



St. Patrick's NS Strangsmills

Science Plan

Revised: 2024

www.strangsmillsns.ie

16875G

Introductory Statement and Rationale

(a) Introductory Statement

This policy was originally formulated following the in-service for Science during the school year 2003-2004. The policy outlines the teaching and organisation of Science at St. Patrick's NS Strangsmills. It has been drawn up as a result of staff discussion and meetings over a number of years. The policy was revised in 2006, 2012 and 2019 and updated by the teaching staff in line with current practices and adaptations made as appropriate. This policy was further reviewed and updated again in January 2024. The implementation of this policy is the responsibility of all the teaching staff.

(b) Rationale

This policy was devised for a number of key purposes:

- To benefit teaching and learning in our school
- To provide a coherent approach to the teaching of science across the whole school
- In order to ensure that pupils are given adequate opportunities to develop skills and understanding of concepts as envisaged in the Primary School Curriculum

Vision and Aims

(a) Vision

We seek to foster the children's natural curiosity by enabling them to take an active part in their own learning, by cultivating important attitudes through acquisition of scientific knowledge and concepts about the biological and physical aspects of the world.

Science in our school should enable children to develop an interest in and a curiosity about the world around them (living and non-living). It should give them an appreciation of their environment and their effect on it thus developing individuals who will treat their world and its resources in a responsible way. Science in our school should also develop individuals who observe, ask questions, plan, experiment, analyse and evaluate results. In this way they will have a scientific approach to problem solving.

(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 children to explore, develop and apply scientific ideas and concepts through designing and making activities.
- To foster the child's natural curiosity, so encourage independent enquiry and creative action.
- To help the child appreciate the contribution of science and technology to the social, economic, cultural and dimensions of society.
- 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 support sustainable development.
- To enable the child to communicate ideas, present work and report findings using a variety of media.

In addition some classes may choose to participate in the following:

- Take part in certain activities during National Tree Week, Engineers week, Science Week etc
- Work towards achieving additional green flags for our school.
- Engage in Science initiatives and awards
- Maintain the sensory garden

CURRICULUM PLANNING**1. Science programme - Strands and strand units**

All staff are familiar with the strands, strand units and content objectives for their own and other class levels. We feel this is important in order to ensure a coherent programme for SESE and Science throughout the school. As children move from one classroom to the next we liaise with each other so that there is continuity and progression.

A broad range of topics from each of the strands in the curriculum will be included each year. In as far as is possible teachers will ensure that children's learning relates to everyday

experiences by using materials from the children’s environment and by drawing on the children’s ideas and practical experience.

The teaching of human growth, development and reproduction is in line with the school’s plan for the RSE elements of SPHE. Growth and development will be dealt with throughout the school and reproduction will be dealt with in fifth and sixth classes.

Science Programmes:

<u>Strands</u>	<u>Strand Units</u> Infants to 2nd Class	<u>Strand Units</u> 3rd – 6th Classes
Living Things	<ul style="list-style-type: none"> • Myself • Plants and Animals 	<ul style="list-style-type: none"> • Human Life • Plants and animals
Energy and Forces	<ul style="list-style-type: none"> • Light • Sound • Heat • Magnetism and Electricity • Forces 	<ul style="list-style-type: none"> • Light • Sound • Heat • Magnetism and electricity • Forces
Materials	<ul style="list-style-type: none"> • Properties & characteristics of materials • Materials and change 	<ul style="list-style-type: none"> • Properties & characteristics of materials • Materials and change
Environmental Awareness and care	<ul style="list-style-type: none"> • Caring for my locality 	<ul style="list-style-type: none"> • Environmental awareness • Science and the environment • Caring for the environment

Class specific topics: We have outlined specific teaching content in Plant and animal life to ensure a variety of Irish flora and fauna are covered. See below.

Strand	Strand Unit	Junior Infants	Senior Infants	1st class	2nd class
<i>Living Things</i>	<i>Plant & animal life</i>	Robin, Nettle Hawthorn, Frog, swallow, snail	Lords and ladies, vetch, elder, badger, heron, butterfly	Poppy, speedwell, hazel, bat, kestrel, earthworm	Herb Robert, cow parsley, birch, deer, crows, wasp

