1. Broad objectives

The science curriculum should enable the child to

- develop an interest in and curiosity about the world through the exploration and study of living and non-living things
- develop a knowledge and understanding of scientific ideas through the study of living things and the environments in which they live, energy and forces, materials and processes of change
- observe, ask questions, discern patterns, hypothesise, plan, experiment, design, make, measure, discuss, analyse and evaluate results and so develop a scientific approach to problem-solving
- develop and apply constructive thinking in scientific investigations
- understand the application of some basic scientific ideas and concepts in everyday situations
- apply and use scientific knowledge, skills and resources in designing and making tasks
- explore and appreciate the influence that scientific and technological developments have on societies, life-styles, economic activities and the environment
- communicate and record observations, evidence and results of experiments and investigations using a variety of oral, written and graphical forms and other media
- explore the environmental repercussions of human actions on physical, natural and human environments
- 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 the sustainable development of the planet
- become actively involved in the discussion, exploration and resolution of environmental issues
- understand and apply a safety code in scientific and technological investigations and activities.

The teaching of Science at St Fiacc's will be in line with the principles and competencies of **The Primary Curriculum Framework.**

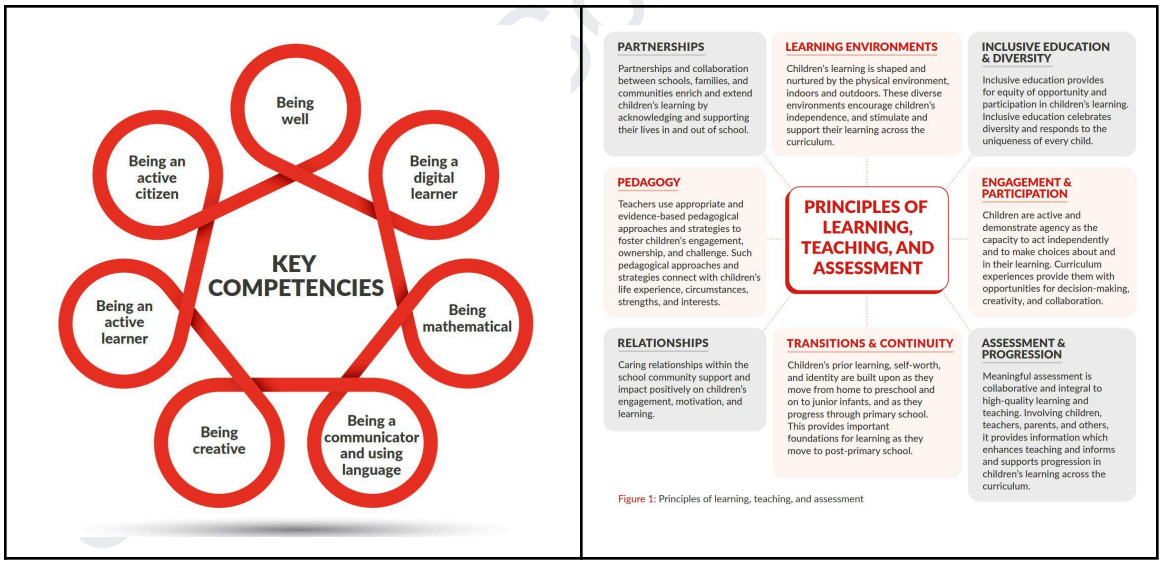


Figure 1: Principles of learning, teaching, and assessment

2. Vision

That the teaching of Science at St. Fiacc's will make a unique and vital contribution to the holistic development and education of the child. That the science curriculum will provide opportunities for the child to develop a broad and balanced understanding of the properties and interactions of the physical universe through the study of a range of topics, while at the same time developing and using scientific ways of investigating and exploring the world

3. 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 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.

4. Content

The content of the science curriculum has been divided into four levels: infant classes, first and second classes, third and fourth classes, and fifth and sixth classes. At each level the content has been divided into two distinct sections:

- content strands, which outline the subject matter that may be included in the science programme: **Living things; Energy and forces; Materials; Environmental awareness and care**
- a skills section, which covers: **Working scientifically** & **Designing and making**. Each strand includes several topics called strand units that will form the basic sections of the content to be covered.

