Scoil Íde Whole SchoolPolicy for SESE - Science

Revised February 2022

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Introductory Statement and Rationale

(a) Introductory Statement

This document is a statement of the aims and objectives, principles and strategies for the teaching and learning of science in Scoil Íde Primary school. It was drafted in the school year 2004-2005 and has been reviewed through the process of consultation, discussion, and Haddington road hours and was revised in March 2014, November 2018 and Feb 2022

(b) Rationale

In drawing up this policy we considered how science would be taught in our school; how the subject will be developed through the school; and how we will provide for the teaching of science as outlined in the Primary School Curriculum. We recognise that an experimental and investigatory approach to science in the primary school can make a unique and vital contribution to the holistic development and education of the child.

Vision and Aims

(a) Vision:

Science gives children the opportunity to enhance their knowledge of themselves and the world around them in an interesting and exciting way. In our school children will engage in collaborative learning, experience working scientifically, develop a broad range of enquiry skills, cultivate important attitudes and acquire scientific knowledge and concepts about the biological and physical aspects of the world.

(b) 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 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

Objectives

We in Scoil Íde endorse the broader objectives of the Science Curriculum as articulated in the revised Primary School Curriculum 1999. When due account is taken of intrinsic ability and varying circumstances, the Science curriculum will enable the child: -

- to develop an interest in and curiosity about the world through the exploration and study of living and non-living things
- to 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
- to 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
- to develop and apply constructive thinking in scientific investigations
- to understand the application of some basic scientific ideas and concepts in everyday situations
- to apply and use scientific knowledge, skills and resources in designing and making tasks
- to explore and appreciate the influence that scientific and technological developments have on societies, life-styles, economic activities and the environment
- to communicate and record observations, evidence and results of experiments and investigations
- using a variety of oral, written and graphical forms and other media
- to explore the environmental repercussions of human actions on physical, natural and human environments
- to 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
- to become actively involved in the discussion, exploration and resolution of environmental issues
- to understand and apply a safety code in scientific and technological investigations and activities

▪ Content of Plan

1. Strands and Strand Units

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

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

Teachers will refer to the Science Curriculum in order to obtain practical examples and guidelines on how each of the Strand Unit objectives can be implemented (these practical examples are outlined under the objectives for each Strand Unit in italics).

Junior and Senior Infants

1. Strand: Living things

Strand Unit: Myself

The child should be enabled to

Variety and characteristics of humans

- identify parts of the male and female body
- recognise and measure physical similarities and differences between people

Human life processes

- become aware of some changes that occur as children grow and mature height, foot size
- become aware that people have a variety of needs for growth (exercise, food, clothing, shelter)
- develop an awareness of human birth
- use all the senses (touch, smell, sight, taste, hearing) to become aware of and explore environments.

Strand Unit: Plants and animals

The child should be enabled to

Variety and characteristics of living things

observe, discuss and identify a variety of plants and animals in different habitats in the immediate environment e.g. com mon trees and other plants, common birds and other animals in habitats such as ponds, trees, hedges, grass, rocks, soil

- become aware of animals and plants of other environments
- sort and group living things into sets e.g. flowers, leaves, trees, birds, food
- recognise and identify the external parts of living things e.g. flower, leaf, stem, root / tail, leg, beak, feathers

Processes of life

- observe growth and change in some living things
- explore conditions for growth of bulbs and seeds e.g. in soil, damp moss, wet paper
- become aware that animals and plants undergo seasonal change in appearance or behaviour colour change, leaf fall, appearance of buds and shoots, hibernation.

Integration

SPHE: Myself / History: Local studies

2. Strand: Energy and forces

Strand Unit: Light

The child should be enabled to

- identify and name different colours
- sort objects into sets according to colour
- observe colours in the local environment e.g. at school, in the home, in the street, in animal and plant life
- explore dark and bright colours and become aware of different shades of colour. Colour tables, coloured light
- discuss differences between day and night, light and shade ▪ explore how shadows are formed.

Strand Unit: Sound

- The child should be enabled to
- Recognise and identify a variety of sounds in the environment
- identify and differentiate between high and low sounds, loud and soft sounds
- explore ways of making different sounds using a variety of materials e.g. tins metals bottles and paper

Integration Music: Exploring sounds

Strand Unit: Heat

The child should be enabled to

- recognise the difference between hot and cold in terms of weather, food, water and the body
- identify ways of keeping objects and substances warm and cold

Linkage

Materials & Materials and change

Integration

Geography: Natural Environments-Weather

Strand Unit: Magnetism and electricity

The child should be enabled to

- use magnets of different shapes and sizes in purposeful play to explore their effects on different materials
- investigate the fact that magnets attract certain materials
- become aware of the uses of electricity in school and at home

- identify some household appliances that use electricity
- become aware of the dangers of electricity.

Strand Unit: Forces

The child should be enabled to

- explore, through informal activity with toys, forces such as pushing and pulling
- explore how the shape of objects can be changed by squashing, pulling and other forces
- investigate how forces act on objects through experimenting with different materials / group objects that will float or sink / push objects into water.

3. Strand: Materials

Strand Unit: Properties and characteristics of materials

The child should be enabled to

- observe and investigate a range of familiar materials in the immediate environment e.g. water, wood, textiles, food, plastic, metal, and rock
- describe and compare materials, noting the differences in the colour, shape and texture
- know about some everyday uses of common materials
- group materials according to certain criteria e.g. strength, colour, texture, flexibility
- investigate materials for different properties, for example materials that are attracted by magnets / materials that keep us warm / materials that absorb water and those that are waterproof.