Two Year plan for 3rd - 6th classes

Strand	Strand Unit	3rd classes	4th class	5th class	6th class
Living Things	Human Life	Specific focus on: ear, mouth, teeth, digestive system, skin, skeletal system	Specific focus on: Lungs, respiratory system, reproduction system	Specific focus on: ear, mouth, teeth, digestive system, skin, skeletal system	Specific focus on: Lungs, respiratory system, reproduction system
	Plant & animal life	Robin, Nettle Hawthorn, Frog, swallow, snail	Lords and ladies, vetch, elder, badger, heron, butterfly	Poppy, speedwell, hazel, bat, kestrel, earthworm	Herb Robert, cow parsley, birch, deer, crows, wasp
Materials	Properties & Characteristics of materials	√		√	
	Materials and Change		√		√
Energy & Forces	Light	√		√	
	Sound	√		√	
	Heat	√		√	
	Magnetism & Electricity		√		√
	Forces		√		√
Environmental Awareness & care	Caring for the environment	√	√	√	√
	Environmental Awareness		√		√
	Science & the Environment	√		√	

- This is a two-yearly plan for science in our school in the senior section. Elements of each strand are dealt with each year.
- It does not at this stage specify which term each strand unit will be worked on. This is left to the discretion of the individual class teacher.
- Some activities will be governed by seasonal factors. Most work on living things will take place in the autumn and spring-summer terms.
- Because of linkage within the science curriculum elements of some strand units will be worked on each year.

(a) Children's Ideas

Children begin from their ideas about how things are, and they change and develop these ideas by testing them in practical investigations. During their scientific activities children will be provided with opportunities to try out, challenge, change or replace ideas. Children therefore will develop and construct more scientific understanding through their own ideas and experiences. Children will be encouraged to give their opinions and any information they may have relating to a subject through play scenarios; talk and discussion; questioning; listening; problem-solving tasks; annotated drawings; teacher designed tests and tasks; concept mapping etc.

(b) Practical investigations

Practical investigations will be encouraged in all classes. Investigations will allow for differentiation to meet the needs of all the children in the school and tasks will be graded in an age/ ability appropriate way.

In as far as possible children will apply their discoveries to everyday situations either in school or at home. Both closed activities and open investigations will be used in all classes in an age appropriate way depending on what is being taught.

In carrying out ***fair tests*** children will identify:

- the variable that they will change
- the variable that will be measured or judged
- the variables that will be controlled or held constant.

They will be encouraged to ask:

1. What is being tested?
2. What will be changed?
3. What will be kept the same?
4. What will be measured or compared?

(c) Classroom Management

The type of work involved in science means that on a practical level there is a lot of preparation on the part of the class teacher. Key considerations for management include:

- How best to group children and provide for individual differences
- Prior collection of materials / availability of resources
- Allowing time for discussion and recording of results
- Visiting planned habitats before study
- Preparation of task sheets
- Safety considerations
- Broad and balanced programme of work
- Seasonal factors
- Adequate adult supervision
- Assessment

(d) Key Methodologies

The method of teaching any one topic is for the individual class teacher to decide. The key methodologies used in science are:

- Talk and discussion
- Active learning
- Guided and discovery learning
- Collaborative learning
- Skills through content
- Using the environment
- Free exploration of materials
- Investigative approach
- Teacher directed approach

Methodologies will be varied, adapted and modified to suit the ability of the children and the task at hand.

(e) Linkage and Integration

There are many opportunities for integration at all levels in the science curriculum. Within the content sections for each class grouping, in the curriculum document, notes below strand units suggest some of the instances where integration might be established. These suggestions along with others of the teachers choosing can be used to develop an integrated unit of work and thus prevent unnecessary repetition.

Significant integration opportunities take place between Science and Geography in the strand unit: Environmental awareness and care. Some additional areas where integration most often occurs are:

- Materials designing and making /Art and Mathematics
- Myself/SPHE and Religion stories and morals
- Living things/History

It should also be remembered that the strands/strand units of the science curriculum are not discrete and that work on a science topic may incorporate objectives from a number of units. The curriculum document provides useful notes on linkage in the content sections for each class grouping. These will be used by the teachers to help plan their work.

Every effort will be made throughout the school to develop the children's language competence and confidence teaching new vocabulary where necessary.

(f) Using the environment

One of the most important aspects of the science curriculum is the emphasis placed on the exploration of the local environment of the child and the school. Features of the immediate school grounds, such as trees, walls etc. will be incorporated into the programme.

All efforts will be made to enhance the immediate school grounds to provide learning opportunities for the children. When taking children outside the immediate school grounds the class teacher will organise for additional adult supervision and take all precautions to ensure the safety of the children at all times.

The school will promote environmental practices such as recycling in order to encourage good practices inside and outside school. Recycled products will be used where possible for science and art activities.

