**Title**

**Whole School Plan Science**

**Introductory Statement and Rationale**

**(a) Introductory Statement**

This policy was reviewed in 2022 by the whole teaching staff of St. Colman's National School, in accordance with the guidelines set out in the Primary School Curriculum 1999. Through the formulation of this policy, a common understanding of the purpose of the subject and how it will be implemented in this school has been created among the staff. Therefore, it will form the basis for teachers' long and short term planning. It will also inform new and temporary teachers of the approaches and methodologies used in the teaching of Science in our school

**(b) Rationale**

S E S E and Science in particular, is concerned with the development and understanding of the biological and physical aspects of the world. Science and technology can make a vital contribution to the holistic development and education of the child by providing opportunities for the development of:

(i) A broad and balanced understanding of the properties and interactions of the physical universe.

(ii) Scientific ways of investigating and exploring the world.

(iii) Positive attitudes to science and an appreciation of the contribution of Science and technology to society. (iv) We recognise that the curriculum is Spiral in nature and this shall be borne in mind when planning.

**Vision and Aims**

**(a) Vision**

Pupils will be enabled to:

(i) Develop an interest in and curiosity about world through the exploration and study of living and non-living things.

(ii) Develop and apply constructive thinking.

(iii) Observe, ask questions, hypothesise, plan, experiment, design, make, discuss, analyse and evaluate results.

(iv) Communicate and record observations, evidence and results of experiments

(v) Become actively involved in the discussion, exploration and resolution of environmental issues.

(vi) Understand and apply a safety code in scientific and technological investigations and activities.

(vii) Understand the interdependence of a wide variety of living things and their environments, recognise the importance of conserving habitats and environments and begin to understand that all life now and in the future depends on sustainable development.

(b) **Aims**

Aims The aims of science education are:

(i) To develop knowledge and understanding of scientific and technological concepts through the exploration of human, natural and physical aspects of the environment. (ii) To develop a scientific approach to problem-solving To encourage the child to explore, develop and apply scientific ideas and concepts .

(iii) To foster the child's natural curiosity.

(iv) To aid the child to appreciate the contribution of science and technology to the wider world.

(v) To appreciate and respect diverse living and non-living things.

(vi) To encourage the child to become environmentally responsible and aware.

(vii) To enable the child to communicate ideas, present ideas and report findings using a variety of media

**Approaches and 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. 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
- 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.

**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:

**i. Plants and Animals**

Teachers should be aware of the possible dangers when investigating plants or handling birds or animals. Handwashing should be encouraged after handling plants and animals. Teachers should warn pupils of any possible danger they may encounter on environment investigations

**ii. Electricity**

Children should only use low-voltage battery powered devices. Mains electricity should never be used by children 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.

**iii. Equipment**

The use of glass apparatus and sharp-edged tools should be avoided except under the supervision of the class teacher. Use plastic where possible. Thermometers should be handled carefully. If a thermometer breaks and mercury is spilt it should be carefully gathered up by the teacher and buried in a place where the ground will not be disturbed. Spirit thermometers should be used at all times.

**iv. Eyes**

Children should be warned of the dangers of using lenses, binoculars or other lenses devices to look directly at the sun or other intense source of light. This includes dark glass and plastic.

**v. Chemicals**

Chemicals should be labelled, sealed and safely stored. Try to avoid any chemical containing bleach. Use safety goggles where possible. Polythene Bags Children should be warned of the

dangers of using these bags as they may cause suffocation.

**vi. 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 hot water from a tap or from a kettle held by an adult. Flammable liquids should never be used. Small portable gas burners are relatively safe provided that they can be securely mounted to prevent them from toppling over. If they are used, they should be sited clear of curtains, notice boards and busy areas.

**vii. 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.

**Skills Development**

**Working Scientifically**

Working scientifically will involve children in:

- Observing
- Questioning
- 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

As children learn to apply these skills they will learn to deal with more complex concepts in a scientific way. (See Teacher Guidelines pp17-21)

**Assessment**

Assessment in Science is concerned with the children's mastery of knowledge and understanding of the strands of the science programme and the development of skills and attitudes. Consequently a broad range of assessment tools and approaches will be necessary. The following are among the assessment tools that teachers can use.

I. **Teacher Observation**

Observations made by the teacher during practical science tasks will help to determine the development of process skills and attitudes. They will also help to establish the extent to which the children have mastered the knowledge aspect. The teacher will need to take an active role in science tasks and ask open-ended questions to gain insight into a child's understanding.

**II. Teacher-designed tasks and tests**

Some representational record, whether written, drawn, sculpted or modelled, is necessary to build up a picture of the child's achievements. A wide variety of tasks should be provided for the children, including:

Observing
Analysing objects and processes and hypothesising about how systems work or are made
Predicting outcomes of an investigation
Collecting information from books and materials
Asking questions
Providing oral, written and pictorial accounts of investigations
Displaying projects
Using work cards or activity sheets
Designing, making and evaluating models and structures
Exploring and engaging in practical investigations in the environment
Completing teacher-designed tests on a unit(s)
Displaying and reporting project work
Drawing with labels (teacher can discuss drawing with child and annotate it as a result of asking questions)

The child's initial ideas must be explored if they are to form a starting point for learning. This will help enormously to see what preconceived ideas the children may have. It is also useful as an assessment tool at the end of a unit to see if there has been any progression.

