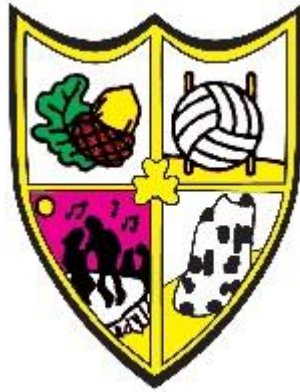


Clocha Rince NS



Science Whole School Plan

Planning Template: Science

■ Title: Whole School Plan for SESE Science – a work in progress

■ Introductory Statement and Rationale

(a) Introductory Statement

This plan was formulated by the teaching staff in the school during 2012/2013 year. It has arisen after a process of staff consultation and curriculum research. It was ratified by the Board of Management at a meeting on Thursday 20th June 2013.

(b) Rationale

We focussed on this area of planning to ensure that the revised guidelines for science are being implemented in our school in an organised, coherent and accountable manner. This plan will benefit the teacher by informing class planning and teaching and will provide the pupils with adequate opportunities to develop skills and understanding of concepts as envisaged by the science curriculum.

■ 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 physical and biological world and environments around them. We believe that science should be a practical subject with opportunities to engage in hands-on investigative work. To this end, we will consciously develop children's scientific skills as well as their scientific knowledge. Environmental activities will foster a positive attitude and a sense of responsibility among our pupils for the natural and human environments.

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.

(b) In addition we aim to:

- Work towards achieving the green flag
- Participate in Discover Primary Science
- Develop and Maintain Science resources

Curriculum Planning

1. Strands and Strand Units:

We have prepared a two-year plan for each class level.

We have included work from each strand for each year and will cover all strand units over a 2 year period.

In the plan we have included a range of habitat studies based on our immediate environment for each class grouping. We will use a balanced mix of theme-based approach to SESE, cross-curricular work and subject-centre focus.

Junior Infants

Term	Strand Unit	Content	Curriculum	Teacher Guidelines
Autumn	<p>Myself</p> <p>Caring for my Locality</p>	<p>Body – similarities/differences</p> <p>Body – changes as we grow</p> <p>Observe and appreciate attributes of our locality</p> <p>Develop a sense of responsibility for its care</p> <p>Implement simple strategies for its improvement and care</p>	Page 24	Page 118 121
Winter/Spring	<p>Magnetism and Electricity</p> <p>Forces</p>	<p>Purposeful play with magnets to observe effect</p> <p>Use of electricity at home/school</p> <p>Dangers of electricity</p> <p>Investigate the effects of pushing and pulling of various objects</p>	<p>Page 26</p> <p>26</p>	Page 38, 108, 109, 136, 138

Summer	Properties and characteristics of materials	Investigate materials and their uses in our surroundings Grouping materials under different criteria – include magnetism, absorbency, etc Investigate the uses of these materials in construction	Page 46	Page 126
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Rang 2

Term	Strand Unit	Content	Curriculum	Teacher Guidelines
Autumn	Plants and Animals	Investigate living things in various habitats Investigate parts of living things Grouping living things by characteristics, e.g. migration Explore the conditions needed for growth and change, e.g. heat, light.. Explore life cycles of plants and animals	Page 42	Page 48, 62, 64, 68, 70, 73, 78, 80, 82
Winter/Spring	Light Sound	Explore sources and importance of light Observe transparency of materials to light Importance of the sun for light, heat Learn dangers of the sun, eyes, skin etc Investigate various sounds and how to make these sounds Develop percussion instruments	Page 43	Page 38, 108, 109, 136, 138
Summer	Heat	Explore various sources of heat: sun, fire, radiator Investigate how to measure heat	Page 44	Page 125, 126

		<p>Measure and compare temperatures</p> <p>Observe effects of heating/cooling solids and liquids</p> <p>Explore how to maintain temperature</p> <p>Mixing materials and the effects, eg paint</p>		
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Rang 3

