**Science**

# Introductory Statement

This document is a statement of the aims, principles and strategies for the teaching and learning of Science at Lumcloon 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 2019. 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 emphasizes 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*

| Outline Of scheme of work – Junior, Senior, First and Second | | | | |
|---|---|---|---|---|
| **Strands** | **Strand units** | | **2018/2019** | **2019-2020** |

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|---|---|---|---|---|
| **Living things** | Myself | Variety and characteristics of humans | Parts of the body | The senses- Touch<br><br>The skin<br><br>Teeth |
| | | Human life processes | Changes as we grow and mature<br><br>Human life cycles | |
| | Plants and animals | Variety and characteristics of living things | The school garden<br><br>The dandelion<br><br>Australian animals | The school garden<br><br>Common fruits (Picking fruit and making blackberry and pear crumble)<br><br>The spider<br><br>Animals living in the local habitat<br><br>Artic animals (Penguin and the Polar bear) |
| | | Processes of life | Growing of seeds<br><br>Butterfly-Garden | Chickens |
| **Energy and forces** | Light | | Day and night - shadows | Light sources relationship between light and materials (transparent/ opaque) |

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| | Sound | | High and low sounds<br><br>Exploring ways of making sounds | Design and make percussion instruments |
| | Heat | | Hot and cold weather | Temperature (measure and compare temperature in different environments) |
| | Magnetism | | | Investigate magnets and materials they attract |
| | Forces | | Pushing and Pulling: The Giant Turnip | Floating and sinking |
| | Electricity | | Uses of electricity in homes and school | Dangers of electricity<br><br>Effects of static electricity |
| **Materials** | Properties and characteristics of materials | | Investigate materials for different uses (clothes suitable for different types of weather) | Transparent v opaque<br><br>Sorting materials based on properties and uses<br><br>Waterproof materials |
| | Materials and change | Heating and cooling | Effects of heating and cooling on solids (Rice Krispy buns) | |

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| | | Mixing and other changes | | Investigate how materials may be changed by mixing and cooling<br>(Vegetable soup from school garden) |
| **Environmental awareness and care** | Caring for my locality | | Nature walk | Nature walk<br>Become aware of ways in which the environment can be polluted or harmed. |

| **Outline Scheme of Work – Third, Fourth, Fifth and Sixth Class** | | | | |
|---|---|---|---|---|
| **Strands** | **Strand Units** | | **2018/2019** | **2019/2020** |
| **Living things** | Human Life | Variety and characteristics of humans | Hail to the Heart<br>A Healthy Heart<br>My Beating Heart | Body Facts<br>Smelling, Tasting, Touching |
| | | Human life processes | Sight and Hearing<br>Brilliant Bones<br>3-D Vision | Where Food Goes<br>On the Outside: Skin and Hair<br>Seeing and hearing<br>Food and Nutrition<br>Human Life Cycle |
| | Plants and animal life | Variety and characteristics of living things | Animal Groupings<br>Invertebrates<br>Usual and Unusual Plants | A Year in the Life of a Tree<br>Grow a Tree<br>Marine Mammals |
| | | Processes of life | Bursting into Flower | The Housefly<br>Planting Seeds |

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| | | | How Animals See | |
| **Energy and forces** | Light | | Blue Skies and Golden Sunsets | Bending Light |
| | Sound | | A Sound Idea<br>Hello! Hello! | Sound Waves |
| | Heat | | Heat | Heat and Friction |
| | Magnetism and electricity | | A Little Light Work | A Lemon Juice Battery<br>Magnets and Motors |
| | Forces | | Hoist Away – Simple Pulleys | In a Spin<br>Finding a Balance<br>Will it Float<br>Liquid Density (Lava Lamps) |
| **Materials** | Properties and characteristics of materials | | Old Flames<br>Burning Oxygen | Moving Air<br>Air pressure<br>Surface tension |
| | Materials and change | | Baking Cakes | Chemical Reactions<br>Acid vs Base |
| **Environmental awareness and care** | Environmental awareness | | Eco Holiday | Bog Trail |
| | Science and the environment | | Oil Spill Clean-up<br>Environmental Science | Organising and re-using Waste Materials |

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| | Caring for the environment | | Helping the Environment | Solar Still<br>Renewable Energy |

*Teachers working in our ASD 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 practices 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.

Classes also have access to a variety of materials to aid environmental awareness e.g. bug finders, magnifying glasses etc.

## 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.

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 two Green flags and are currently working on obtaining our third under the theme of Water. 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
- Questioning
- Concept mapping
- Self-assessment

Parents are informed of their child's progress in science, 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 outcomes
- 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 the kitchenette in the old school building 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 children's' 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 2019. Niamh Keenan will ensure each teacher will be able to view and print this new updated policy from the Science folder on the shared Teachers' Drive on Google Drive. Science resources currently available in the school will be stored in the main storage room in the kitchenette in the old school building 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: 09/05/2019