Strand Unit: Materials and change

The child should be enabled to

- explore the effects of water on a variety of materials
- observe and describe materials when they are wet and when they are dry e.g. soil and paper
- identify some materials that are waterproof design and make a waterproof outfit
- explore the effects of heating and cooling on everyday objects, materials and substances e.g. ice - cream, butter, chocolate, water.

Integration

Geography: Natural environments; Human environments

4. Strand: Environmental awareness and care

Strand Unit: Caring for my locality

The child should be enabled to

- observe, discuss and appreciate the attributes of the local environment
- appreciate that people share the environment with plant and animal life
- develop a sense of responsibility for taking care of and improving the environment
- identify, discuss and implement simple strategies for improving and caring for the environment

- Linkage

Many of the objectives of this strand will be achieved as children complete work in other strands of the science curricula.

Integration

Environmental awareness and care is a cross-curricular strand common to the science and geography curricula.

SPHE: Myself and the wider world & Environmental care

First and Second Class

1. Strand: Living things

Strand Unit: Myself: The child should be enabled to

- Identify the variety and characteristics of living things
- name and identify external parts of the male and female body and their associated functions or senses
- become aware of the role of each sense in detecting information about the environment and in protecting the body
- recognise and/or measure physical similarities and differences between individuals

Human life processes

- recognise that all living things grow and change
- recognise that physical growth has taken place since birth
- identify some requirements for growth and development in the human food, sleep, exercise
- begin to identify the main phases of the human life cycle
- use all the senses to become aware of and explore environments.

Integration

SPHE: Myself

History: Local studies

Strand Unit: Plants and animals: The child should be enabled to

- Variety and characteristics of living things
- observe, identify and explore a variety of living things in local habitats and environments
- develop some awareness of plants and animals from wider environments recognise and describe the parts of some living things e
- recognise that trees are plants
- group and sort living things into sets according to certain characteristics e.g. hibernation / migration / farm animals / animals and plants that provide food

Integration Geography: Natural environments

Processes of life

- appreciate that living things have essential needs for growth
- explore, through the growing of seeds, the need of plants for water and heat
- investigate how plants respond to light
- understand that seasonal changes occur in living things and examine the changes in plant and animal life during the different seasons
- become familiar with the life cycles of common plants and animals.

2. Strand: Energy and forces

Strand Unit: Light: The child should be enabled to

- recognise that light comes from different sources
- recognise that light is needed in order to see
- investigate the relationship between light and materials
- recognise that the sun gives us heat and light, without which we could not survive
- become aware of the dangers of looking directly at the sun.

Strand Unit: Sound: The child should be enabled to

- recognise and identify a variety of sounds in the environment
- identify and differentiate between high and low sounds, loud and soft sounds
- explore ways of making different sounds using a variety of materials
- design and make a range of simple percussion instruments

Integration

Music: Exploring sounds

Strand Unit: Heat: The child should be enabled to

- become aware of different sources of heat energy
- learn that temperature is a measurement of how hot something is
- measure and compare temperatures in different places in the classroom, school and environment.

Strand Unit: Magnetism and electricity: The child should be enabled to

- use magnets of different shapes and sizes in purposeful play to explore their effects on different materials
- investigate that magnets attract magnetic materials, such as iron and steel
- investigate that magnets attract certain materials through other materials

- explore the effects of static electricity
- become aware of the uses of electricity in school and at home
- identify some household appliances that use electricity
- become aware of the dangers of electricity.

Strand Unit: Forces: The child should be enabled to

- explore how objects may be moved by pushing and pulling
- become aware of and explore how moving water and moving air can make things
- observe and investigate the movement of objects such as toys on various materials and surfaces
- investigate how forces act on objects

3. Strand: Materials

Strand Unit: Properties and characteristics of materials

The child should be enabled to

- a range of common materials used in the immediate environment
- describe and compare materials, noting the differences in colour, shape and texture
- begin to distinguish between natural and manufactured materials
- group materials according to their properties
- identify and investigate materials that absorb water and those that are waterproof
- begin to explore how different materials may be used in the construction of homes suited to their environments

Strand Unit: Materials and change: The child should be enabled to Heating and cooling

- explore the effects of heating and cooling on a range of liquids and solids
- become aware of and investigate the suitability of different kinds of clothes for variations in temperature
- explore ways in which liquids and solids may be kept hot or cold

Integration

Geography: Natural environments & Weather

Mixing and other changes

- begin to investigate how materials may be changed by mixing
- investigate the characteristics of different materials when wet and dry.

Linkage

The strands Living things and Energy and forces will complement this unit. Integration

Geography: Human environments

Strand: Environmental awareness and care

Strand Unit: Caring for my locality: The child should be enabled to

- identify, discuss and appreciate the natural and human features of the local environment
- observe and develop an awareness of living things in a range of habitats in local and wider environments
- observe similarities and differences among plants and animals in different local habitats
- develop an awareness that air, water, soil, living and non-living things are essential to the environment
- begin to recognise that people, animals and plants depend on one another
- realise that there is both an individual and a community responsibility for taking care of the environment
- identify, discuss and implement simple strategies for improving and caring for the environment
- identify and help to implement simple strategies for protecting, conserving and enhancing the environment
- become aware of ways in which the environment can be polluted or harmed

Linkage

Many of the objectives of this strand will be achieved as children complete work in other strands of the science curriculum.