Term	Strand Unit	Content	Curriculum	Teacher Guidelines
Autumn	<p>Human Life</p> <p>Environmental Awareness</p>	<p>Body – name external and internal organs</p> <p>Discuss need for balanced diet</p> <p>Examine the breathing system, lungs, smoking</p> <p>Examine the skeletal system, muscles, bones, joints</p> <p>Observe, discuss and record elements of our local environment</p> <p>Renewable/non-renewable resources</p> <p>Conservation of our environment</p> <p>Implementing anti-pollution schemes</p> <p>Identify issues and responsibilities through debate/action</p>	<p>Page 61</p> <p>Page 68</p>	<p>Page 119, 122</p>

	Caring for the environment		Page 68, 70	
Winter/Spring	Magnetism and Electricity	<p>Push/pull effects- terms attract/repel are introduced</p> <p>Classification into magnetic/non-magnetic</p> <p>Link magnets to the compass</p> <p>Static electricity</p> <p>Uses/dangers of electricity at home/school</p> <p>Construction of simple circuits</p> <p>Identify conductors/insulators</p>	Page 64	Page 102-103
	Forces	<p>Movement of objects – push, pull/stretch, pulley, roll...</p> <p>Slowing moving objects due to friction, e.g. ball on carpet</p> <p>Investigate gravity</p> <p>Levers- designing levers, see-saw</p> <p>Floating/sinking of objects</p>	Page 65	Page 112, 114, 136, 138
Summer	Properties and Characteristics of materials	<p>Investigate properties of various materials</p> <p>Discuss solids, liquids, and gases</p> <p>Raw v. manufactured materials</p> <p>Grouping of materials under specific criteria, include insulators/conductor, magnetic, absorbency</p> <p>Discuss uses of these materials in construction</p>	Page 66	Page 127

Winter/Spring	Magnetism and Electricity Forces	<p>Push/pull, attract/repel, lift/hold effect of magnets</p> <p>Investigate making magnets – the electromagnet</p> <p>Construct a variety of simple circuits</p> <p>Uses/dangers of electricity</p> <p>Movement of objects – push, pull, pulley, wind, water..</p> <p>Effects of friction – slowing objects and generating heat</p> <p>Introduce gravity as a force</p> <p>Use of levers to lift, turn</p> <p>Design</p>	<p>Page 86</p> <p>Page 87</p>	<p>Page 102,103, 104</p> <p>Pages 40-41</p> <p>114, 116, 136, 138</p>
Summer	Properties and Characteristics of materials	<p>Solids, liquids, gases, their properties</p> <p>Investigated and group different materials, including oxygen</p> <p>The decay of various materials</p> <p>Composition of our air – its properties</p> <p>Different gases in our environment and everyday uses</p>	Page 88	Page 127

Rang 6

Term	Strand Unit	Content	Curriculum	Teacher Guidelines
Autumn	Plants and Animals	<p>Investigate living things in various habitats</p> <p>Explore conditions of growth and how animals adapt to environments</p> <p>Uses of keys in the identification of species</p> <p>Explore food chains and life cycles</p> <p>Explore characteristics of specific</p>	Page 84	Page 62, 64, 66, 68, 70, 78, 82

		<p>groups, e.g. mammals, birds, fish</p> <p>Explore conditions of growth in detail including reproduction</p> <p>Explore technology in the everyday context</p> <p>Identify the positive/negative effects of technology on our environment</p> <p>Look at technology and important scientists/inventions in our world</p>	Page 91	
	Science and the Environment			
Winter/Spring	Light	<p>Characteristics of light – energy form, spectrum, reflection, refraction</p> <p>Uses of lens.</p> <p>Importance of sight</p> <p>Importance of the sun – photosynthesis</p> <p>Dangers of sunlight</p>	Page 85	Page 95
	Sound	<p>Characteristics of sound – vibration, energy, travel, travel through materials</p> <p>Making fo sound through percussion, vibration</p> <p>Importance of hearing</p>	Page 85	
Summer	Heat	<p>Use/explanation of terms conduction, convection, radiation</p> <p>Transfer of heat, sources, renewable,</p>	Page 86	Page 128

	Materials and change	non-renewable heat Use of thermometer Effects of heating/cooling on solids, liquids and gases Conductors and insulators of change Mixing, separating and dissolving of materials Testing of materials under different criteria, e.g. use of water, force Fire triangle – oxygen, fuel, heat. Heat at home	Page 89	
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2. Children's Ideas:

