

St Enda's National School

Science Policy

Introductory Statement

This document is a statement of the aims, principles and strategies for the teaching and learning of Science at St Enda's NS. It was developed through a process of consultation with the teaching staff, post holders and BoM. The policy was reviewed by all the above in 2018. A review of our Science policy takes place every three years.

Rationale

We have decided to implement this Science Policy for the following reasons:

- 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

Vision:

Science in our school aims to help children work scientifically to develop a broad range of skills of enquiry, to cultivate important attitudes and acquire scientific knowledge and concepts about the biological and physical aspects of the world.

Aims:

We hope to meet the aims of the Primary School Curriculum for science through the implementation of this plan throughout the school.

- 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 of, 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
- to provide opportunities for the children to observe and interact with their local environment and to observe the effects of seasonal change throughout the year in the school grounds, school garden and local areas where possible.
- To further use and develop the school garden for the benefit of all classes.

Content of Plan

Curriculum

Strands and Strand Units

Strands and Strand Units	Junior Infants	Senior Infants
Living Things		
Myself	<ul style="list-style-type: none"> • Growing and Changing 	<ul style="list-style-type: none"> • My Senses • We are Unique • New Life
Plants and Animals	<ul style="list-style-type: none"> • Animals and their Homes • The Cat Family • Animals and their young • The Hedgehog • Planting Seeds • River Wildlife 	<ul style="list-style-type: none"> • Birds in my locality • A tree through the seasons • Parts of a plant • How plants grow • Cactus
Energy and Forces		
Light	<ul style="list-style-type: none"> • Sorting Colours 	<ul style="list-style-type: none"> • Colours

Sound	<ul style="list-style-type: none"> Day and night Sounds I hear 	<ul style="list-style-type: none"> Shadows Making an instrument
Heat	<ul style="list-style-type: none"> Making Jelly 	
Magnetism and Electricity	<ul style="list-style-type: none"> Electricity 	<ul style="list-style-type: none"> Safety with electricity Magnets
Forces	<ul style="list-style-type: none"> Push and Pull 	<ul style="list-style-type: none"> Forces of Weather
Materials		
Properties and Characteristics of Materials	<ul style="list-style-type: none"> Materials at School Materials and Clothes 	<ul style="list-style-type: none"> Waterproof things Water Materials
Materials and Change	<ul style="list-style-type: none"> Waterproof materials Melting Chocolate 	<ul style="list-style-type: none"> Water
Environmental Awareness and Care		
Caring for my Locality	<ul style="list-style-type: none"> Nature Walk 	<ul style="list-style-type: none"> Caring for my Area Taking care of flowers

Strands and Strand Units	1 st Class	2 nd Class
Living Things		
Myself	<ul style="list-style-type: none"> Parts of the body Physical traits Growing and developing 	<ul style="list-style-type: none"> The skeleton My senses Food and growth Teeth Changes as we grow
Plants and Animals	<ul style="list-style-type: none"> Growing flowers Life cycle of a flower Seeds and trees Food The beach 	<ul style="list-style-type: none"> Trees Animals' sleeping habitats Hibernation Seasonal changes Birds around the world Life cycle of a plant Parts of an ant
Energy and Forces		
Light	<ul style="list-style-type: none"> Transparent and Opaque Sun safety 	<ul style="list-style-type: none"> Sources of light

Sound	<ul style="list-style-type: none"> • Loud and soft sounds • Pitch 	<ul style="list-style-type: none"> • Making an instrument
Heat	<ul style="list-style-type: none"> • Heat and temperature 	<ul style="list-style-type: none"> • Fires and fireworks • Temperature
Magnetism and Electricity	<ul style="list-style-type: none"> • Magnets • Static electricity 	<ul style="list-style-type: none"> • Using electricity
Forces	<ul style="list-style-type: none"> • Pushing and pulling • The force of wind • Floating and sinking 	<ul style="list-style-type: none"> • Water and energy • Pushing and pulling
Materials		
Properties and Characteristics of Materials	<ul style="list-style-type: none"> • Materials in my home • Natural and synthetic materials 	<ul style="list-style-type: none"> • Flexible materials • Materials for building
Materials and Change	<ul style="list-style-type: none"> • Baking • Heat and change • Mixing colours 	<ul style="list-style-type: none"> • Insulation
Environmental Awareness and Care		
Caring for my Locality	<ul style="list-style-type: none"> • Working animals 	<ul style="list-style-type: none"> • Importance of water • The environment • Litter awareness

