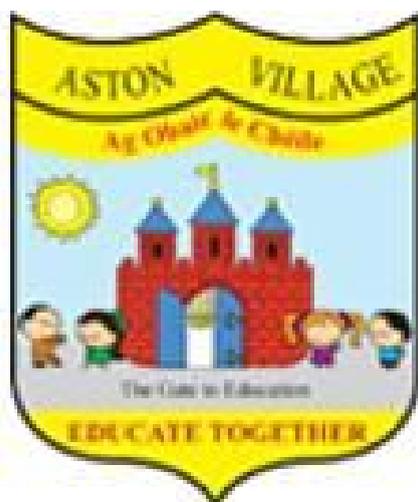


# Aston Village ETNS



## Whole School Plan Science

## **Science Policy**

### **Introduction:**

This policy was formulated in 2008 by the whole teaching staff of Aston Village E.T.N.S., in accordance with the guidelines set out in the Primary School Curriculum 1999. This policy was amended in 2016 following a consultative process which took place over a period of months. The Principal and teachers were involved in drafting this new policy. 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.

### **Rationale:**

#### **This policy has been drawn up:**

- To benefit the planning, teaching and learning of Science in our school.
- To conform to the principles outlined in the 1999 Science Curriculum.
- To provide a coherent approach to the teaching of Science across the whole school, promoting and fostering the development of important scientific skills, concepts and knowledge.
- To promote the distinctive role that science plays in enabling the child to explore and understand the natural, human, social and cultural environments in which he/she lives.

## Vision and Aims:

### **Our Vision**

At Aston Village E.T.N.S. we believe that children of all abilities and all backgrounds will benefit from the study of Science. 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 Science education are:

- 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 emphasises 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 and respect for the diversity of living and non-living things, their interdependence and interactions
- To enable the child to communicate ideas, present ideas and report findings using a variety of media

### **We also aim to:**

- Continue our participation in the Green School Programme
- Take part in local & national science initiatives.
- Integrate other specially designated days and weeks into our school calendar e.g. national tree week, energy awareness week, water conservation week etc.
- Purchase additional science equipment as necessary.

### **Approaches and methodologies**

It is essential to use a range of teaching methods and approaches when teaching Science.

Our main aim is to get the children “thinking scientifically.” The approaches adopted should create a learning environment where:

- Practical, hands-on discovery and activities are encouraged
- 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/KWL/brainstorming)

- Children should actively engage in as many experiments as possible
- Children are encouraged to pose and answer their own questions, through active investigation.

The use of a variety of approaches and methodologies 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.

**Content of Plan:****Curriculum:****1. Science Programme: Junior – Second Classes**

<i>Skills development</i>	
<b>Working scientifically</b>	<ul style="list-style-type: none"> <li>• Questioning</li> <li>• Observing</li> <li>• Predicting</li> <li>• Investigating and experimenting</li> <li>• Estimating and measuring</li> <li>• Analysing</li>   <li>• Recording and communicating</li> </ul>
<b>Designing and making</b>	<ul style="list-style-type: none"> <li>• Exploring</li> <li>• Planning</li> <li>• Making</li>   <li>• Evaluating</li> </ul>
<i>The science skills above will be developed as work is completed on the strands and strand units of the curriculum outlined below.</i>	
<i>Strands</i>	<i>Strand units</i>
<b>Living things</b>	<ul style="list-style-type: none"> <li>• Myself</li>   <li>• Plants and animals</li> </ul>
<b>Energy and forces</b>	<ul style="list-style-type: none"> <li>• Light</li> <li>• Sound</li> <li>• Heat</li> <li>• Magnetism and electricity</li>   <li>• Forces</li> </ul>
<b>Materials</b>	<ul style="list-style-type: none"> <li>• Properties and characteristics of materials</li>   <li>• Materials and change</li> </ul>
<b>Environmental awareness and care</b>	<ul style="list-style-type: none"> <li>• Caring for my locality</li> </ul>