Integration

Environmental awareness and care are a cross - curricular strand common to the Science and Geography Curricula. SPHE: Myself and the wider world & Environmental care

Third and Fourth Classes

Strand: Living things

Variety and characteristics of humans

- become aware of the names and structure of some of the body's major external and internal organs

Human life processes

- develop an awareness of the importance of food for energy and growth
- understand the physical changes taking place in both male and female during growth to adulthood
- become aware of and investigate breathing
- Explore and investigate how people move

Integration

SPHE: Myself / History: Local studies

Strand Unit: Plant and animal life: The child should be enabled to

Variety and characteristics of living things

- observe, identify and investigate the animals and plants that live in local environments
- develop an increasing awareness of plants and animals from wider environments
- Observe and explore some ways in which plant and animal behaviour is influenced by, or adapted to, environmental conditions
- sort and group living things into sets according to observable features
- use simple keys to identify common species of plants and animals
- understand that plants use light energy from the sun
- come to appreciate that animals depend on plants and indirectly on the sun for food
- discuss simple food chains

Processes of life

- become aware of some of the basic life processes in animals
- investigate the factors that affect plant growth e.g. water, light, types of soil, temperature.

Integration

Geography: Natural environments

2. Strand: Energy and forces

Strand Unit: Light: The child should be enabled to

- learn that light is a form of energy
- recognise that light comes from different natural and artificial sources
- investigate that light can be broken up into many different colours
- investigate the relationships between light and materials
- investigate how mirrors and other shiny surfaces are good reflectors of light
- recognise that the sun gives us heat and light, without which people and animals could not survive
- be aware of the dangers of looking directly at the sun.

Integration

Geography: Human environments

Strand Unit: Sound: The child should be enabled to

- learn that sound is a form of energy
- recognise and identify a variety of sounds in the environment
- understand and explore how different sounds may be made by making a variety of materials vibrate
- design and make a range of simple string instruments using an increasing variety of tools and materials
- explore the fact that sound travels through materials i.e. air, water, wood, metal.

Integration

Music: Exploring sounds

Strand Unit: Heat: The child should be enabled to

- learn that heat can be transferred
- recognise that temperature is a measurement of how hot something is
- measure changes in temperature using a thermometer
- measure and compare temperatures in different places in the classroom, school and environment and explore reasons for variations
- understand that the sun is the Earth's most important heat source
- identify ways in which homes, buildings and materials are heated

Integration

Geography: Natural environments & Weather; Human environments

Strand Unit: Magnetism and electricity: The child should be enabled to

- learn that magnets can push or pull magnetic materials
- explore how magnets have poles and investigate how these poles attract and repel each other
- explore the relationship between magnets and compasses
- examine and classify objects and materials as magnetic and non-magnetic
- investigate that magnets attract certain materials through other materials
- explore the effects of static electricity e.g. plastic ruler, comb, glass rod
- observe the effects of static electricity on everyday things in the environment
- learn about electrical energy
- investigate current electricity by constructing simple circuits use wire, bulbs and batteries / experiment with simple switches
- examine and group materials as conductors (those that conduct electricity) and insulators (those that do not allow electricity to pass through)
- become aware of the dangers of electricity.

Integration

Geography: Human environment

Strand Unit: Forces: The child should be enabled to

- explore how objects may be moved by pushing and pulling, by twisting and stretching, by machines (e.g. rollers, wheels, pulleys)
- design and make a pulley system
- explore how some moving objects may be slowed down
- explore the effect of friction on movement through experimenting with toys and objects on various surfaces e.g. tiled surface, carpet, concrete, grass, table - top
- investigate falling objects
- explore how levers may be used to help lift different objects
- investigate the pushing force of water e.g. compare floating and sinking in fresh and salty water

3. Strand: Materials

Strand Unit: Properties and characteristics of materials

The child should be enabled to

- identify and investigate a range of common materials in the immediate environment
- recognise that materials can be solid, liquid or gaseous
- describe and compare materials, noting the differences in colour, shape and texture
- distinguish between raw and manufactured materials
- group materials according to their properties
- investigate how materials may be used in construction

Strand Unit: Materials and change: The child should be enabled to

Heating and cooling

- explore the effects of heating and cooling on a range of liquids, solids and gases
- experiment to establish which materials are conductors of heat or insulators

Integration

Geography: Natural environments & Weather

Mixing and other changes

- investigate how materials may be changed by mixing
- investigate the characteristics of different materials when wet and dry
- examine the changes that take place in materials when physical forces are applied
- explore some simple ways in which materials may be separated

Integration

Geography: Natural environments; Human environments

4. Strand: Environmental awareness and care

Strand Unit: Environmental awareness: The child should be enabled to

- identify positive aspects of natural and built environments through observation, discussion and recording
- identify the interrelationship of the living and non-living elements of local and other environments e.g. plants, animals, water, air and soil in habitats
- become aware of the importance of the Earth's renewable and non-renewable resources
- recognise how the actions of people may impact upon environments • come to appreciate the need to conserve resources

Linkage

Many of the objectives of this unit may be achieved as children complete work in other strands of the science curriculum.

Integration

Environmental awareness and care is a cross-curricular strand common to the science and geography curricula.

SPHE: Myself and the wider world & Environmental care Visual arts: an awareness of colours and textures in the environment will complement the work in this unit.

Strand Unit: Science and the environment: The child should be enabled to

- begin to explore and appreciate the application of science and technology in familiar contexts e.g. at home, at school, in shops in designing and making activities
- identify some ways in which science and technology contributes positively to society e.g.

transport, information and communication technologies, farming and medicine

- recognise and investigate human activities which have positive or adverse effects on local and wider environments protect flora and fauna, e.g. by creating and maintaining a school garden

Strand Unit: Caring for the environment: The child should be enabled to

- examine a number of ways in which the local environment could be improved or enhanced
- identify and discuss a local, national or global environmental issue
- realise that there is a personal and community responsibility for taking care of the environment.