We will use childrens' ideas as a starting point for all scientific activity

Strategies we will use to elicit children's ideas are

- **Talk and dicussion**
- **Open and closed questioning**
- **Annontated drawings**
- **Concept maps**
- **Concept cartoons**
- **Brainstorming**
- **Free play with materials**

3. Practical Investigations:

When planning practical investigations we will use

- **Open Investigations: Pupils are given or may suggest an open question for which they have to design their own investigtion**
- **Closed Investigations: Pupils will engage in activities where the end result is obvious and there are not many variables.**
- **Fair Testing: Pupils develop a sense of what should be kept the same and what should be variable to ensure that an investigation is fair.**

We will consult the Teacher Guidelines pg 54 in this regard.

4. Classroom Management:

A combined approach of whole class work, small group 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.

Teachers will use their professional judgement to decide which methods and approaches are best suited to the needs of their pupils.

5. Methodologies:

We plan to use the key methodologies of the Primary Curriculum in the teaching of Science :

- **Active learning**
- **Problem solving**
- **Developing skills through content**
- **Talk and discussion**
- **Co-operative learning**
- **Use of the environment.**

We have also identified the following as methodologies particular to Science and will employ them where possible as a central element of the key methodologies.

- **Free exploration of materials**
- **Use of everyday objects and materials in the environment**
- **Outdoor investigation and Fieldwork**
- **ICT**

Methodologies we have identified for development are:

- **Outdoor investigation and Fieldwork**
 - **ICT**
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6. Linkage and Integration:

We encourage the linkage of strands within the science curriculum and the integration of science with other subject areas.

- **Human Life units on growth and reproduction will integrate with SPHE**
- **Environmental awareness and care is closely integrated with the SPHE and Geography curricula.**
- **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,**
- **The strand unit on sound is an integral part of the Music curriculum e.g. Sounds in the environment and the designing of musical instruments.**
- **Various “line of Development” studies in History will lend themselves meaningfully to scientific investigation, e. g Clothes over the years and Materials**

7. Using the Environment

We have a completed an environmental audit of the school grounds and the surrounding Locality.

Each class will engage in designated habitat studies: (Examples)

Also used for Geography: Natural Environment: the local natural environment

Junior Infants	Senior Infants	Rang 1	Rang 2	Rang 3	Rang 4	Rang 5	Rang 6
School Gardens & Buildings	Seomra Glas	Peatland Clonbullogue	Donadea Forest	Rahan Wood	Royal/Gr and Canal	Lullymore Bog	Nurney Organic Farm

8. Balance between Knowledge and Skills:

Science is not only concerned with the acquisition of knowledge but the understanding of concepts. We can nurture this understanding by developing skills of questioning, observing, predicting, investigating, analysing and recording and therefore acquiring knowledge. Children will explore, plan and analyse materials through design and make activities. Pupils will be given an opportunity to engage in Design and Make activities appropriate to their ability and area of study.

9. Assessment – Looking at Childrens' Work:

In science we will assess

- Knowledge
- Understanding
- Skills
- Attitudes
- Ability to work collaboratively

Assessment will be in the form of

- Teacher observation
- Concept-mapping
- Annotated drawings
- Teacher-designed tasks and tests
- Portfolio and project work
- Self- Assessment Learning Folders

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 the year and at the parent/teacher meetings.

10. Children with Special Educational Needs:

It is important that all children experience a rounded environmental education. Science plays a pivotal role in this education and so we will do our best to ensure that every child will have opportunities to engage in learning activities appropriate to their abilities.

- **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 findings in a variety of ways.**
- **SNA support, where applicable, for particular children or groups as directed by class teacher.**

All teachers will familiarise themselves with the Guidelines for Children with General Learning Difficulties (NCCA)

11. Equality of Participation and Access:

Refer to school's Equality Policy

***Boys and girls will be have equal opportunities to participate in science lessons and activities.**

***Equal opportunity will be given to boys and girls to experience all strands.**

***Provision will be made for children experiencing any form of disadvantage or whose first language is not English**

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

Organisational Planning

12. Timetable

In keeping with the recommendations in the Primary School Curriculum Introduction (page 70) a minimum of two and quarter hours per week is devoted to SESE in infant classes and a minimum of three hours per week for classes 1st to 6th.