## Third – Sixth Classes

<i>Skills development</i>	
<b>Working scientifically</b>	<ul style="list-style-type: none"> <li>• Questioning</li> <li>• Observing</li> <li>• Predicting</li> <li>• Investigating and experimenting</li> <li>• Estimating and measuring</li> <li>• Analysing</li> <li>• <i>Sorting and classifying</i></li> <li>• <i>Recognising patterns</i></li> <li>• <i>Interpreting</i></li> </ul> <ul style="list-style-type: none"> <li>• Recording and communicating</li> </ul>
<b>Designing and making</b>	<ul style="list-style-type: none"> <li>• Exploring</li> <li>• Planning</li> <li>• Making</li> </ul> <ul style="list-style-type: none"> <li>• Evaluating</li> </ul>
<i>The science skills above will be developed as work is completed on the strands and strand units of the curriculum outlined below.</i>	
<i>Strands</i>	<i>Strand units</i>
<b>Living things</b>	<ul style="list-style-type: none"> <li>• Human life</li> <li>• Plants and animals</li> </ul>
<b>Energy and forces</b>	<ul style="list-style-type: none"> <li>• Light</li> <li>• Sound</li> <li>• Heat</li> <li>• Magnetism and electricity</li> <li>• Forces</li> </ul>
<b>Materials</b>	<ul style="list-style-type: none"> <li>• Properties and characteristics of materials</li> <li>• Materials and change</li> </ul>
<b>Environmental awareness and care</b>	<ul style="list-style-type: none"> <li>• Environmental awareness and care</li> <li>• Science and the environment</li> <li>• Caring for the environment</li> </ul>

## Children's Ideas

Children's ideas may be the starting point for scientific activities. The children will be given opportunities to test these ideas through practical investigations.

## Classroom Management

The use of a variety of approaches and methods will facilitate the efficient implementation of the science curriculum. A combination of approaches will be used to meet the needs of pupils and the nature of the topic

- Talk and discussion (collaborative/co-operative learning)
- Using the environment
- Open and closed questioning
- Annotated drawings
- Concept maps
- Concept cartoons
- Brainstorming
- Free play with materials

Whole class, small group work, pair work and/or individual work will be undertaken during different investigations. The appropriate scientific language to be used during an investigation will be identified by the class teacher and taught in context accordingly.

## Practical Investigations:

Science investigations provide children with the opportunity to use and apply concepts while solving problems.

A combination of open-ended investigations

- *Pupils are given or may suggest an open question for which they have to design their own investigation*

and closed investigations will be used.

- *Pupils will engage in activities where the end result is obvious and there are not many variables.*

To encourage children to suggest their own investigations, opportunities will be provided for the free exploration of materials. Practical investigations will require the children to have an understanding of the concept of a 'fair test'. Through the promotion of 'Fair testing' pupils will develop the scientific skill of determining experimental items as those that are constant and those that will be variable and thereby measurable and comparable.

***Pupils will be encouraged to ask:***

- *What is being tested?*
- *What are we trying to discover/investigate?*
- *What may change and act as a variable?*
- *What will be kept the same or constant?*
- *What will be measured or compared?*

**Linkage and integration**

The opportunity for an integrated approach exists in all levels in the science curriculum within the school. The strands and strand units of the science curriculum are not discrete and therefore a topic , work or

investigation that is being undertaken may incorporate strands from other curriculum areas. Teachers will make provision for this linkage and integration in their short-term planning.

### Assessment of the science curriculum

Children's progress in science is assessed through:

- Teacher observation
- Teacher designed tasks and tests
- Pupil work samples, projects, portfolios, concept maps and annotated drawings
- Self-assessment
- Conferencing
- Questioning

### Organisational planning

#### Timetable

Our Science plan, in keeping with the recommendations in the Primary School Curriculum Introduction (*pg. 70*), devotes a minimum of two and quarter hours per week (Infant classes) to SESE. A minimum of three hours per week for classes from 1<sup>st</sup> to 6<sup>th</sup>. One hour of this time will be spent on Science and on occasion time for Science may be blocked, as appropriate, when classes are working on an integrated project or undertaking investigative/exploratory work in the local environment. Teachers will use discretionary curriculum time (2 hours per week) for SESE as appropriate.

Our Science plan is based on the curriculum's recommended spiral approach and for this reason it is not intended that all strand units be taught in each class, each year. Rather that the strand units be covered

over a two year period. The strand units may be supplemented by extension work at the discretion of the class teacher.

## 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.g. 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. Children will be encouraged to observe safety procedures during **all** tasks.

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)*.

