

Science Plan

Kilbonane National School
Knocknahilan
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Policy Statement on Science

1. Introduction

This programme was put in place to facilitate the staff in delivering a suitably broad and balanced science curriculum throughout the school - in which undue repetition and significant gaps are avoided. In keeping with the DES guidelines we want to ensure continuity of approach throughout the school. This plan is a record of whole school decisions in relation to Science in line with the Primary Curriculum 1999. It is intended to guide teachers in their individual planning for Science.

2. Vision

The study of Science in our school is concerned with the development of knowledge and understanding of the biological and physical aspects of the world. We aspire to help pupils reflect critically to make sense of their experiences. We promote learning activities that foster the pupils' curiosity and enjoyment so that they will develop a lasting interest in Science. Practical activities, focussing on the scientific process, are included as an important part of the Science lesson. Teachers will have opportunities for professional development in the area of science through in – service training and summer courses. In this school year we hope to explore, Body Systems, Plants and animals, Electricity, Magnetism.

3. Aims

- 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
- To encourage the child to explore, develop and apply scientific ideas and concepts
- To foster the child's natural curiosity
- To aid the child to appreciate the contribution of science and technology to the wider world
- To appreciate and respect diverse living and non-living things
- To encourage the child to become environmentally responsible and aware
- To enable the child to communicate ideas, present ideas and report findings using a variety of media

4. Key Considerations

- Children's Ideas
- Practical Investigations
- Classroom Management
- Key Methodologies
- Linkage and integration
- Using the environment
- Balance between knowledge and skills
- Resources and equipment
- Broad and balanced
- Looking at children's work
- Safety

Content of Plan

Science Programme
Curriculum Planning

Strands and Strand Units:

The curriculum content is divided between the two classes ensuring that all four strands are covered each year

- Living things
- Forces and energy
- Materials
- Environmental awareness and care

The content and knowledge to be explored by the pupils are outlined in the four content strands and through the study of these areas the scientific and technological skills described in 'Working scientifically' and 'Designing and making' are developed

Teachers select the topics/lesson from the menu of curriculum objectives for their classes ensuring that equal emphasis is given to each strand and that the full range of objectives are covered. Thematic approaches are adopted at certain stages of the year. Certain aspects of the Science programme that relate to human growth, development and reproduction are addressed in line with the school's plan for SPHE and RSE.

Strand

Infant Classes
Strand Units

1st & 2nd
Strand Units

Living Things	Myself Plants and Animals	Myself Plant and Animals
Energy & Forces	Light Heat Sound Forces Magnetism Electricity	Light Heat Sound Forces Magnetism Electricity
Materials	Properties & Characteristics of Materials Materials & change	Properties & Characteristics of Materials Materials & change
Environmental awareness and Care	Caring for my locality	Caring for my locality

Strand	3 rd & 4 th Strand Units	5 th & 6 th Strand Units
Living Things	Myself Plants and Animals	Myself Plant and Animals
Energy & Forces	Light Heat Sound Forces Magnetism Electricity	Light Heat Sound Forces Magnetism Electricity
Materials	Properties & Characteristics of Materials Materials & change	Properties & Characteristics of Materials Materials & change
Environmental awareness and Care	Science & the Environment Environmental Awareness Caring for the Environment	Science & the Environment Environmental Awareness Caring for the Environment

5. Children's Ideas

All teachers are in agreement that learning in Science begins from the pupils' ideas about how things are, and they change and develop these ideas by testing them in practical investigations. During scientific activities children are encouraged to discuss, question, listen and problem solve through activities that try out, challenge, change or replace ideas

6. Practical Investigations

Teachers adopt an investigative approach or direct scientific activity to ensure that the pupils are provided with opportunities to use and apply concepts while solving scientific problems. The concept of a fair test is introduced from 3rd class with children encouraged to identify the conditions that make a difference to an experiment. In carrying out practical investigations in Science the children will be involved in

- Observing
- Asking Questions
- Predicting
- Hypothesising
- Investigating and experimenting
- Interpreting results
- Recording and communicating results

An important aspect of scientific activity is Designing and Making. Children are to be encouraged to design and make artefacts and models that will provide solutions to practical problems. The skills to be developed for this facet are:

- Exploring
- Planning
- Making
- Evaluating

7. Classroom Management

Teachers may use a variety of strategies when structuring the Science lesson e.g. whole class work, group work and individual work on chosen topics. Safety procedures as referred to in Section 7 must be followed. An inventory has been made of resources and these are stored in a press in the seomra mór. Teachers must ensure that materials are returned when the lesson is completed. Projects will be displayed in the classroom.