45 minutes of this time will be spent on Science in infants

One hour of this time will be spent on Science in 1st and 2nd

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

- **working on a integrated project**
- **exploring the local environment**

Teachers will use discretionary curriculum time (2 hours per week) for SESE as appropriate.

13. Resources and Equipment:

- We have attached a list of our current resources for science to this plan.
- Equipment and resource materials will be held in the Resource Room ‘Science Trays’.
- The equipment will be checked and updated at the end of each year by post-holder for resources.
- Any equipment purchases will be organised by the post-holder in consultation with the staff needs and requirements.
- The school encourages the use of science websites providing this is within the safe use of the internet guidelines- see attached list of websites
- We have completed an environmental audit of the immediate locality and have decided how to use it as a resource.
- We will not use Textbooks as the primary resource. We aim to phase out the listing of SESE textbooks on the ‘School Booklist’. A stock of appropriate textbooks will be compiled and used as a resource when appropriate.
- Environmentalists in the community will be asked to talk to the children and share their knowledge with them. (Dick Warner, Ferga Kenny, Michael Jacob)

Extra resources will be acquired according as funding is made available.

14. Health and Safety

We have a Health and Safety policy in place in our school which covers safety concerning the handling of equipment and out of school activities such as fieldwork (See Geography Teacher Guidelines P 74 – 78 for guidance on such a policy)

Teachers will consult the Principal whenever it is proposed to engage in fieldwork.

During practical work teachers will be aware of the safety implications of any exploratory or investigative work to be undertaken. Successful and enjoyable investigations require sensible planning, good supervision and adherence to safety rules.

Outdoor work will be based in areas that are accessible for children, teachers and helpers and that are safe. Preliminary visits by teachers to the site will be necessary to identify potential hazards. If there are apparent dangers then a more suitable habitat will be selected for study. Habitat studies involve children in working with plants and animals, and teachers will be made aware that some children may be allergic to some animals and plants.

When designing investigative activities teachers will find useful safety advice in the *Teacher Guidelines for Science* and in *Safety in School Science* (*An Roinn Oideachais 1996*).

15. Individual Teachers' Planning and Reporting:

Teachers will consult this Whole School Plan and the curriculum documents for Science when they are drawing up their long and short term plans.

Teachers will include all the strands and strand units every year and will select objectives within the strand units each year. Staff teaching the same class level will decide collaboratively on objectives chosen and will inform subsequent teachers of content covered to ensure continuity in our spiral curriculum.

Where it is meaningful and suitable Geography will be taught in a thematic way to integrate with the other SESE subjects of History and Science.

Cúnais Míosúil will assist in recording work covered , in evaluating progress in Science and in informing future teaching.

16. Staff Development:

- Teachers will have access to reference books , resource materials and websites dealing with Science .
- Staff will be encouraged to research and try out new approaches and methodologies.
- Post-holder with responsibility for resources will be responsible for keeping resource material up to date and will arrange for opportunities for resources to be assessed for purchase.
- Teachers will be encouraged to attend inservice workshops and courses on Science in order to enhance their understanding and teaching of the subject. They will upskill other staff in what they have learned by sharing the expertise acquired at these courses during staff meetings.
- The culture in our school is one that encourages the sharing of experience and good practice.

17. Parental Involvement:

Parents are invited to celebrate and view results of projects, surveys, investigations in the school or read about them in the school newsletter. A Science Day will be held at least every second year. The Post-holder with responsibility for Science will organise this.

18. Community Links:

- People in the local community who have an interest and knowledge in the environment will be invited to speak to the children.
- The Clocha Rince Community Library will be a source of knowledge for the children.
- The work of some national agencies relates to aspects of the Science programme. As well as accessing materials produced by these agencies specifically for schools , we will welcome visits by speakers from these organisations.

Tree Council

Sustain Energy Ireland

Green Schools

Bird Watch Ireland

■ Implementation

(a) Roles and Responsibilities:

The plan will be supported , developed and implemented by all staff members.