Fifth and Sixth Classes

1. Strand: Living things

Strand Unit: Human life: The child should be enabled to

Variety and characteristics of humans

- develop a simple understanding of the structure of some of the body's major internal and external organs

Human life processes

- develop a simple understanding of food and nutrition
- develop an understanding of the reproductive systems of both male and female and of the physical changes taking place in both male and female during growth to adulthood
- become aware of and investigate breathing
- identify and understand ways in which the body protects itself against disease and infection e.g. role of external organs: nose and skin.

Integration

SPHE: Myself

Strand Unit: Plant and animal life: The child should be enabled to

Variety and characteristics of living things

- observe, identify and examine the animals and plants that live in local habitats and environments
- develop an increasing awareness of plants and animals from wider environments
- identify the interrelationships and interdependence between plants and animals in local and other habitats
- become aware of the sun as a source of energy for plants through photosynthesis
- observe and explore some ways in which plant and animal behaviour is influenced by, or adapted to, environmental conditions
- recognise that there is a great diversity of plants and animals in different regions and environments
- group and compare living things into sets according to their similarities and differences i.e. similarities and differences between members of the same groups or species
- become familiar with the characteristics of some major groups of living things
- construct and use simple keys to identify locally occurring species of plants and animals

Processes of life

- become aware of some of the basic life processes in animals and plants
- investigate the factors that affect plant growth e.g. water, light, soil, temperature • understand ways in which plants reproduce.

2. Strand: Energy and forces

Strand Unit: Light: The child should be enabled to

- learn that light is a form of energy
- know that light travels from a source
- investigate the splitting and mixing of light
- investigate the refraction of light
- investigate how mirrors and other shiny surfaces are good reflectors of light
- explore how objects may be magnified using simple lens or magnifier
- appreciate the importance of sight
- understand the role of sunlight in photosynthesis and appreciate that the sun gives us heat and light without which people and animals could not survive
- be aware of the dangers of excessive sunlight

Strand Unit: Sound: The child should be enabled to

- learn that sound is a form of energy
- recognise and identify a variety of sounds in the environment and appreciate the importance of noise control
- understand and explore how different sounds may be made by making a variety of materials vibrate
- design and make simple woodwind instruments • explore how sound travels through materials
- appreciate the importance of hearing.

Integration

Music: Exploring sounds

Strand Unit: Heat: The child should be enabled to

- experiment with a range of materials to establish that heat may be transferred in different ways e.g. through water, metals or air
- recognise a variety of sources of heat
- know that heat energy can be transferred - in solids (conduction) / in water and air (convection) / from the sun (radiation)

- measure and record temperature using thermometer.

Integration

Geography: Natural environments & Weather; Human environments

Strand Unit: Magnetism and electricity: The child should be enabled to

- learn that magnets can push or pull magnetic materials
- investigate how magnets may be made
- explore the use of magnets to lift and hold objects
- learn about electrical energy
- investigate current electricity by constructing simple circuits
- become aware of how some common electrical appliances work
- become aware of and understand the dangers of electricity

Integration

Geography: Human environments

Strand Unit: Forces: The child should be enabled to

- identify and explore how objects and materials may be moved
- explore the effect of friction on movement and how it may be used to slow or stop moving objects
- explore how friction can generate heat e.g. rubbing hands
- come to appreciate that gravity is a force
- become aware that objects have weight because of the pull of gravity e.g. design and make a spring balance
- explore how levers may be used to help lift different objects

3. Strand: Materials

Strand Unit: Properties and characteristics of materials

The child should be enabled to

- recognise that materials can be in solid, liquid or gas form
- identify and investigate a widening range of common materials in the immediate environment
- explore the origins of these materials
- group materials according to their properties and/or composition

- identify how materials are used
- recognise that a gas, such as air, occupies space, has mass and exerts pressure
- recognise that some materials decay naturally while others survive a long time in the environment
- become aware that air is composed of different gases
- become aware of some of the practical applications of these gases in everyday life

Strand Unit: Materials and change: The child should be enabled to

Heating and cooling

- explore the effects of heating and cooling on a range of solids, liquids and gases
- temporary changes (e.g. from solid to liquid to gas)
- expansion of water on freezing
- evaporation of water on heating
- permanent changes (e.g. those caused by baking bread in an oven)
- experiment to establish which materials are good conductors of heat or good insulators
- identify ways in which homes and buildings are heated and insulated
- recognise how heating and cooling can be used to preserve food

Mixing, separating and other changes

- investigate how a wide range of materials may be changed by mixing
- investigate the effects of light, air and water on materials
- examine the changes that take place in materials when physical forces are applied
- recognise that oxygen is required for burning
- explore some simple ways in which materials may be separated

Integration

Geography: Natural environments & Weather; Human environments

4. Strand: Environmental awareness and care:

Strand Unit: Environmental awareness: The child should be enabled to

- identify positive aspects of natural and built environments through observation, discussion and recording
- explore some examples of the interrelationship of living and non-living aspects of local and other environments
- become aware of the importance of the Earth's renewable and non-renewable resources
- foster an appreciation of the ways in which people use the Earth's resources
- come to appreciate the need to conserve resources

Strand Unit: Science and the environment:

The child should be enabled to

- appreciate the application of science and technology in familiar contexts at home, at school, in the work - place, in a factory, in hospitals, in designing and making activities
- examine some ways that science and technology have contributed positively to the use of the Earth's resources
- recognise the contribution of scientists to society
- recognise and investigate aspects of human activities that may have positive or adverse effects on environments

Strand Unit: Caring for the environment: The child should be enabled to

- participate in activities that contribute to the enhancement of the environment
- identify and discuss a local, national or global environmental issue
- come to appreciate individual, community and national responsibility for environmental care

Linkage

Many of the objectives of this unit may be achieved as children complete work in other strands of the science curriculum.