It is through the study of these areas of content that the scientific and technological skills described in *Working scientifically* and *Designing and making* will be developed

StrandsAndStrandUnits
CurriculumGlanceCards

Each year children should experience topics from each strand unit. It is intended that over a two-year period all strand units from each strand should be covered.

Science Year 1
Science Year 2
Electricity tabulated
Magnetism tabulated
Light tabulated

5. Skills Development

Working Scientifically

Working scientifically will involve children in:

- Observing
- Questioning
- Predicting
- Hypothesising
- Investigating and experimenting
- Interpreting results
- Recording and communicating results

WorkingScientificallySkillsGlanceCards.pdf

Designing and Making.

Designing and Making is the technical component of the Science Curriculum where children apply their scientific knowledge to practical problem solving situations. Children of all class levels will engage in age appropriate designing and making activities which will be linked to the scientific concept being taught at the time. Ideally a unit of work in designing and making should follow the skills process outlined below

- Exploring
- Planning
- Making
- Evaluating

DesignAndMakeSuggestionsbyStrandUnits.pdf
DesigningAndMakingProcessesExplained

6. Linkage & Integration through STEM

The meaning of STEM for can be summarised as follows:

- STEM are integrated lessons involving at least two aspects of Science, Engineering, Technology and Maths.
- Instead of pupils working individually they work in teams.
- It is a problem solving approach and an inquiry based learning approach where the focus is on multiple solutions rather than the "right" answer.
- A true STEM lesson has an engineering design process (EDP) at its heart. This is where the team: *define the problem*, *propose a solution*, *outline a plan in simple steps*, *create a prototype*, and then set out to *improve the prototype*.
- STEM is grounded in Scientific inquiry which involves identifying a problem/issue/, formulating a question and mapping out a series of steps or investigation with a view to establishing a hypothesis or solution. The repeated trial and error process of the scientific method is driven by creativity. Giving pupils

a sense of agency over the task will spark invention as they set about reaching a conclusion.

STEM Sample Lesson Plan Template

Science *Strand* *Strand Unit*	Child will be enabled to
Technology	
Engineering	
Maths *Strand* *Strand Unit* *Element(s)*	

STEM & Coding
At St. Fiacc's we endeavour to embed computational thinking through STEM activities most notably through Technology. Computational thinking is at the heart of computer coding, where you create the code to instruct the computer to carry out a particular task. This requires clear and systematic thinking and the ability to problem solve and debug a set of instructions that are not working. Our STEM coding programme is as follows:

- introduce coding at Junior & Senior Infant class level through Bee Bots & VEX 123
- progress coding at 1st & 2nd class level using Blue Bots & VEX 123 & VEX GO
- consolidate computational thinking with Probots & VEX GO 3rd & 4th
- teach coding in 5th & 6th classes using Lego Spike and code.org
- Run a Maths enrichment robotics programme where high achievers in Maths are introduced to VEX Robotics

STEM Grant Project Plan 2024
Digital Learning Framework

7. **Methodologies, Approaches and Resources**

The methods and approaches adopted should create a learning environment where:

- children's ideas are the starting point for science activities
- practical activity is encouraged
- links with the environment are fostered
- children can apply scientific concepts to everyday situations
- children have an opportunity to work together, share ideas and communicate their findings.

Different **methods** of organising the science lesson are as follows:

- whole class work
- small groups
- individual work on chosen topics or projects

The use of a variety of **approaches** will facilitate the efficient implementation of the science curriculum including: (p. 54 TG)

- Investigative approach
- Closed activities
- Open investigations
- Teacher directed approach

Textbooks and work cards can be used during science lessons to support active investigative work. However, "Science lessons **should not be work card or text book based**" *cf* Curriculum Guidelines. Rather teachers should select activities from a variety of textbooks and workcards that will assist children in undertaking open-ended tasks.