Strands and Strand Units	3 rd Class	4 th Class
Living Things		
Human Life	<ul style="list-style-type: none"> • The skeleton • Teeth 	<ul style="list-style-type: none"> • Skin • The respiratory system • The heart
Plants and Animals	<ul style="list-style-type: none"> • Animals and habitats • Plants and habitats 	<ul style="list-style-type: none"> • Animals – mammals • Trees
Energy and Forces		
Light		<ul style="list-style-type: none"> • Light
Sound	<ul style="list-style-type: none"> • Sound and hearing 	
Heat	<ul style="list-style-type: none"> • Heat – changing and travelling • Temperature 	
Magnetism and Electricity	<ul style="list-style-type: none"> • Electricity – circuits 	<ul style="list-style-type: none"> • Magnetism

Forces		<ul style="list-style-type: none"> Pushing and pulling - Simple machines
Materials		
Properties and Characteristics of Materials	<ul style="list-style-type: none"> Materials in building and things Raw materials 	<ul style="list-style-type: none"> Rocks
Materials and Change	<ul style="list-style-type: none"> Heating materials 	<ul style="list-style-type: none"> Solids, liquids and gases
Environmental Awareness and Care		
Environmental Awareness	<ul style="list-style-type: none"> Reducing pollution 	<ul style="list-style-type: none"> Energy – renewable and non -renewable
Science and the Environment	<ul style="list-style-type: none"> Science and technology 	<ul style="list-style-type: none"> Inventions
Caring for the Environment	<ul style="list-style-type: none"> Working as a community 	

Strands and Strand Units	5 th Class	6 th Class
Living Things		
Human life	<ul style="list-style-type: none"> The digestive system The immune system 	<ul style="list-style-type: none"> Sight Hearing
Plants and Animals	<ul style="list-style-type: none"> Plants – aquatic plants, pollination Animals – sea, river and pond animals 	<ul style="list-style-type: none"> Plants <ul style="list-style-type: none"> Urban environments Rainforests Growing plants Animals <ul style="list-style-type: none"> Urban animals Spiders Snakes and frogs The food chain
Energy and Forces		
Light		<ul style="list-style-type: none"> Light Natural sources Speed of light

		<ul style="list-style-type: none"> - Rainbows, prisms, refraction
Sound	<ul style="list-style-type: none"> • Sound travelling • Echoes 	
Heat	<ul style="list-style-type: none"> • Solid, liquid, gases • Conduction and convection 	
Magnetism and Electricity	<ul style="list-style-type: none"> • Electricity 	<ul style="list-style-type: none"> • Magnetism
Forces	<ul style="list-style-type: none"> • Simple machines • Measuring forces • Forces and motion 	
Materials		
Properties and Characteristics of Materials	<ul style="list-style-type: none"> • Essential conditions for life • Properties of materials 	<ul style="list-style-type: none"> • Rocks and minerals • Inside the Earth • The rock cycle
Materials and Change	<ul style="list-style-type: none"> • Heat 	<ul style="list-style-type: none"> • Solids, liquids and gases • Mixtures
Environmental Awareness		
Environmental Awareness and Care	<ul style="list-style-type: none"> • Linked to geography topics 	<ul style="list-style-type: none"> • Linked to geography topics
Science and the Environment	<ul style="list-style-type: none"> • Linked to geography topics 	<ul style="list-style-type: none"> • Linked to geography topics
Caring for the Environment	<ul style="list-style-type: none"> • Linked to geography topics 	<ul style="list-style-type: none"> • Our environment – waste disposal and pollution • Sustainable energy

*Teachers working in our East Wing classes will use the above strands and strand units at the appropriate level for the individual children in their classes.