Integration

Environmental awareness and care is a cross-curricular strand common to the science and geography curricula.

SPHE: Myself and the wider world & Environmental care Visual arts: an awareness of colours and textures in the environment will complement the work in this unit.

1.1 Children's Ideas:

A variety of methods will be used to introduce topics, and these will include the children's ideas where appropriate. Different strategies will be used to find out what the children already know (e.g. observation, questioning, listening, problem - solving tasks, annotated drawings, teacher - designed tests and tasks, concept mapping and brainstorming). During scientific activities the children will be encouraged to question and discuss, to listen and problem solve through activities that try out, challenge, change or replace ideas.

1.2 Practical Investigations:

Practical investigations will be encouraged in all classes. A combination of teacher demonstrated/led investigations, closed activities and open investigations will be used (T.G. p54). Children will be encouraged to work scientifically and to raise their own ideas and questions, which will then be investigated.

In the middle and senior classes children will begin to recognise that a test must be fair (T.G. p20).

1.3 Classroom Management:

The use of a variety of approaches and methods will facilitate the efficient implementation of the science plan. These will include a teacher directed approach, an investigative approach and closed and open activities. Children will be encouraged to work out problems as much as possible. They will work in different groupings (e.g. individually, in pairs, in small groups, in large groups). Tasks will be set to promote co-operative and collaborative work. Opportunities will be given for children to share ideas and findings and display models/projects

1.4 Key Methodologies:

As a whole staff we will ensure that the key methodologies of the Primary School Curriculum are used. These include active learning, guided and discovery learning, free exploration of materials, use of the environment, learning through language, and opportunities to return to earlier learning and expand it. Differentiation: Activities will be adapted and/or modified at the teacher's discretion ensuring that all needs are catered for.

1.5 Linkage and Integration:

Teachers will identify a set of cross-curricular themes, which will enable them to integrate aspects of science with other subject areas. Science lessons will be utilised to develop language competence and confidence. New vocabulary will be taught as needed for science related activities. Maths, Geography, Music, Visual Arts, English, History, SPHE, PE, Religion.

Opportunities will be sought to link activities/concepts to other areas of the science curriculum eg. Linkage a unit of work on magnetism with properties and characteristics of materials. Events, as they arise such as National Tree Week, Science Week, whole school projects on Living things and the seashore will provide opportunities for linkage, both across the curriculum and within the teaching of Science as a discreet subject.

1.6 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. Within our immediate school environment, we make use of a variety of the following:

- Trees and creepy crawlies in the school grounds including minibeast motels set up in the school garden.
- Salthill Park – bluebells, dandelions and other wild flowers and the Horse Chestnut tree across from the park
- Tree trail – labelled trees in park behind Boys School
- Footpaths
- Seashore
- Birds in the school yard

- Pet Days
- Atlantaquarium
- Hatching duck and hen eggs

We have a tree trail around our school grounds. On an annual basis, when possible, we also give the children the opportunity to experience buddy teaching where the senior classes are paired with junior classes. As the senior classes explain the concepts to the junior children it reinforces and consolidates their own learning in Science.

Our Science plan reflects seasonal change. An example of this is where all classes observe their adopted tree during each season.

People and groups in the locality are used as a resource especially during science week (when possible).

Opportunities are provided on an ongoing basis to enable the children to explore the broader global environment e.g. trips to Turoe Pet Farm, Rathbawn Farm and Moherhill Farm, Ailwee Caves.

Visitors are welcome to the school but must first be authorised by the Principal and Board of Management. The teacher will be present at all times during any demonstrations given by a visitor to the school and this is in accordance with the school's own child protection procedures.

When going on field trips, the safety of the children is always a priority and the route, venue and suitability of the trip will have been previously surveyed and agreed by the teacher.

The school organises and participates in schemes to foster environmental awareness and care e.g. Green School project which involves the school having its own litter wardens, water conservation, energy conservation, green transport, biodiversity and global citizenship. Parents are encouraged to pack lunches in reusable containers and to bring home lunch litter. We also promote segregation of waste throughout the school. The yard is zoned to encourage children to take responsibility for the litter in their own area. The school is involved in the Keep Galway Clean calendar. The school has a Green Committee and there are two members elected to the committee from each class grouping. We have 'click teams' in each classroom to switch off the lights. During the winter months, bird feeding takes place. Parents and members of the wider community are involved in many aspects of the

Science Curriculum (when possible). The school also operates various recycling projects including old mobile phones, ink cartridges, batteries and stamps. Recyclable materials are used for Science and other subject areas within the school.

1.7 Balance between Knowledge and Skills:

We will develop the scientific skills through the content that is to be covered - questioning, observing, predicting, investigating and experimenting, estimating and measuring, analysing, recording and communicating. We will explore opportunities for developing the skills of designing and making i.e.: exploring, planning, making and evaluating.

