

Whole School Plan

For

Science



Scoil Naomh Peadar
Droichead Átha

St. Peter's N.S
Curriculum Policy Document
Science

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■ **Title:**

Science Plan for St. Peter's NS

■ **Introductory Statement and Rationale**

(a) Introductory Statement

This plan was formulated by the Principal and staff following introductory science in-service days, in-school planning days, environmental audit and PCSP Cuiditheoir visit.

(b) Rationale

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.

■ **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 believe that science should be a practical subject with hands-on activities that give an opportunity to develop scientific 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.

Aims: Aims: (Page 11 of Curriculum Statement)

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.

In addition we aim to:

- Continue to participate in the Green School Programme.
- Participate in Local Heritage Week.
- Take part in activities during National Tree Week and Energy Awareness Week-
- Organise existing equipment and purchase additional science resources as required during the two-year cycle beginning Autumn 2008
- Develop yearly plans with strand units divided in a 2-Year Cycle.
- Avail of future Cuiditheoir visits to give practical science demonstrations in the classrooms.

■ **Content of Plan**

Curriculum Content:

1 Science Programme:

1.1 Strands and Strand Units: (see 2-year plan and strand unit objectives appended.)

We have prepared a two-year plan for each class level, beginning Autumn 2008. We have included work from each strand for each year. Equal emphasis is given to each strand. A full range of objectives will be covered during the two-year cycle. 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:

We will use children's ideas as a starting point for all scientific activity.
The methodologies we will use include:

- ✓ Talk and discussion
- ✓ Open questions and problem-solving activities
- ✓ Annotated drawings
- ✓ Concept maps and brainstorming
- ✓ Free play with materials

We will promote the development of good questioning in our classrooms, with pupils as well as teachers being given the opportunity to pose their own questions and set up investigations to find answers.

1.3 Practical Investigations:

We will include the following investigations:

Open investigations - pupils will be given or may even suggest an open question for which they will have to design their own investigation and come up with their own results.

Closed investigations - activities where the end result is obvious and there are not many variables.

Fair testing - pupils will be encouraged to develop a sense of what should be kept the same and what should be the variable to ensure that an investigation is fair.

(see Teacher Guidelines pg 54)

1.4 Classroom Management:

A combined approach of whole classroom work, class work, small group work, paired work and individual work on chosen topics and projects will be used in each class. Children will be given opportunities to work together collaboratively and share their own ideas.

Each class will have a science display area.

We encourage both the investigative approach and the teacher-directed approach. Teachers will use their professional judgement to decide which methods and approaches are best suited to the needs of their pupils.

1.4 Key Methodologies:

We have identified the following as the key methodologies for science activity in our school:

- ✓ Active learning
- ✓ Free exploration of materials
- ✓ Use of everyday objects found in the local environment
- ✓ Outdoor habitat work - We will develop this during the year
- ✓ Content spiralling from class to class
- ✓ Talk and discussion

1.5 Linkage and Integration:

We encourage the linkage of the strands within science and the integration of science with other subject areas. Pupils' view of the world is a holistic one and as such more meaningful learning takes place in an integrated setting.

Examples include:

- Human Life units on growth and reproduction will integrate with SPHE
- Environmental awareness and care is closely integrated with the SPHE and Geography 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.

- The strand unit on Sound is an integral part of the music curriculum, e.g. designing musical instruments.

1.2 Using the Environment:
(see school environmental audit appended)

Each class will engage in designated habitat studies- see 2-Year Plan:
Our habitats include:

- ✓ Wall
- ✓ Concrete Areas / paths, etc.
- ✓ Grass
- ✓ Evergreen bushes
- ✓ Window boxes-bulbs, heathers, bedding plants

Habitat studies in our school will take into account the following:

- Seasonal study of individual habitats
- Outdoor investigation and exploration
- Sample collection within the school's conservation code
- Reference will be made to school's Safety Policy

In our habitat studies we will explore the following:

- Mini-beast studies
- Food chains
- Life cycles
- Adaptations
- Caring for the environment

1.3 Balance between Knowledge and Skills:

Pupils will be given an opportunity to engage in Design and Make activities appropriate to their ability and area of study. The children will be working in a scientific way, questioning, observing, predicting, investigating, analysing and recording and therefore acquiring knowledge. They will be exploring, planning and analysing materials through design and make activities e.g. lighthouses, quiz games, magnetic fishing game. There will be an emphasis on the promotion of scientific skills so knowledge will follow. This hands-on, practical approach will facilitate understanding of scientific topics.

