approach.
- Pupils are enabled to work on their own problems as far as possible.
- We ensure that children have an opportunity to work in different groupings, e.g. whole group, small groups, pairs and individually.
- We also ensure that children have an opportunity to work collaboratively/co-operatively.
- All children are given an opportunity to share ideas and communicate their findings.
- Opportunities are given to display models/projects etc.

### **1.5 Key methodologies**

- As a staff, we ensure that the key methodologies of the primary curriculum are used.
  - Using the environment
  - Active learning
  - Constructivist learning
  - Inquiry-Based learning
  - Problem-Based learning
  - Guided and discovery learning
  - Free exploration of materials
  - Spiral nature of the curriculum – opportunities to return to earlier learning and to extend and enhance it
  - Learning through language
- Differentiation –we adapt and modify activities so that they meet the needs of all children in the class.

### **1.6 Linkage and integration**

- At each class level, where opportunities exist to link activities/concepts to other areas of the science curriculum, these are used.
- Teachers at each class level may identify a set of cross-curricular themes that will enable them to integrate aspects of science with other subject areas. This may also be linked with events such as Science week and the Discovery Science Programme. This is particularly relevant to our efforts as a school to promote STEM Education.
- Conscious efforts are made to utilise science lessons as opportunities to develop children's language competence and confidence.

### **1.7 Using the environment**

- Features of our local environment are incorporated into the science programme. Our School Garden or Outdoor Classroom and our 'Slí na Coille' are environmental resources that we have developed to support and enhance our Science Curriculum.
- Pupils are given opportunities to observe a variety of living things in their immediate environment.
- We use internet and audio-visual resources to enable the children to observe the broader global environment

- We utilise people/groups within the locality that have expertise in any scientific area by inviting them to give talks and/or accompany us on field trips.
- The school participates in schemes to foster environmental awareness and care e.g. Green Schools project, Discover Science and Maths Awards etc. and we involve parents and members of the wider community.
- We also involve children in modelling good environmental practices, *e.g. collecting samples for nature displays, packaging/waste paper...*
- We make appropriate use of recyclable materials for science activities and other subject areas.

### **1.8 Skills Development**

- The following skills are actively developed at all class levels:
  - Questioning
  - Observing
  - Predicting
  - Investigating and experimenting
  - Estimating and measuring
  - Analysing
  - Recording and communicating
- Teachers use a variety of strategies to ensure that pupils have opportunities to use and apply the science skills they are developing.
- Opportunities are afforded at all levels for both structured and unstructured play/exploration.
- Opportunities are also afforded for pupils to design and make models of their own choice.
- We try to ensure that children work through all the skills involved in designing and making
  - Exploring
  - Planning
  - Making
  - Evaluating

### **2. Assessment - Looking at children's work**

- We give the children opportunities to record their work in a variety of different ways, *e.g. concrete materials, oral presentation, drawings, photographs, written records, etc.*
- We assess knowledge and skills development as well as attitude.
- Children also have opportunities to assess their own work and that of their peers.
- Teachers use ongoing observation as well as testing the results of which are used to inform class teaching and whole school approaches.
- Assessment information is reported to parents on end-of-year reports as well as at PT Meetings.

### **3. Children with different needs**

- We endeavour to adapt and modify activities to cater for the full range of learning abilities in our science teaching, for example, children with general and specific learning disabilities, children receiving learning-support, children whose first language is neither Irish nor English, children who are exceptionally able.
- The school provides challenges for children of exceptional ability such as
  - Differentiated programme within the classroom and/or homework
  - Use of ICT
  - Independent research projects
  - Working with parents/older pupils

### **4. Equality of participation and access**

- Equal opportunities are given to boys and girls to participate in all activities to minimise

perceived gender difference in relation to science.