Practical examples of this include: Questioning: What is this? Where does it live? (Infants) What is the name of this creepy crawly? (Middle classes) Does light travel in straight lines? How can this be tested? (Senior classes)

Observing: The gradual chances in living things and events over a period (all classes)

Predicting:

What will happen if the stone is put in water? Will it float or sink? (Infants) Which material is best for bouncing? (middle classes) What do you think will happen if we mix oil with water? (senior classes)

Investigation:

Examining leaves with magnifying glasses (Infants)

Explore how to make an instrument to make sound (middle classes) Exploring fair testing for the presence of starch in food (senior classes)

Estimating and measuring:

Compare and identify differences in measurements e.g. bigger/ heavier than (Infants) Compare and identify differences in sound e.g. high/low, soft/loud (middle classes) Use of appropriate simple instruments and techniques to record data on length, weight, mass and temperature etc. (senior classes)

Analysing:

Grouping objects according to colour, shape, weight etc. (Infants) Various methods of sorting and classifying a number of items e.g. a group of animals can be sorted by number of legs, food they eat etc. (middle classes). Look for and recognise patterns and relationships in making observations e.g. relationship between the amount of sugar that can be dissolved and the temperature of the water. (senior classes)

Recording:

Orally, pictorially and use of photographs (Infants)

Orally, using an increasing vocabulary, and representing findings using pictures charts, pictograms and drawings (middle classes)

Oral and written accounts, charts, graphs and diagrams (senior classes)

The skills of exploring, planning, making and evaluating will be developed at each class level.

In 2016, 2017 and 2018, 2019, 2020, 2021 the whole school has taken part in DPSM awards and we intend to continue with this practice.

2. **Assessment – Looking at Childrens' Work:**

Assessment will focus on knowledge objectives, understanding of scientific concepts, competence in the application of experimental and investigative skills and the cultivation of important attitudes.

A number of techniques will be used in collecting and recording information about pupil progress in science. They will consist of:-

- Teacher observations
- Teacher designed tasks and tests
- Work samples, portfolios and projects
- Concept mapping
- Curriculum profiles
- Self/peer assessment

Teachers will use some or all of these assessment methods to obtain a broad and balanced picture of the children's progress in science. They will also be used to help identify difficulties, to communicate to the pupils, parents and others, and to plan further learning for the child. Assessment will be ongoing and planning for assessment will be the subject of staff planning meetings to ensure continuity between classes. Progress will be discussed with parents during parent-teacher meetings and as part of the end of year report and will also be communicated to parents by way of homework and through displays of the children's work.

3. **Children with Different Needs:**

A variety of differentiating strategies will be employed including group work, pair work, one-to one instruction, differentiated activities, extra work for early finishers, further investigating challenges for children of exceptional ability, use of learning support staff and SNA's in the classroom during science lessons, visual clues for those who do not have English as a first language and use of ICT for recording and fact finding. Buddying systems are employed where appropriate.

4 **Equality of Participation and Access:**

All children are provided with equal access to all aspects of the Science curriculum. All boys and girls are provided with equal opportunities to engage in scientific activities. No child is excluded from trips or exhibitions.

Opportunities are provided within the Science programme to broaden the pupils' understanding of other cultures and environments e.g. fabrics used in warmer countries, colours of clothing, materials used for building homes.

In collaboration with the class teacher and SET teachers, we will provide extra support for children with learning difficulties and children whose first language is not English.

Organisation:

5 . Timetable:

The time allocation for SESE in the Infant classes is 2 hours and 15 minutes.

The time allocation for SESE from First to Sixth Classes is 3 hours.

Science Week has been celebrated each year within the school through attending various events that take place at local venues including Atlantaquarium, Leisureland, NUIG, GMIT and other events and competitions in the classroom. When drafting timetables for withdrawal of pupils for supplementary teaching, teachers make every effort to include these pupils for as much of the science programme as possible.

6 **Resources and Equipment:**

Textbooks

- Junior Infants – None. Resources sheets to be sourced from a variety of different textbooks as necessary.
- Senior Infants – None. Resources sheets to be sourced from a variety of different textbooks as necessary.
- First Class – SESE Programme: Small World CJ Fallon
- Second Class – SESE Programme: Small World CJ Fallon
- Third Class – SESE Programme: Small World CJ Fallon
- Fourth Class - SESE Programme: Small World CJ Fallon
- Fifth Class SESE Programme: Small World CJ Fallon
- Sixth Class – Science Quest

GENERAL

- The environment
- Set of Switch on Science posters by Heinemann
- Plus software Sun, earth, bulb apparatus
- Navigational compasses Magnifying glasses (big and small)
- Metre sticks
- Height charts
- Bug viewers
- Periscope
- Magnetic farm and magnetic zoo
- Metal detector
- All Around me posters
- What a wonderful world posters
- Daily Mail set of posters – sea shells, shore line, small mammals, salt water fish, fresh water fish, whales and dolphins, trees, garden birds, sea birds, wonderful waders
- Set of Magic Emerald Posters
- Planets poster Gardens at night poster
- Posters on seasons, body parts, animals
- SEI large books and posters on energy efficiency x 2
- Autumn, winter, spring, summer posters
- Sandboxes x 2

Myself/Human Life

- Height chart
- Thermometer
- Measuring tape
- Bathroom scales
- Half scale anatomical torso

Animals and plants

- Flower pots
- Small trowels
- Old spoons
- Watering can
- 2 x binoculars
- Butterfly Pavilions x11

Light

- Spoons
- Biscuit tin lids
- Candles
- Projector

Light Kit Orange Box - contents

Concave/Convey mirrors

100 x 100 mm flat mirrors

150 x 250 mm flat mirrors

75 x 25 mm flat mirrors

Perspex block

Rectangular prism

Glass lens 5 cm double convex

Converging lens Concave/Convex

Diverging lens Concave/Convex

Double lens Concave

Plano lens Concave

Plano lens Convex

Combs

Heat

- Thermometers
- Candles

Heat, Air & Water Kit Pink Box – contents

- Plungers
- Thermometers
- Wooden spoon
- Plastic spoons
- PH paper Night lights
- Night light stand
- Metal dishes
- Packet of filter paper