Children's Ideas

Children's ideas are regularly used a starting point for scientific activity. A selection of the following strategies are used to find out what the children already know about the topic:

- Brainstorming
- Concept Mapping
- KWL Chart
- Questioning
- Talk and Discussion
- Problem Solving Task

Practical Investigations

Practical investigations are encouraged in all classes. In planning for these investigations the teacher will allow for the differentiated needs of the class. In developing the scientific concepts teachers will be conscious of the need to relate these scientific concepts to the everyday experience of the children. This may be developed through the use of open and closed investigations and the engagement in free exploration of materials. In conducting practical investigations, the importance of conducting a fair test will be highlighted at all times.

Classroom Management

The teacher directed approach is used in class when demonstrating activities that may involve potential hazards and ensuring that safety practises are being applied. However the investigative approach is fostered in our school. Whenever feasible children are encouraged to work individually, in pairs or in small groups investigating and experimenting. Children may pursue their own investigations that allow them to pursue their own interests and ideas. Children have the opportunity to work together, share ideas and communicate their findings by working co-operatively and collaboratively.

The school has the following Science kits for the following strand units: Electricity; Magnetism; Forces; Heat; Sound and Light.

Classes also have access to a variety of materials to aid environmental awareness e.g. bug finders, binoculars, magnifying glasses etc. These resources are centrally located in our Eat Wing and readily available.

Key Methodologies

The key methodologies as outlined in the Primary Curriculum are used throughout the school. These include:

- 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
- Learning through language

We adapt and modify methodologies and activities to meet the needs and abilities of all children in the class.

Linkage and Integration

At all class levels there are opportunities to link activities across different areas of the Science curriculum. Teachers are encouraged to take a thematic approach where appropriate to SESE planning to allow integration between Science, History and Geography. There are also opportunities to integrate the teaching of Science with other Curriculum areas such as English, Maths, Art, Music etc.

An emphasis is placed on the explicit teaching of new scientific vocabulary needed by the children for science related activities. A conscious effort is made to develop children's language competence and confidence by providing opportunities to prepare and deliver science presentations.

Using the Environment

We incorporate our local environment in the implementation of the science curriculum. Particular emphasis is placed on the natural environment, such as local village, school grounds, school gardens, hedgerows and on the structural environment of the school itself. Children are encouraged to become involved in the enhancement of the immediate environment of the school grounds through active participation in designing the garden, maintaining its development and observing its plant and animal life. Our senior classes are also participate in the Junior Tidy Towns initiative under the direction of the Tidy Towns coordinators for the village of Ballycanew and their teacher.

Guest speakers are welcomed by the school to enhance and vary the learning of science in accordance with school policy. Teachers are also encouraged to take class groups on organised field trips outside of school premises as outlined in the school's guidelines.

We are an active participant in the Green Schools project having been awarded three Green flags and are currently working on obtaining our 4th under the theme of Transport. We incorporate our Green Schools policy into all areas of school life. The school actively participates in the recycling of paper, plastic bottles, cardboard, batteries and newspapers. The use of materials as a means of recycling in science and art/crafts activities is actively encouraged.

Balance between Knowledge and Skills

In implementation of knowledge and skills teacher attention will be drawn to the importance of developing skills in tandem with acquiring information. The skills to be developed are:

Observing

At all class levels children will be asked to compare and describe similarities and differences between objects. This will lead them to observing characteristics of familiar things, such as their shape, size, colour, pattern and texture.

Questioning

Questioning is used to help the child form links between previous and new experiences

Predicting

Pupils make predictions to forecast what might happen in certain circumstances

Investigating and Experimenting

Pupils will identify the materials required and may suggest approaches that will help carry out the investigation. Children will be encouraged to plan and ensure the test they are conducting is fair.

Recording and communicating

Children will record and communicate their observations and the results of their practical work through a variety of media, for example drawings, collage, written and oral reports, and through the use of information and communication technologies. Children will have opportunities to report to others through science week.

Analysing

Children will be encouraged to sort and classify information, recognise patterns and relationships, interpret information and offer explanations and draw conclusions from their exploration.

Children will be given an opportunity to use their science skills in structured and unstructured play/exploration and encouraged to make models. The concepts of making, planning and evaluating are at the heart of the designing and making process.