Some of the many safety issues to consider include:

### Plants and animals

- Disposable gloves are to be used when investigating hedge grows. Children should never handle unknown or unfamiliar plants, especially fungi. Gloves are to 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. 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. 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 where possible.

### Cleanliness and hygiene

- Hand washing should be encouraged before food activities.
- ☆ 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)*.

### Resources and Equipment

- We have attached a list of our current resources for science to this plan. (presently being undertaken)
- Equipment and resource materials have been allocated to an appropriate box for each strand. A list of the contents of the box is attached to the lid. (presently being undertaken)
- The equipment will be checked and updated at the end of each year.
- Any equipment purchases will be organised by the science co-ordinator, in conjunction with the Principal and in consultation with the staff needs and requirements.
- Science boxes are presently stored in Alicia Ticehurst's classroom. Boxes must be returned to storage area after use. Science

coordinator should be alerted if there is a need to replenish consumables.

- The school encourages the use of science websites providing this is within the safe use of the internet guidelines. A list of helpful scientific websites are attached to this plan.
- Textbooks will be used as a resource.
- Environmentalists in the community will be invited to talk to the children and share their knowledge with them.

### 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 Science will be taught in a thematic way to integrate with the other SESE subjects of History and Geography. Cúntas Míosúil will assist in recording work covered, in evaluating progress in Science and in informing future teaching.

### 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.
- (\_\_\_\_\_) will be responsible for keeping resource material up to date and will arrange for opportunities for resources to be assessed for purchase and for new approaches to be piloted in the school.
- Teachers will be encouraged to attend in-service workshops and courses on Science in order to enhance their understanding and teaching of the subject. It is recommended that the newly acquired

expertise gained during courses should be shared during subsequent staff meetings.

- The culture in our school is one that encourages the sharing of experience and good practice.

## Parental Involvement

Parents are encouraged to come to the school to help out in the delivery of the Science programme by helping out in supervision of fieldwork when/if needed or by taking part in whole school science activities.

Parents are invited to celebrate and view results of projects, surveys, investigations in the school or read about them in the school newsletter (**School Science Fair – October/November**)

Parents will be advised to study the Primary School Curriculum; *Your child's learning, Guidelines for Parents (NCCA)*; *The What, Why and How of children's learning in primary school, NCCA DVD (2006)*.

## 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 local 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 for schools, we will welcome visits by speakers from these organisations e.g. *SEI, ENFO*.
- National Tree Week (October)
- National Science Week—Science Fair where all pupils will demonstrate experiments that they have undertaken.
- Parental participation—parents with specific scientific knowledge will be invited to the school to share their expertise with pupils (e.g. farmers; scientists; engineers etc.).
- Heritage in the School Scheme—speakers and workshops to give pupils an opportunity to hear people speak with passion about their area of interest (e.g. geologists; scientists etc.).

- The Green Schools Initiative—we are working towards our 3rd Green Flag—water conservation.

## Success Criteria

We shall review this whole school plan in the future under the following headings:

- Are procedures outlined in this plan consistently followed i.e. procedures for fieldwork, assessment.
- Are the methodologies listed in this whole school plan working in the classroom
- Are the Science resources available at the school satisfactory and updated regularly
- Are Scientific concepts being learnt by the children e.g. fair testing
- Are the childrens' scientific investigation skills progressing and being enhanced from class to class
- Evidence of practical activities in classrooms
- Evidence of indoor and outdoor work
- The student's progress from year to year will reflect work done in previous classes. The success of the programme will also be evident in pupil's participation and positive feedback.

Means of assessing the outcomes of the plan will include:

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

## Implementation

## Roles and Responsibilities

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

The following staff members will have responsibility for:

- Fieldwork trails and packs. – Class teacher
- Purchase, maintenance and storage of resources. -----
- Liaising with community organisations and relevant agencies -Class teacher
- The development of ICT as a learning tool in Science and the vetting of websites. – class teacher/**Paul Carolan**
- Attendance at up-skilling workshops and courses, providing feedback to staff – class teacher

## Review

It will be necessary to review this plan on a regular basis to ensure optimum implementation of the Science curriculum. We aim to further review this plan in **March 2017**. The Principal and staff will be involved in this review.

## Ratification and Communication

This plan was ratified by the Board of Management in \_\_\_\_\_

Chairperson: \_\_\_\_\_

Due for review: **March 2017**