(g) Balance between knowledge and skills

The teaching of science involves two types of understanding: *conceptual understanding and procedural understanding*. Conceptual understanding involves knowledge and by providing a broad and balanced curriculum the children will gain the necessary knowledge. By working scientifically the children will acquire the procedural knowledge necessary.

The skills acquired are

- Questioning
- Observing
- Predicting
- Investigating and experimenting
- Estimating and measuring
- Analysing
- Recording and communicating.

*(Infants Curriculum Statement pp 20-2, 1st/2nd Curriculum Statement pp36-38
3rd/4th Curriculum Statement pp56-58, Refer 5th/6th Curriculum Statement pp 78-80)*

We will also explore opportunities for developing the skills of designing and making.

- Exploring
- Planning
- Making
- Evaluating.

(h) Broad and Balanced Curriculum.

To ensure that our science curriculum is broad and balanced we have developed a two-year plan to be followed by all teachers in the school.

We have included work from each strand each year. We have also included work from each strand unit over a two-year period.

2. Assessment – Looking at children’s work

Children will be encouraged to record their work in various ways:

- Copies –written work/diagrams/experiments recorded
- Charts
- Models
- Photographs etc

We will assess science through:

- Teacher observation (including pupils knowledge, attitudes and ability and ability to work collaboratively, acquisition of skills as well as knowledge)
- Concept mapping
- Annotated drawing
- Teacher-designed tasks and tests
- Quizzes and Kahoot etc
- Questioning
- Portfolios of work
- Parental and pupil feedback
- Projects

There will be opportunities for the pupils 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.

Information from assessment will be communicated to parents in the school report at the end of year and at the parent/teacher meetings.

3. Children with different needs:

In the same way as we endeavour to meet individual needs in all aspects of the curriculum, we will do our best to make science accessible to all children as we recognise the potential science has to help children make sense of the physical and biological worlds in which they live. We are aware of the possibilities for fun and developing a sense of curiosity and wonder that science holds for children.

- 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 pupils will have opportunities for success.
- Different ways of recording and communicating findings will be encouraged: drawing, ICT, written records, oral reports and models.
- All children benefit from active involvement in the environment so all will be encouraged to participate in fieldwork.
- The exceptional ability child will be encouraged to undertake additional research and recording their scientific finding in a variety of ways or to part take in peer tutoring
- SNA support for particular children or groups as directed by class teacher.
- Children with exceptional ability will be encouraged to do independent research projects and to take their work to a higher level where appropriate.

4. Equality of Participation and Access:

Science will be for all children regardless of gender, ability or age. We are committed to providing a teaching environment conducive to learning. Each child is valued, respected and challenged regardless of ability, race, gender, religion, social background, culture or disability. Opportunities within the science programme will be used to broaden the pupils' understanding of their own and other cultures and environments.

ORGANISATIONAL PLANNING

5. Timetabling

Science is part of three hours of SESE, which means one hour per week for science in the senior classes. Two and a quarter hours is to be allocated to SESE in the junior classes, this means fifty minutes of science per week. On occasion teachers may block periods of time. Teachers may use discretionary time as and when needed.

6. Safety

All reasonable effort will be made to keep potentially hazardous equipment out of reach of the children. Teachers will, on a regular basis, make the children aware of the need for safe procedures and routines.

The following recommendations are not exhaustive and are subject to revisions of medical procedures and to recommendations of manufacturers for use of equipment.

Equipment:

- Children should be taught the correct use of all equipment available to them and to return tools correctly after use.
- Scissors: Infant classes should be taught safe use and handling
- Cutting tools: Other types of cutting tools e.g. knives should only be used by adults or under direct adult supervision.
- Glue: Low odour glues or wallpaper paste without fungicides are the most suitable for classroom use. Occasionally there may be a need to use stronger glues and these again should only be used by an adult or under direct adult supervision.
- Teacher should demonstrate the safe use of tools before allowing children to handle them.

Containers:

- Containers, if used outdoors, should be made of plastic, such as clean yoghurt pots or margarine containers.
- Glass containers may from time to time be used indoors. Children should be taught to handle them carefully.
- If a glass container should break then an adult should gather up the broken pieces and dispose of carefully.
- Children should be taught to report a breakage or spillage immediately and not to attempt cleaning up themselves.

Heat:

- A simple source of heat is small candles or night-lights, which will be placed in sand in a metal baking tray.
- Children should be taught never to touch a naked flame or to move about with a lighted candle.
- Boiling water should not be needed. If it is used occasionally then only an adult is allowed to handle it.