Assessment – Looking at Children’s Work

Assessment in science will assess the child’s knowledge and understanding of scientific matters, the acquisition of scientific skills and the cultivation of important attitudes. Assessment will be a continuous process and part of the normal teaching and learning situations. The children will be given opportunities to record their work in a variety of

different ways which include concrete materials, oral presentations, drawings, photographs, written records, projects, video recording and concept maps.

The following assessment tools are used to assess the children's knowledge, skills development and attitudes:

- Teacher observation
- Teacher-designed tasks and tests
- Work samples, portfolios and projects
- Curriculum profiles
- Questioning
- Concept mapping
- Self assessment

Parents are informed of their child's progress in science bi-annually, at parent/teacher meetings and through school reports and if deemed necessary at other times throughout the school year.

Children with Different Needs

We will use a number of techniques to provide a range of learning activities appropriate to the individual needs of pupils.

Forms of differentiation :

- Learning objectives
- Pace
- Teaching style
- Support
- Resource
- Task
- Outcome
- Grouping
- Other

Equality of Participation and Access

Our science policy is an all- inclusive policy which gives equal opportunities to all children to participate and integrate fully. In delivering the curriculum teachers are conscious of their obligations under the Equal Status Act to ensure students are not discriminated against in their work. With regard to pupils with a disability which impairs their full participation, every effort will be made following consultation with parents to ensure inclusion and optimum participation.

Organisational Planning

Timetable

At infant level two hours and fifteen minutes per week are allocated for SESE. From first class up the allocation is three hours per week. Depending on the topic and at the teacher's discretion, time can be blocked or extended. Science can also be incorporated into Aistear in the Junior classes.

Resources, Equipment and ICT

Internet access is available in all classrooms and an ICT timetable is in operation to allow each class access to our current supply of tablets and laptops each week. The school has a code of practice to ensure safe Internet usage and a chart outlining safe Internet usage is displayed in each classroom. Teachers familiarise themselves with material on websites prior to using them in the classroom. ICT can also be used to support the recording of children's responses to history.

Resources available in the school for science are stored in a central location in our East Wing and are easily accessible for individual classroom use.

Safety

Safety will permeate all aspects of the teaching of science. Throughout their science investigations children will be made aware of and encouraged to adopt safe practices. They will observe safety procedures in designing and making tasks, particularly when they are using tools and materials. Safety is also taken into account with regard to the storage of all scientific materials and equipment.

Individual Teachers' Planning and Reporting

This policy will inform individual teacher's long and short term planning. Teachers will plan using the strands and strand units and a thematic approach where appropriate. The Cúntas Miosúil will be used to record what has been taught and will inform our review and assessment for learning. This will contribute to our overall review of our science policy in 2021.

Staff Development

Through meeting invited guest speakers, tours, science weeks and recommended internet use, teachers knowledge and skills of science will continue to develop.

Parental Involvement

Parents are actively encouraged to support the teaching and learning of science through:

- Viewing the childrens' work
- Becoming involved in project work
- Participating from time to time in lessons/trips/displays
- Giving talks in their relevant areas of expertise

Community Links

We will encourage any local person who can support the science programme to visit the school.

Success Criteria

The following will indicate the degree of implementation and success of this plan.

- Teachers' preparation will be based on this plan
- Procedures outlines will be consistently followed
- Monthly reports will reflect this plan

The following are the indicators for the achievement of the plan's aims:

- Feedback from teachers/parents/pupils/community
- Inspectors' suggestions and reports

This science plan has promoted the key considerations for implementing the science curriculum.

Implementation

Roles and Responsibilities

This science policy was revised and updated and will be implemented from September 2018. Mary Kirwan Doyle will ensure each teacher will be able to view and print this new updated policy from the Science folder on the school NAS system. Science resources currently available in the school will be stored in the main storage room in the East Wing where all staff members have access.

Review

The Science Policy as a whole will be reviewed in 2021 by teachers, post-holders and BOM.

Ratification and Communication

Following ratification by the Board of Management, a copy of this plan will be available to parents and guardians on the school website.

Signed by:

Chairperson B.O.M

Principal

Date: _____