Forces

- Sandpaper
- Tongs
- Pliers
- Marbles
- Stop watch
- Balloons
- Plastic syringes

Forces & Motion Kit – Purple Box - Contents

Newton Meters 1kg Brown

Newton Meters 3kg White Newton

Meters 5kg Yellow

Single pulley

Double pulley

Retort stand base

Retort stand rod

Retort stand Boss Head

Retort stand clamp

Set of weights

Materials

- Funnels
- Sieves
- Fabric and fibres
- Dyestuffs
- Chalk
- Pump

Making

- Hammer and nails
- Sandpaper
- Screwdriver and screws
- Craft knife
- Rulers

- Scissors
- Clips
- Needles
- Consumable materials
- Plasticine
- Plaster of paris
- Paper clips
- Clothes
- pegs
- Thin wire
- String
- Thread
- Adhesive Paints

Magnetism Kit Blue Box – contents

- Disk magnets
- Latch magnets
- Washer magnet
- Large bar magnets
- Small bar magnets n/s
- Horseshoe magnets small
- Box of magnetic clips and magnet
- Ball magnets
- Iron filings
- Lodestone magnetite rocks
- Magnetic tape
- Packet of steel shapes
- Jumbo horseshoe magnet
- Alnico horseshoe magnet

Electricity Kit – Red box –

contents2 x reed switch with

magnet

4.5v standard batter flat

shape5-amp connector strip

7.9mm push fit pulley

AA size standard battery

Battery holders – single

Battery holders + leads 1 x AA

Battery holders double

Battery snaps

Bell push switch

Buzzers C size standard battery

Cable ties

Crocodile lead double ended

Electric motor

Green giant 8mm LED

Introduction to electricity

Knife switch double pole

Mercury till switch metal case

MES Batton Holder/Bulb holder

MES Flashing bulb 2.5v

MES lens ended bulb 2.2v

MES screw bulb 3.5v

Micro switch with lever

Micro switch with roller lever

Push to make switch black

Push to make switch red Red giant 8mm LED

Variable resistor switch

Yellow giant 8mm LED

Central Kit – Green Box - contents

- Aluminium foil A4 sheet
- Automatic wire stripper
- Coach bolts
- Drawing pins

- Paper clips
- Roll black wire
- Roll red wire
- Small pieces of wood
- Small screwdrivers
- Split pins
- Steel wool
- Wire nails
- Box matches (long)
- Box of straws
- Food dyes
- Insulating tape
- Packet of needles
- Compass
- Pack of balloons
- Pack elastic bands
- Cardboard tubes
- Lollipop sticks
- Wooden rulers
- Torch
- Pyrex flasks
- Ball of string
- Metal strips 671103
- Funnels
- Rubber stoppers 1 hole
- Rubber stoppers 2 hole
- Tongs
- Plastic tubing 5 meters
- Steel nails

Sound Kit - contents

- Acrylic tube
- Clay stick
- Marble Paper clip
- Pin
- Plastic cup
- Plastic ruler
- Plastic tray
- Rope
- Rubber ball
- Rubber bands, assorted

- Rubber mallet
- Sand paper assorted
- Slinky Sound tube
- String Styrofoam cup
- Tuning fork
- Vial

Digiwiz Models - 5th and 6th

Digiwiz Wriggling Worm Robot x 3
Digiwiz Crawling Gecko x 3
Digiwiz Buzz the Wire x 3
Digiwiz Salt Water Car x3
Digiwiz Mini Safe x3
Digiwiz Floor Mopping Robot x3

18 sets to be shared

Digiwiz Wandering Robot x9
Digiwiz F1 Car x9
18 sets to be shared

Digiwiz Flop along Robot x9
Digiwiz Drawing Robot x9

18 sets to be shared

Equipment suppliers

- ABC Bookshop, Letterkenny 074 – 27299
- Alchem, Little Island Ind Est, Cork 021 – 354188
- Carroll Educational, Unit 5, Western Ind. Estate, Naas Road, Dublin 01 – 4567279 - First Class, Dublin 01 2875119
- Hope, Dublin 01 – 6264666
- Lennox, Naas Road, Dublin 01 8727799
- Peats, 197 Parnell Street, Dublin 1 01 8727799
- Shaws Scientific, Greenhills Industrial Estate, Walkinstown, Dublin 12 freefone 1800 924121

Websites for Primary Science

- Association for Scientific Education www.ase.org.uk
- BNFL – British Nuclear Fuels Ltd www.bnfl.com
- Chester School of Education www.chester.ac.uk
- Gareth Pitchford's Primary resources www.primaryresources.co.uk
- Internet for Girls, World Wide www.sdsc.edu/~woodka/resources.html
- Resources list enfo www.enfo.ie
- ESB www.esb.ie
- Natural History Museum London www.nhm.ac.uk/education/quest2/english
- The Exploratorium San Francisco www.exploratorium.edu
- Roger Frost's website www.click-on.to/RogerFrost
- SCI centre Primary Science Self study materials www.le.ac.uk/education/centres/sci/selfstudy.html Science Museum London www.nmsi.ac.uk/online/kids/index.html
- Scoilnet: www.scoilnet.ie
- Shell Ireland www.shellireland.com
- Teaching ideas for Primary teachers www.teachingideas.co.uk
- Wild Ireland www.wildireland.ie
- Astronomy Ireland www.astronomy.ie
- Association for Science Education www.ase.org.uk
- BBC Science in action www.bbc.co.uk/sia
- Education Resource information Centre http://ericir.syr.edu
- Elementary Science support centre www.essc.calumet.purdue.edu
- Animals of the World www.kidscom.com
- You can Beakman and Jax http://beakman.com
- Nye Labs Online http://nyclabs.kcts.orgs
- Sandlot Science www.sandlotscience.com Kinetic City Cyber Club www.kineticcity.com
- Build the best paper plane in the World www.zurqui.com/crinfocus/paper/plane/airplane.html
- Animal Pictures archive www.best5.net/animal
- The Soundry http://library.thinkquest.org/19537
- Chem4kidswww.chem4kids.com
- Paddy Madden http://www.blackrock-education.ie/environment/
- Birds http://www.birdsireland.com
- Pcsp www.pcsp.ie
- Sdps www.sdps.ie
- Ncte www.ncte.ie/internetsafety
- Des www.education.ie
- NCCA www.ncca.ie