- Hot water from a tap poured into a heatproof glass, metal or ceramic container is suitable for most investigations in primary school.
- The safe use of equipment, pouring hot liquids and the medical procedure for burns and scalds should be clarified with children before beginning work.

Electricity:

- Children should not generally handle, plug in or plug out mains-powered equipment.
- Children should be made aware of the dangers associated with mains electricity.
- Mains electricity is never used in investigations.
- Low voltage batteries up to six volts are to be used in electrical circuits.
- Batteries should be stored so that terminals cannot touch and old batteries discarded safely preferably in the recycling depot.
- Batteries will not be cut open.
- Rechargeable batteries should not be used for investigations.
- Only an adult should strip lengths of insulated wire for making circuits.

Light:

When working on the strand unit light the children should be made aware of and adhere to the following safety procedures:

- Children should never look directly at the sun or very bright beams of light
- Plastic mirrors should be used for investigations, and children should avoid the use of glass mirrors.
- Pupils should never look at the sun through lenses.
- Children should be made aware of the dangers of sunburn.
- When using the microscopes children are not to use the UV light.

7. Homework (Refer to Homework Policy)

- Occasionally science homework is given to reinforce the topic being taught in class. In senior classes research for projects, STEM activities, active learning tasks, gathering of materials or recording experiments may be assigned.
- Safety will always be considered when selecting homework assignments.
- If science homework is given, tasks may be adapted for individual pupils if necessary.

8. Individual teachers' planning and reporting

- Teachers will report on work completed in the Cúntas Miosúil. These are kept in individual teacher's planning folders and in the filing cabinet in the office.
- 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.
- Teachers also keep long-term and fortnightly plans using the agreed school headings.

9. Staff development

- If teachers need to be supported in developing the required knowledge and skills to facilitate pupil learning in some aspects of the science curriculum, they will plan collaboratively, pool resources and support one another. If teachers require additional support from outside sources, experts in the science field, parents or speakers from Oide, Science Foundation Ireland or SETU may be sourced.
- Teachers are made aware of any courses held locally in relation to the teaching of Science and encouraged to attend.
- All teachers take responsibility for monitoring developments and co-ordinating staff resources in Science.
- If necessary, time will be allocated at staff meetings to discuss issues related to science.

10. Parental involvement

Parents will be encouraged to take an active part in their child's learning. Parents are welcome to call the school to discuss the science programme with the teacher and may be called on to assist teachers with projects, field trips etc.

- Parents with expertise in the Science field may be invited to the school to support the teaching and learning of Science.
- Home school links may take place on occasion if children in the senior classes are completing projects as part of homework assignments.
- Parents are kept informed of Science related events and achievements through the School newsletter and the school website.
- On occasion parents may be invited to attend Science exhibitions in the school.

11. Community links

If the opportunity arises local crafts people, people with scientific backgrounds etc. maybe asked to call to the school to share their expertise and knowledge with the children.

The school currently has been awarded five green flags – Recycling, Energy conservation, water conservation, global citizenship: marine environment and Travel. A committee comprising of teachers, staff members and pupils is organised and the pupil representatives from each class report back to each individual class on the actions to be implemented. A new committee is formed for each new theme with different class representatives chosen from year to year.

Success Criteria

We will use the following criteria to assess the success of this plan

- Our yearly and classroom planning is based on the Whole School Plan
- There is a balance between skills and content
- Development of scientific skills throughout the classes
- Integrated themes are being developed, on occasion, across the school, using a whole school approach.
- That the curriculum is spiral and developmental in its structure
- Classes are engaged in outdoor observation and trails of the local environment
- Procedures outlined are consistently followed throughout the school
- Feedback from: children, parents, staff and DES inspectorate

Implementation

Roles and Responsibilities

All the teachers are responsible for the implementation of the Science curriculum in their own classrooms and to ensure adherence to the school plan. Teachers will be encouraged to present feedback during planning meetings or a review of teaching and learning of Science.

Timeframe for review

This policy was reviewed during Croke Park hours by staff on January 22nd 2024. This policy will be reviewed again during the 2027/2028 school year.

As we now have an outline plan for the specific strand/strand units for each class level, this will be reviewed on an on-going basis to ensure implementation is successful.

All staff will be involved in the review of this policy. The Board of Management will be consulted and involved in its continued development and review.

Ratification and Communication

This policy was ratified by the Board of Management on January 30th 2024.

Signed: _____
Chairperson BOM

Date: _____