- Opportunities are given within the science programme to broaden the pupils' understanding of other cultures and environments.
- Concerns about certain aspects of the science programme in relation to human growth, development and reproduction are treated sensitively and parents are given an option to withdraw their children should they wish to do so.
- All children have access to services, facilities, or amenities in the school environment.
- Equality of access to the Science Curriculum is provided without prejudice to enrollees of any of the following groups:
  - 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

## **5. Timetable**

- Science is timetabled as an integral part of the SESE time allocation. In the Senior Classrooms, one hour of SESE time per week is allotted plus 20 minutes discretionary time. In the Junior Classrooms, one hour per week is allowed.
- When drafting timetables for withdrawal of pupils for supplementary teaching, teachers endeavour to ensure that pupils do not miss out on the Science curricular time.

## **6. Resources and equipment**

- The SESE programme currently in use in the school is the Small World series by CJ Fallon.
- A wide variety of teaching resources are available in the school to support the delivery of our Science Curriculum. These include books, CDs, DVDs, videos as well as a range of equipment across the four strands for each class level. These are stored in the resource room and replenished as necessary.
- We integrate ICT, where appropriate to enhance the learning of scientific concepts through the use of Beebots, Lego We Do, Internet and DVDs. We have a code of practice to ensure safe Internet usage.

## **7. Health & Safety**

- The school's safety statement deals with the safe storage and handling of materials associated with science activities.
- Class Teachers regularly teach about the need for safe procedures and routines and indeed safety issues in general form a major part of our Science Programme e.g. Electricity Safety.

## **8. Homework**

- Science homework is given regularly to reinforce and extend work covered during class lessons.
- The homework given reflects the active learning approach as described in the curriculum through home experiments where appropriate and where materials are not available in the school.
- Science homework is differentiated according to need.

## **9. Individual teachers' planning and reporting**

- Each teacher is responsible for his/her planning for Science.
- Progress is reported as part of the Cúntais Míósúil each month.

## **10. Staff development**

- Teachers have access to reference books, resource materials, equipment and websites dealing with Science.
- School personnel are encouraged to research new methodologies and can arrange for demonstrations, opportunities to try out materials and assess whether or not they should be purchased.
- Information about in-service courses, school visits, Science events is communicated to all teachers through the staff notice-board.
- Teachers are encouraged to attend in-service courses after which there is a sharing of the expertise acquired at these courses.
- Time is allocated at staff meetings to discuss aspects of the Science Curriculum.

## **11. Parental involvement**

- Parents are made aware of the nature and purpose of the science curriculum through their representatives on the Board of Management.
- They are encouraged to assist their child's learning through participating in home experiments, helping with other homework and bringing their child to events such as Science week events in Sligo IT.

## **12. Community links**

- Where there are scientists, engineers and designers among our parental community and in the locality who work with the children from time to time. One particular parent from the Science Faculty of Sligo IT is a regular contributor to our Scientific endeavours in the school.
- We collaborate with our sister Ursuline school, St. Angela's College and their Lifelong Learning Programme which provides robotics workshops to our senior pupils. The college also makes available a suite of resources for use in the school.
- Through the Junior Achievement Programme in conjunction Abbott Ireland, tutors are trained to give lessons to our classes many of which have a scientific input.
- Occasionally children are given opportunities to display their work e.g. Science displays during Science Week.

### **■ Success Criteria**

Our success criteria will be based on the achievement of our objectives. We will use staff observation and parental feedback as our benchmark for success or otherwise of the policy.

### **■ Roles and Responsibilities**

The school principal will be responsible for the implementation and evaluation of the policy. Any feedback received will be recorded and any problems that arise will be taken into account for the purposes of evaluation and review.



### ■ **Timeframe for Implementation**

The policy is implemented on a continuous basis year to year.

### ■ **Timeframe for Review**

This policy is due for review in 2019/20.

### ■ **Responsibility for Review**

The school principal, curricular lead and staff will be responsible for reviewing the policy.

### ■ **Ratification and Communication**

The Board of Management ratified this policy on the \_\_\_\_\_ of \_\_\_\_\_.

Signed: \_\_\_\_\_, (Chairperson, BOM)

**Scoil Ursula does not have adequate resources to disseminate all of its policies to all the concerned members of the wider school community. The policy is communicated to the members of the BOM and is available to the wider school community through the parents' representatives on the BOM. All Scoil Ursula policies are available for inspection in the school.**