8. Key Methodologies

It is essential, no matter what our collective experience in teaching the subject that we use a range of teaching methods and approaches when teaching Science. Lessons “should not be work card or textbook based”. Our main aim is to get the children “thinking scientifically” and not memorising facts to be regurgitated at a later stage. The approaches adopted should create a learning environment where:

- Practical activity is encouraged (Hands- on discovery)
- Links with the environment are fostered
- Children have an opportunity to work together, share ideas and communicate their findings (insofar as this is practicable);
- Children’s ideas are the starting point for science activities (Concept mapping)
- Children should be allowed the excitement of finding out for themselves
- Children are encouraged to pose their own questions

The use of a variety of approaches and methods will facilitate the efficient implementation of the science curriculum. The nature of the strands and strand units themselves necessitates the use of a variety of teaching methods. The approaches chosen should enable the children to work scientifically in a variety of contexts, to undertake practical activities and to tackle open-ended investigations. Different methods are outlined as follows:

Whole-class work: This is effective in introducing a topic and concept mapping. It is also useful in providing background information that may be required for an activity.

Small groups:

This can be in many forms:

- Several groups working on the same activity
- Small groups rotating around different activities (circus of experiments)
- Small groups working on independent activities

Individual work: This is where children pursue their own studies and carry out investigations that allow them to pursue their own interests and ideas.

9. Using the Environment

The school is committed to making full use of its grounds and the habitats of the locality. The immediate environment will be the starting point for environmental education and as the pupils' knowledge and understanding grow they will learn about other environments in the Irish, European and global context. In keeping with the school's efforts to gain the Green Flag award.

- The school began a Green School's Committee in January 2011 and a litter and waste review was carried out. The children carried out a programme of actively participating in litter management, composting, recycling and waste reduction. The application for a school green flag was made in 2011/2012. The school received its green flag.

Habitats within the school grounds include:

- Grass.
- Trees.
- Hedgerows.
- Garden

Our science plan will reflect seasonal changes and children will work outdoors regularly to observe the effects of seasonal change.

Schemes are organised by whole school to foster Environmental Awareness and Care e.g. recycling, compost heap.

10. Linkage and Integration

The linkage of Strands with science (pg. 34 Teacher Guidelines), and the integration of Science with other subjects is encouraged in our school. Pupils' view of the world is a holistic one and as such more meaningful learning is achieved in an integrated setting. Examples of Integration, with other subjects, include: Growth and Change in Living Things described in Science links with this theme in SPHE Materials in Science links with Visual Arts Design and Make in Science links with Maths and Visual Arts Environmental Awareness and Care is closely linked with the SPHE and Geography Curricula Where there is an opportunity, maths should be linked with Science eg. Charting findings, balancing, weighing, measuring, counting, capacity, time, temperature, shape etc. can be used in some science experiments

11. Balance between knowledge and skills

Learning science will help children to develop the practical skills of investigation and of designing and making. The extents to which they can develop these skills depend on age, stage of intellectual development and the types of practical investigations they experience.

Examples of what these skills mean at the different class levels are:

(a) Questioning

Infants ask questions about animals plants objects and events in the immediate environment while Fifth and Sixth class will progress to ask questions which also identify problems to be solved, and will help in drawing conclusions and interpreting information.

12. Resources and Equipment

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 following equipment will be available in the school storage room:

- Timers
- Goggles
- Teeth set
- Electricity
- Rocks and minerals
- Rocks and soil
- Bug catchers
- Safety tops
- Balloons
- Torches
- I-Pads

▪ Textbooks

- Junior & Senior Infants: Explore With Me and a variety of worksheets compiled by class teacher
- 1st & 2nd Class use Explore With Me & worksheets compiled by class teacher
- 3rd & 4th Class use Small World 3rd & 4th and a variety of worksheets compiled by class teacher
- 5th & 6th Class use resources from Science Quest 5 + 6 (C.J. Fallon), Junior Certificate Science Revision (Mentor)

13. Broad and Balanced

A broad range of topics from each of the strands in the curriculum is included and work from each strand unit is included over the two year period.

