



Mount Anville Montessori Junior School



Science Plan

School Year 2015/2016

Introductory Statement and Rationale

Introductory Statement

We aim through this plan, drawn up by MAMJS teachers to set out our approaches to the teaching and learning of Science. 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 our school. The plan was drafted in the School Year 2015/2016 after a process of consultation within the staff.

Rationale

We focussed on this area of planning to ensure that the revised guidelines for science were introduced 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 MAMJS Science Curriculum.

Vision and Aims

Vision

Through our school' 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 consiously develop children's scientific skills as well as their sceintific knowledge.

Environmental activities will foster a positive attitude and a sense of resposibility among our pupils for the natural and human environments.

The aims of social, environmental and scientific education

- Enable the child to acquire knowledge, skills and attitudes so as to develop an informed and critical understanding of social, environmental and scientific issues
- Reinforce and stimulate curiosity and imagination about local and wider environments
- 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
- Foster an understanding of, and concern for, the total interdependence of all humans, all living things and the Earth on which they live
- 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
- Cultivate humane and responsible attitudes and an appreciation of the world in accordance with beliefs and values.
- Continue participation in the Green School Programme and apply for flag in Biodiversity

- Develop the MAMJS Wildflower Garden
- Create the MAMJS Environmental Trail based on the trees/flowers/buildings in the school grounds
- Take part in science activities e.g. MAMJS 5th Class Science Exhibition
- Integrate other specially designated days and weeks into our school calendar e.g. national tree week, The Green Committee parents bringing all classes on Environmental Trail during Active Week.
- Purchase additional science equipment if requested and needed by staff

Curriculum Planning

Strands and Strand Units:

Children's Ideas

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

Strategies we will use to elicit children's ideas are:

- Talk and discussion
- Open and closed questioning
- Annotated drawings
- Concept maps
- Concept cartoons
- Brainstorming
- Free play with materials

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 investigation
- 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.

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.
- Classes are encouraged to display projects on noticeboard or on exhibition displays outside their classrooms
- We encourage both the investigative approach and the teacher-directed approach
- Teachers will use their professional judgement to decide which methods and approaches are best suited to the needs of their pupils.

Key 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

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

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.

Using the Environment

We have completed an environmental audit of the school grounds as part of our Green Flag with age appropriate activities and a variety of skills to development through a progressive approach

Each class will engage in a variety of activities to support the Green Flag achievement and then its maintenance: Energy, Water, Recycling and Biodiversity (February 2016)

Insert Green Grid

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.

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

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. Information from assessment will be communicated to parents in the school report at the end of the year and at the parent/teacher meetings.

Children with Different 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 more-abled pupil will be encouraged to undertake additional research and recording their scientific findings in a variety of ways.
- Support for particular children or groups as directed by class teacher

Equality of Participation and Access

- 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 at the Montessori levels
- Provision will be made for children experiencing any form of special needs or whose first language is not English
- Science will be for all children regardless of gender, age or ability

Organisational Planning

Timetable

On average, two and quarter hours per week is devoted to SESE in half-day classes and a minimum of three hours per week for full-day classes.

On occasion, time will be blocked as appropriate. This might occur when working on a integrated project or exploring the MAMJS environment

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

Resources and Equipment

- We have a Science room located near the Bursar's Office with a large resource base divided into the Sciece areas of investigation
- Equipment and resource materials have been allocated to an appropriate box in the Science room and a list of the contents of the box is attached to the lid.
- Science apps are available the MAMJS school i-pads and up-dated by the school ICT co-ordinator.
- The school encourages the use of science websites providing this is within the safe use of the internet guidelines.
- We will use textbooks as a resource
- We will make use of the following packs to enhance our teaching of Science
- Environmentalists and links with DLR personnel will be asked to talk to the children and share their knowledge with them.

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

Teachers will consult with the Principal/Deputy 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.

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.

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.
- Each teacher will be responsible for keeping resource material in good condition and replaced in the appropriate Science box after use.
- 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.

Parental Involvement

- Parents are encouraged to come to the school to help out in the delivery of this programme by helping out in supervision of fieldwork when/if needed or 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.

- Parents are invited to become members of the Green Committee on an annual basis.
- People in the local community who have an interest and knowledge in the environment will be invited to speak to the children.
- MAMJ 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- project to ensure that all Irish native trees are located on the grounds of MAMJS
 - Green Schools
 - North Bull Island
 - Bird Watch Ireland

Success Criteria

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

- How individual teacher preparation, planning and teaching reflects this plan.
- Science Resources
- How well are Scientific concepts learnt by the children
- Evidence of practical activities in 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

Review

It will be necessary to review this plan on a regular basis or as the need arises