**III. Work samples, portfolios and projects**

A wide range of samples of a child's work is compiled to form a science portfolio. This should document and assess progress over a school year. The samples chosen should demonstrate achievement in a range of areas. Samples of work in one area may be included to show progression of ideas and skills. A scrap book or folder may be used for there. Digital camera can be

used to record experiments etc.

Written accounts or drawings, photographs of stages of an investigation, graphs, samples of worksheets or audiotapes of children's reports of investigations may be enclosed.

**Equality of Participation and Access**

Science will be accessible to all children within the school regardless of their age, gender or ability. We will place an equal emphasis on the role of women in history, looking at the contribution of women from a local, national and international perspective. In our school we recognise the contribution of ordinary people to science and we will place emphasis on the roles of everyday people in science.

For those children experiencing any form of disadvantage we will adapt the teaching and learning to meet their needs. The work will suit their ability, and we will use alternative resources, ICT and visual aids where deemed necessary.

**Homework**

Homework will be at the discretion of the class teacher and in line with the school's homework policy. We recognise that some of our pupils may not have easy access to scientific materials in their homes and our prescription of homework will reflect this. Teachers are aware of the need to strike a balance between observing, discussing, investigating, recording and learning. We recognise that is not essential that all pupils be assigned for the same homework. Special consideration shall be given in some cases.

**Linkage and Integration**

It is our intention to link activities and concepts to other areas of the Science curriculum and to integrate science with other curriculum areas. It is also a policy of ours to utilise Science lessons as opportunities to develop children's language competence and confidence. This new vocabulary should allow the children to engage with and challenge other Scientific Challenges in their environment.

**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 Where it is meaningful and suitable Science will be taught in a thematic way to integrate with the other SESE subjects of History and Geography. Cúntais Míosúil will assist in recording work covered, in evaluating progress in Science and informing future teaching.

**Staff Development**

Teachers will be encouraged to attend in-service workshops and courses on Science in order to enhance their understanding and teaching of the subject. They will up skill other staff in what they

have learned by sharing the expertise acquired at these courses. The school will access the PDST Science Cuiditheoir through the Regional Curriculum Support Service to support the staff in certain strands if necessary. Guest speakers may be used to supplement and support the work of the class teacher. These are recognised as up-skilling opportunities for the teachers involved.

**Parental Involvement**

We encourage parental involvement in the formation of our school policies. Draft policies are provided to the Parent's Association so parents are given the opportunity to contribute. The Board of Management and the Parents Association are given draft copies of our policies and plans and bring them to the attention of the wider community. We encourage parental involvement particularly when a parent has a skill or interest they wish to share. We ask them to share their own personal memories of when they were young. We have invited and will continue to invite some parents and grandparents to talk to the children. Parents send in photographs and artefacts and help with other aspects of the history curriculum when they are asked to do so.

**Community Links**

Local organisations are invited to provide information on the services that they provide. We are very much aware of the school's role in the community and we are also conscious of the fact that the expertise of people in the community is an invaluable resource to any school. Where expertise is available in the area, these people will be invited into the school.

**Success Criteria**

In future we shall review this whole school plan under the following headings:

- How individual teacher preparation, planning and teaching reflects this plan?
- Are procedures outlined in this plan consistently followed?
- How methodologies listed in this whole school plan are working in the classroom?
- Science resources
- How successful are the scientific concepts learnt by the children?
- How well are the children's scientific investigations skills progressing?
- Evidence of practical activities in the classrooms
- Evidence of indoor and outdoor work

**Means of assessing the outcomes of the plan will include**

- Revisiting the aims of this plan as a staff
- Teacher/Parent feedback
- Children's feedback
- Inspectors reports/suggestions
- Results of class assessment

**Implementation**

**Roles and Responsibilities**

- Class teachers are responsible for following the whole school plan and for the implementation of the history programme in their own class.
- Pupils are expected to co-operate and participate in class lessons.
- Parent are responsible for supporting their children's learning
- The principal is responsible for leading the monitoring and evaluating of the plan

The following staff members will have responsibility for the following:
1. Scientific audit of school grounds and immediate locality: All staff
2. Fieldwork, trails and packs - All staff
3. Purchase, maintenance and storage of resources - Post Holder
4. Leading the development of the new methodologies identified - All staff
5. Liaising with community organizations and relevant agencies - Post Holder; Principal
6. The development of ICT as a learning tool in Science and the vetting of websites - Post Holder; Principal
7. Attendance at up skilling workshops and courses as well as providing feedback to staff; All staff

**Review**

**Roles and Responsibilities**

The following people will be involved in the review of the History plan:
- The Board of Management of Ballindaggin National School
- The principal
- The teachers
- The pupils
- The parents/guardians of Ballindaggin National School

**Timeframe**

Review will be carried out on a biannual basis

**Ratification and Communication**

The Board of Management ratified this policy on the _____ of _____ 20___

Signed: _____ , (Chairperson, BOM)

The policy is available to view on the school website or a hard copy can be requested via the school office.