14. Looking at children's work

Children are given opportunities to record their work in a variety of different ways using

- Teacher observation.
- Teacher – designed tasks and tests
- Concept mapping
- Work samples, port folios and projects
- Curriculum profiles

15. Children with Different Needs:

We will endeavour to make science activities accessible to all children, as we

- Recognise the potential science has to help them make sense of the physical and biological worlds in which we live.
- We are aware that science offers many opportunities for fun and to develop a sense of curiosity and wonder Hands on practical work to suit all abilities is used in science lessons
- Activities will be differentiated according to ability

- ICT/Digital images can be used to record work
- Recording will be based on the child's level of understanding eg. brainstorm, annotated drawings etc
- Assistance from school personnel will be availed of when appropriate

16. Safety

During practical work teachers should be aware of the safety implications of any exploratory or investigative work to be undertaken. Children should be encouraged to observe safety procedures during all tasks. There are many safety issues to consider including:

Plants and Animals

Disposable gloves are to be used when investigating hedgerows. Children should never handle unknown or unfamiliar plants, especially fungi. Gloves should be worn also when handling birds or animals. Hand washing should be encouraged after handling plants and animals.

Electricity

Children should only use low-voltage battery powered devices. (Max. 6v.) Mains electricity should never be used for electricity and magnetism experiments. If mains-powered equipment is used then it should be connected and operated by the teacher only. Children should be repeatedly warned about the danger of mains electricity.

Equipment

The use of glass apparatus and sharp-edged tools should be avoided except under the direct supervision of the class teacher. Use plastic where possible. Thermometers should be handled carefully.

Eyes

Children should never use lenses, binoculars or other lenses devices to look directly at the sun or other intense source of light. This includes dark glass and plastic.

Chemicals

Household chemicals should be purchased to meet the requirements of the experiment and any surplus disposed of on completion of experiment. Try to avoid any chemical containing bleach. These chemicals will not be stored in the science resource boxes.

Polythene Bags

Children should be warned of the dangers of using these bags as they may cause suffocation.

Heat

Under no circumstances should the children themselves handle matches or lighters. If using candles during an experiment please ensure that they are securely fastened. Lighted candles should never be moved. Care should be taken to avoid situations where children may be tempted to lean across a lighted candle. Long hair should be tied back and loose sleeves secured.

Any heating can be done with tepid water from a tap. Flammable liquids should never be used.

Cleanliness and Hygiene

Random sniffing and tasting should be discouraged. The teacher should explain that anything the children are asked to smell or taste has been carefully chosen for that activity. The sharing of spoons or other utensils should not be permitted. Hand washing should be encouraged before food activities.

15. Homework

Homework should be in line with the approaches as set out in the Primary School Curriculum for Science

16. Individual Teachers' Planning and Reporting

Teachers should base their yearly and short term plans on the approaches set out in this whole school plan for Science. Work covered will be outlined in the Cuntas Míósúil. Cuntas Míósúla will be used to review the school's programme for Science.

17. Staff Development

Teachers are made aware of any opportunities for further development through participation in courses available in Education Centres or other venues. Skills and expertise within the school are shared and developed through inputs at staff meetings

18. Parental/Community Involvement

Parents are encouraged to support the school's programme for Science. Parents with particular expertise may be invited to address classes. Parents are invited to accompany field trips. Visitors such as engineers or scientists visit the school.

Working safely in the outdoor environment

Outdoor work should be based in areas that are accessible for children, teachers and helpers and that are safe.

Preliminary visits by teachers can be used to identify potential hazards. If there are apparent dangers then a more suitable habitat should be selected for study. Habitat studies involve children in working with plants and animals, and teachers should be aware that many children are allergic to some animals and plants.

Adequate supervision should be given to the children at all times. As most outdoor investigations will involve children working in small groups, it will be necessary for a number of adults to accompany each class. These adults should be aware of the hazards that; may be encountered and the procedures to be adopted in the event of emergencies.

Safety

- Children should not look at the sun or at very bright beams of light, such as projector beams.
- Plastic mirrors should be used for investigation and children should avoid using glass mirrors.
- Pupils should never look at the sun through lenses.
- Children should be made aware of the dangers of sunburn.

Safety and care of equipment

- Batteries should be disposed of in a safe manner. There may be a battery recycling depot in the locality.
- Rechargeable batteries should not be used for investigations.
- Leads, composed of lengths of insulated wire, will be necessary for making circuits. The teacher or a specially designated adult can strip the plastic covering from the leads using wire cutters and strippers or a sharp scissors. Children should never undertake this task.

Success Criteria

The success of this plan will be measured using the following criteria:

- Continuity of content and methodology will be evident in teachers' preparation and monthly reports
- Ongoing assessment, formal and informal will show that pupils are acquiring an understanding of concepts and a proficiency in scientific skills appropriate to their age and ability

Implementation & Review

This Science Plan was reviewed by Eva O'Driscoll in collaboration with other teachers in April 2021. Teachers will review the plan every 3 years following this. The next review will take place in April 2024.

Ratification

The School Plan for Science was ratified by the Board of Management of Kilbonane National School on 28 April 2021.

Signed: _____
Chairperson B.O.M Denis Healy