2 Assessment – Looking at Children's Work:

Information from assessment will be communicated to parents in the school report at the end of the year and at the parent/teacher meetings in the first term. We will assess science:

- Knowledge
- Understanding
- Skills
- Attitudes towards investigation and problem-solving and sense of responsibility for environment

- Ability to work collaboratively

Assessment will be in the form of:

- teacher observation
- concept-mapping
- annotated drawing
- teacher-designed tasks
- portfolios of work
- Parental and pupil feedback

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.

3 Children with Different Needs:

Recording will be based on the child's level e.g. brainstorm and annotated drawings.

Activities will be differentiated according to ability.

ICT / digital images will be used to record work

Hands on practical work to suit all abilities

Assistance the Resource Teachers or Special Needs Assistants will be availed of when appropriate.

4 Equality of Participation and Access:

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

Organisation:

Timetable:

Science is part of the 3 hours of SESE in the senior classes and 2¼ hours SESE in the junior classes. Teachers may use discretionary time as and when needed.

5 Resources and Equipment: (See appended equipment list.)

We have included an equipment list from the PCSP. We have identified the resources already available in the school and undertake to purchase or collect the other resources as and when needed during the next two-year cycle. The equipment will be available in the school storage areas.

- 6 **Safety:**
(See safety statement)
- 7 **Homework:**
Science homework will be in accordance with the school's homework policy.
- 8 **Individual Teachers' Planning and Reporting:**
Yearly and short-term plans should be based on the approaches and methodologies set out in the school plan. Work covered will be outlined in the cúntas míosúil.
- 9 **Staff Development:**
Teachers are made aware of opportunities to attend science courses and training. Skills and expertise will be shared at staff meetings.
We have been facilitated by a science cuiditheoir and plan further visits.
- 10 **Parental Involvement:**
Parents are encouraged to support the school's science programme. Parents with particular expertise may be invited to address classes or accompany field outings when appropriate. Parents are invited to view science activities from time to time.
- 11 **Community Links:**
Local and national agencies are regularly invited to work with classes or address pupils. These include: Sustainable Energy Ireland, Green School's Co-ordinator, Green Finger's Club, heritage experts.

■ Success Criteria

We will measure the success of our plan by monitoring the following:

- Evidence of scientific skills and knowledge development in pupils throughout school
- Increased interest in science and environment throughout the school
- Evidence of practical activities in the classes
- Resources and equipment being used throughout the schools
- Class and school displays
- Evidence of classes engaging in outdoor habitat work
- Formal and informal assessment as outlined in this plan
- Positive feedback from parents and pupils

■ Implementation

(a) Roles and Responsibilities:

All teachers are responsible for the implementation of the science programme in their class and the care and maintenance of equipment. The principal will order additional equipment as and when the need arises.

(b) Timeframe:

Two-year cycle beginning September 2008.

■ Review

(a) Roles and Responsibilities:

Review will take place during the school year 2009/10 following the two-year cycle.

■ Ratification and Communication

This school plan for Science was ratified by the Board of Management of St. Peter's NS.

Signed:

Chairperson BOM

Principal:

Ratified on:

SCIENCE EQUIPMENT - BASIC LIST

LIVING THINGS AND ENVIRONMENTAL CARE

❖ **Animals and Plants:**

Magnifying bug boxes(10)

Hand lenses(30)

Top 50 garden birds (identification key)

Woodland name trail (identification key)

Flowers(identification key)

❖ **Myself**

Posters "Our body/skeleton

Wooden height chart

Mirrors(plastic)(10)

Feely bags(old shopping bags)

PLastic skeletons(pound shop at halloween)

ENERGY AND FORCES

❖ **Magnetism**

Small magnets(30)

Large Horseshoe magnets(4)

Wand magnets(30)

Sets of general materials in boxes (spoons, coins, bricks, Paper clips etc.)

Lids of shoe boxes (good for making magnetic mazes)

Sets of various materials(plastic, tinfoil, card etc. to investigate that magnets attract certain materials through other materials)

❖ **Light**

Strong Torches(15)(+batteries)

Plastic mirrors(40)

Coloured acetate sheets

Sets of materials for investigating transparent and opaque

Old shoe boxes(to investigate that light is needed in order to see)

❖ **Sound**

Large box of rubber bands

Large tuning fork

Small tuning fork

Shakers(music)

Balloons

❖ **Heat**

Classroom thermometers

A few outdoor thermometers

Some old trays/ plastic plates for melting ice.

❖ MATERIALS/FORCES

Large plastic tanks for water activities(floating/sinking etc.)

Plastic spoons

Beakers and spoons for mixing

Eggcups/ syringes for measuring amounts-pipettes could also be used

Salt, sugar, flour etc.