To this end, it has been decided to create an inventory of **resources** for each class level to support the teaching of each strand. These resources are stored in designated classrooms.
The schedule of Science resources is outlined in the Science inventory Science Inventory

The 'Let's Talk' framework will help support and develop pupil's thinking by promoting **talk and discussion** about their ideas and strategies. Teachers can move from segment to segment through the 'Let's Talk' central hub, to scaffold discussion and extend thinking. Each segment can be revisited several times.
https://www.pdst.ie/primary/stem/lets-talk/science

8. Use of the school environment

We incorporate our local environment in the implementation of the science curriculum. Particular emphasis is placed on the natural environment, such as 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.

We are an active participant in the Green Schools project and 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.

Audit of Use of School Environment

9. Timetabling

The monthly time allocation for Science Technology and Engineering Education is 3 hrs 20 minutes in the infant classes, 4 hours for 1st - 2nd and 5 hours for 3rd-6th.

10. Assessment

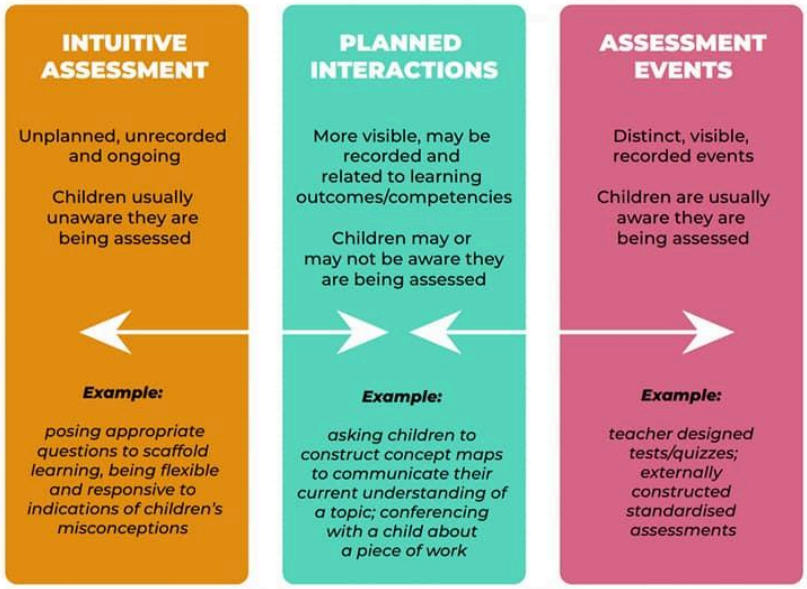
Assessment is an integral part of learning and teaching. It involves teachers and children

working together to use information to inform and support learning and teaching. These decisions are informed and shaped by:
• **knowledge of the child** and their prior learning (relationship with child, parent, previous teacher; Reports/Support files; observations)
• **knowledge of the curriculum** **www.sfi.ie** www.oide.ie www.curriculumonline.ie https://www.sfi.ie/engagement/curious-minds/ CPD; supports Teacher Planning Guide Science
• **knowledge of pedagogy**. (appropriate & engaging learning experiences; reflective practice; taking account of children's interests and prior learning)

Children as Scientific learners:
Providing children with regular time to talk about their learning, reflect and determine their next steps contributes to their identity and confidence as scientific learners.

Opportunities for assessing scientific learning:
Children's scientific learning can be assessed along a continuum from 'intuitive' to 'planned interactions' to 'assessment events' as shown in Figure 10. The three types of assessment are complementary, and necessary, to gain a comprehensive picture of a child's progress and achievement.

Figure 4: Continuum of assessment



*Portfolios: Portfolios can be assembled, digitally or otherwise, to compile evidence of children's scientific learning and provide a source of self-reflection, feedback and assessment. Artefacts could include pictures, recordings and work samples, among others. All pupils keep digital portfolios at St Fiacc's NS.

https://pdst.ie/sites/default/files/STEMLearningExperiencesReflectiveChecklist.pdf