Post-holder with responsibility for Science will arrange for;

- Scientific audit of school grounds and immediate locality.
- Fieldwork trails and packs.
- Purchase, maintenance and storage of resources.
- Leading the development of new methodologies identified.
- Liaising with community organisations and relevant agencies.
- The development of ICT as a learning tool in Science and the vetting of websites.

■ Review

It will be necessary to review this plan on a regular basis to ensure optimum implementation of the Science curriculum. This Plan will be reviewed during the 2013/2014 school year.

■ Ratification

This policy was ratified by the Board of Management at a meeting on 20th June 2013.

Resources required for the Science Programme

Living Things : Myself/Human Life

- Mirrors – plastic
- Metre sticks
- Height chart
- Thermometer
- Measuring tape
- Bathroom scales

Living Things : Animals and plants

- Flower pot
- Insect cages
- Small trowels
- Aquarium tank
- Old spoons
- Sheets of Perspex or plastic
- Watering can
- Plastic tubing
- Hand lenses
- Nature viewers
- Microscope
- Binoculars
- Magnispectors
- Bird table

Energy and Forces : Magnetism and Electricity

- Magnets – including bar, button, horseshoe
- Screw in light bulb holders
- Bulbs and batteries
- Iron filings
- Crocodile clips
- Needles
- Wires
- Compasses
- Electric buzzers
- A range of magnetic materials
- Electric bells
- Electric motor
- A selection of metals
- Wire stripping pliers
- Steel wool
- Screwdrivers

Energy and Forces : Light

- Torches
- Curved mirrors and Plane mirrors
- Glass blocks and triangular prism
- Shiny objects that will act as mirrors; spoons, biscuit tin lid, sheet metal
- Transparent, translucent and opaque materials
- Colour filters
- Candles
- Old spectacle lenses
- Projector

Energy and Forces : Heat

- Thermometers
- Candles
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Energy and Forces : Sound

- Tuning forks
- Rubber bands – different sizes and thickness
- Guitar strings

Energy and Forces : Forces

- wheeled toys
- Oil, grease, polish, wax
- Inclined plane
- Sandpaper
- Springs
- Mechanisms: tongs, pliers, nutcrackers, toys, old clock etc
- Weights
- Marbles
- Balls
- Construction sets such as Meccano, wheels, pulley, axle rod, gears
- Timers
- Stop clock and watches
- Balloons
- Plastic syringes
- Pulleys

Materials

- Funnels
- Polystyrene sheets, blocks, balls and beads
- Sieves, plastic, various meshes
- samples of fabrics and fibres
- Food colouring
- Samples of soap and detergent
- Dyes
- Materials from the kitchen or bathroom such as sugar, salt, soda, chalk, oil, soda water, lime water, tea, coffee, bath salts, flour
- Samples of different metals
- Pebbles, stones, bricks and rocks
- Samples of different woods and wood products
- Samples of different papers, blotting paper, tissue paper, paper towels, waxed paper, greaseproof paper, newsprint
- Corks

Equipment and materials required for designing and making

- Construction kits such as Lego Technic, K’Nex, Fischer Technik, Meccano, Master Builder
- Mechanisms – egg beater, bicycle pump, jack, hinges, toys etc
- Hammer and nails
- Nuts and bolts
- Hacksaw and spare blades
- Wood glue
- Clamp
- Sandpaper
- Screwdriver and screws
- Craft Knife
- Hand Drill
- Ruler and Scissors

- Clips
- Spanners
- Needle
- Rotary Cutter
- G Clamp

Consumable Materials

- Plasticine
- Plaster of Paris
- Clay
- A range of fabrics and fibres
- Fasteners – bulldog clips, paper clips, hair clips, clothes pegs
- Soft woods
- Foil
- Metals
- Acetate
- Plastic
- Rubber
- Dowels of various lengths and thickness
- Thin wire
- String and threads
- Adhesives
- Paints

Domestic Reclaimable Waste

- plastic bottles of various sizes
- plastic straws
- aluminium foil
- thread spools
- tins
- range of empty boxes, lids, containers and tubes
- coat hangers
- polystyrene block and beads
- scrap cord and board
- corks of varying sizes