- INTO www.into.ie
- IPPN www.ippn.ie
- NPC Primary
- www.npc.ie
- www.primaryscience.ie
- www.sciencekids.co.nz
- www.bbc.com
- Youtube
- www.esysciencefor kids.com

7 Safety:

Scoil Íde endeavours to provide a safe teaching and learning environment and children are taught about the need for safe procedures and routines e.g. children should not look at the sun, plastic mirrors should be used for investigations, pupils should never look at the sun through lenses, children should be made aware of the dangers of sunburn.

With regard to electricity, children will be made aware of the safety issues associated with the use of mains electricity and electrical appliances. Mains electricity will never be used during science investigations. The children will be made aware of the following safety considerations: -

- the dangers of touching a plug when hands are wet

- the importance of not using electrical appliances without adult supervision

- batteries should be disposed of in a safe manner

- wires will only be stripped by an adult using wire cutters

With regard to the safety and care of magnets, these will be stored carefully to preserve their magnetism. The children will be advised that repeatedly dropping magnets will cause them to lose their magnetic properties. Care will be taken during work on forces because of the risk of injury resulting from moving objects.

When organising tests using hot water, children will use water at a temperature that is safe for them.

Outdoor work will be based in safe areas that are accessible for children, teachers and helpers. Preliminary visits by teachers to the site can be used to identify potential hazards. Adequate adult supervision will be given to the children at all times. These adults will be aware of the hazards that may be encountered and the procedures to be adopted in the event of emergencies. The teacher in charge of the field trip will have a mobile phone on his/her person.

8 Homework:

Science homework will be given periodically to reinforce the learning in the classroom e.g. finishing off written reports, simple experiments, designing and making, sourcing recyclable materials. Children will be reminded again of safety issues when doing assignments at home.

9 Individual Teachers' Planning and Reporting:

School planning for Science is done on a collaborative basis to ensure continuity of children's learning and also to ensure that all the Strands and Strand Units of the Curriculum are adequately covered. In their individual notes, teachers plan using the Strands and Strand Units and content objectives as set out in the School Plan and Science Curriculum. To assist teachers in their planning, cúntas míosiúil are readily available to all teachers on our Shared Drive. The Science Co-ordinator is responsible for co-ordinating and providing advice to teachers in their planning.

10 Staff Development:

In Scoil Íde, we work collaboratively, sharing ideas, resources, talents and expertise. Teachers are encouraged to attend courses and, in the past have attended courses at the Teacher Centre.

Teachers will be encouraged to visit science related websites, especially www.scoilnet.ie, www.pcsp.ie, www.ncca.ie, www.sdps.ie, www.into.ie and other websites as outlined in the resources section.

Time will be allocated at staff meetings to discuss aspects of the Science Curriculum. Teachers with expertise in this area will be encouraged to share their knowledge and experience with other staff members. The support of the PDST Cuiditheoir service will be welcomed.

11 Parental Involvement:

Parents have always played an important role in Scoil Íde and we welcome their help and involvement in supporting the Science plan. Opportunities for parental engagement in fostering in their children an interest in Science may occur in the following ways: -

Parents who have Science expertise - support during fieldwork – outlined above under Health and Safety

- Other class visits in order to share knowledge on Living Things, Forces etc, Invitation to Science Day displays

- Supporting and helping children in making and designing, exploring and other science homework

Assisting children with research at home, including internet research. - Parents accompanying family pets to school while child speaks of their pet's care and needs (when possible).

12 Community Links:

Scoil Íde seeks to forge strong links with the local community. Local individuals in the community with expertise in environmental/science issues will be invited to talk to children from time to time.

People who have done this for us in the past and who we will call on again in the future include a firefighter, orthopaedic surgeon, nurse, GP, dentist, Gordon D'Arcy, Ann McKeown, an expert on tides etc.

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

- Implementation of revisions in the Science curriculum will be evident in teachers' work
- 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

(a) Roles and Responsibilities:

The Science coordinator in our school will co-ordinate the progress of the plan, encourage and accept feedback on its implementation and report to staff on findings. The plan will be monitored by the coordinator through consultation with the teachers and principal and will be evaluated and updated periodically.

(b) Timeframe:

The plan was implemented in 2004 and revised in September 2007, March 2014, Dec. 2018 and Feb 2022.

Review

(a) Roles and Responsibilities:

Those involved in reviewing this plan include principal, teachers, pupils, parents, Science Co-ordinator, BOM. The Science Co-ordinator in our school will be responsible for coordinating this review.

(b) Timeframe: The plan will be reviewed in February 2024

Ratification and Communication

The reviewed plan will be presented to the BOM for ratification and will be communicated to all members of the school community

Ratified by Board of Management on: _____

Signed: _____