Samples of Cotton, Polyester, Wool Etc,

❖ Forces

Ramps can be made from old pieces of conduit or board (with various surfaces, rough, smooth etc.) and ladder(kept with senior materials)

Plastic trays

Elastic bands

Balloons and Pump

A variety of cars, lorries

10 green forcemeters (only up to 500g)

❖ Electricity

Sets of materials for static electricity(as in Materials)

Balloons

Old Electrical catalogues(argos)

10 ziploc bags each containing:

1 Battery +holder

1 Bulb +holder

2 wires bared at both ends

1 crocodile lead

1 screwdriver

1 large steel nail

Junior & Senior Infants Class

Year 1

(Numbers refer to Content Objectives in the Curriculum.)

	Living Things	Energy & Forces	Materials	Environmental Awareness & Care
September	Myself (1,2, 6)			
October	Plants & Animals			Caring for my locality
November			Properties & Characteristics (1-3)	
December		Light		
January		Heat	Materials & Change: Heating & Cooling (4)	
February	Plants & Animals			
March		Magnetism (1-2)		
April				Caring for my locality
May		Forces: Floating & Sinking (3)		
June	Plants & Animals			

Junior & Senior Infants Class -

Year 2

(Numbers refer to Content Objectives in the Curriculum.)

	Living Things	Energy & Forces	Materials	Environmental Awareness & Care
September	Myself (3-5)			
October	Plants & Animals			Caring for my locality
November			Properties & Characteristics (4,5)	
December		Electricity (3-5)		
January			Materials & Change: Wet & Dry (1-3)	
February	Plants & Animals			
March		Sound		
April				Caring for my locality
May		Forces: Pushing & pulling (1,2)		
June	Plants & Animals			

First & Second Class

Year 1

(numbers refer to content objective in curriculum)

	Living Things	Energy & Forces	Materials	Environmental Awareness & Care
September	Myself (1-3, 8)			
October	Plants & Animals			Caring for my locality
November		Light		
December			Properties & Characteristics (1-3)	
January		Magnetism (1-3)		
February	Plants & Animals			
March		Forces: Floating & Sinking (4)		
April				Caring for my locality
May		Heat	Materials & Change: Heating & Cooling	
June	Plants & Animals			

First & Second Classes

Year 2

(numbers refer to content objective in curriculum)

	Living Things	Energy & Forces	Materials	Environmental Awareness & Care
September	Myself (4 -7)			
October	Plants & Animals			Caring for my locality
November		Sound		
December			Properties & Characteristics (4-6)	
January		Forces: Pushing & pulling (1-3)		
February	Plants & Animals			
March			Materials & Change: Mixing & other changes	
April				Caring for my locality
May		Electricity (4-7)		
June	Plants & Animals			

Where strand units are split over two years, suggestions for a possible division of the objectives is given in brackets

Third & Fourth Class

Year 1

	Living Things	Energy & Forces	Materials	Environmental Awareness & Care
September	Human life (1-3)			
October	Plants & Animals			Caring for the environment
November			Properties & Characteristics (1-3)	
December		Magnetism (1-5)		
January		Forces: (1-3)		
February	Plants & Animals			
March		Heat	Materials & Change: Heating & Cooling	
April				Environmental awareness
May		Light		
June	Plants & Animals			

Third & Fourth Class

Year 2

	Living Things	Energy & Forces	Materials	Environmental Awareness & Care
September	Human life (1,4,5)			
October	Plants & Animals			Caring for the environment
November			Properties & Characteristics (4-6)	
December		Forces: (4-6)		
January		Sound		
February	Plants & Animals			
March		Electricity (6-11) Learn about electrical energy Investigate current electricity by constructing simple circuits. Use wire, bulbs and batteries Experiment with simple switches <i>Design and make a marine warning system (e.g. buoy with light or buzzer, lighthouse)</i>		
April				Science and the environment
May			Materials & Change: Mixing & other changes	
June	Plants & Animals			

Fifth & Sixth Class

Year 1

	Living Things	Energy & Forces	Materials	Environmental Awareness & Care
September	Human life (1-3)			
October	Plants & Animals			Caring for the environment
November		Magnetism (1-3)		
December			Properties & Characteristics (1-5)	
January		Heat	Materials & Change: Heating & Cooling	
February	Plants & Animals			
March		Light		
April				Environmental awareness
May		Forces: (1-3)		
June	Plants & Animals			

Fifth & Sixth Class

Year 2

	Living Things	Energy & Forces	Materials	Environmental Awareness & Care
September	Human life (1,4,5)			
October	Plants & Animals			Caring for the environment
November		Sound		
December			Properties & Characteristics (6-9)	
January			Materials & Change: Mixing, separating & other changes	
February	Plants & Animals			
March		Forces: (4-6)		
April				Science and the environment
May		Electricity (4-7)		
June	Plants & Animals			

Where strand units are split over two years, suggestions for a possible division of the objectives is given in brackets