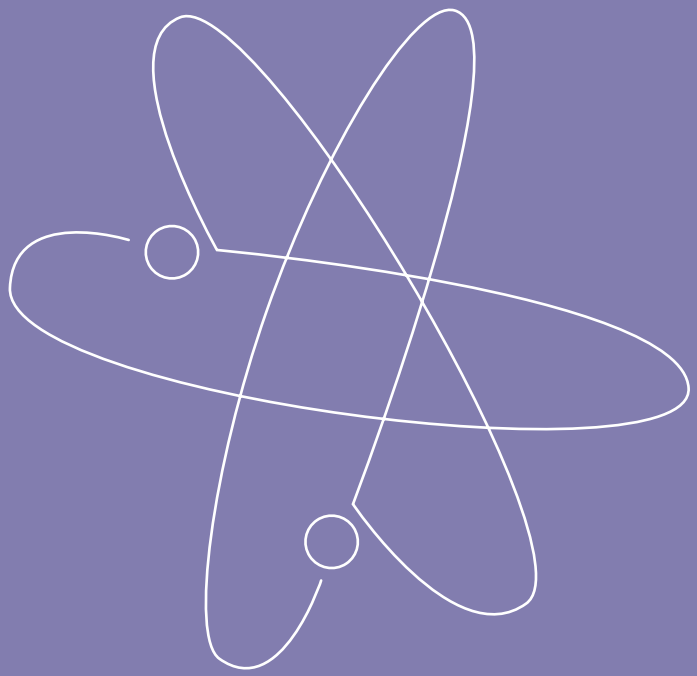
PRIMARY

Social, Environmental and Scientific Education: Science

Guidelines for Teachers of Students with

SEVERE and PROFOUND

General Learning Disabilities



NCCA
National Council for Curriculum and Assessment
An Chomhairle Náisiúnta Curaclaim agus Measúnachta

Contents

SESE: Introduction

This aspect of education has always been regarded as an extremely important part of the curriculum in schools catering for students with general learning disabilities.

SESE offers opportunities for the introduction of a broad range of experiences that will greatly enrich and enhance the student's understanding of their familiar and wider surroundings.

This area of the curriculum involves understanding and relating to the environment in a way that is real and meaningful for each student. It encompasses history, geography and science and enables students to explore and investigate actively the natural, human, social, and cultural environment in which they live. It helps students to develop a sense of what part these aspects of life play in the wider scheme of things.

History

History is concerned with knowledge of the lives of people in the past and how this is interpreted. For students with severe and profound general learning disabilities, personal experiences and elements of family history will be to the forefront. The history curriculum also seeks to enable the student to make sense of the passing of time. It aims to familiarise him/her with the ability to gather evidence about things that happened in his/her own environment, to examine that evidence, and to draw simple conclusions from it. This can provide the student with an insight into the way in which historians go about their work.

Geography

Geography encompasses the study of the Earth, its inhabitants, and the relationships between them. It is particularly concerned with themes of place, space and the environment. For students with severe and profound general learning disabilities, this begins with gaining an awareness of one's own place and the place of familiar people in the immediate environment. Mobility around the school and the local environment is a critical need for many students. The Geography curriculum has much to offer in this respect. The curriculum also places an emphasis on observing and exploring the richness of the immediate environs of the school and home, and seeks to foster a sense of individual and community responsibility for environmental care.

Science

Science is concerned with enabling the student to gain knowledge and understanding of the physical and biological aspects of his/her environment. The curriculum emphasises the importance of starting with what is familiar to the student in the everyday environment. As his/her skills of observation and investigation are developed work can be broadened to include the wider environment.

I am a student learning to understand and relate to the environment, whose teacher is using these SESE guidelines

What can I learn through history?	What can I learn through geography?	What can I learn through science?
■ I can engage activities to help me to understand the passing of time throughout the day/ week/year. ■ I can learn to associate special events with particular times of the day/week/year. ■ I can develop ways of remembering meaningful events and be helped to understand that they happened in the past. ■ I can work on strategies to help me to use the pattern of routine events in the past in order to anticipate future patterns of events. ■ I can learn to use skills of investigation to find out about past events. ■ I can work on projects to help me develop a sense of my own personal history. ■ I can participate in outings to enable me to experience the ambience of buildings and places associated with the past.	■ I can gain an insight into my role as a member of different groups. ■ I can develop an awareness of the variety of homes in which people live. ■ I can work on projects that help me to understand the roles of people who are familiar to me in my environment. ■ I can improve my understanding of my own position in my immediate environment. ■ I can participate in activities to help me find my way around my familiar daily environment. ■ I can participate in activities to help me to take an interest in and make sense of unfamiliar environments. ■ I can work on projects to help me become aware of weather and seasonal changes. ■ I can learn how to take care of the immediate and the wider environment. ■ I can become aware of all the different ways in which I can use my environment.	■ I can explore and experiment with a wide range of materials. ■ I can increase my awareness and understanding of plants in my environment. ■ I can find out about animals in my environment. ■ I can participate in activities to help me make sense of sources of energy around me. ■ I can participate in experiments to alert me to the changes that occur in materials and food when energy is applied to them. ■ I can increase my awareness and understanding of changes in my environment.

Science: Introduction

The *Primary School Curriculum, Science* has the potential to be novel and creative, with exciting and motivating activities that often capture the attention of students whose attention span is limited.

While students may not understand the more complex concepts underlying scientific activities, they should not be denied the opportunity of scientific experience.

Introduction

The content of the *Primary School Curriculum, Science* is presented in three strands:

- Living things
- Energy and forces
- Materials.

The skills of working scientifically and designing and making are built into the activities in the science programme. Environmental awareness and care is dealt with in the *Primary School Curriculum, Geography* and *Primary School Curriculum, SPHE.*

Activities in science aim to raise the student's awareness of and interest in the way in which things work in the immediate and local environment. They help to develop an awareness of cause and effect and involve building up knowledge that enables the student to anticipate and predict. Active participation at the student's own level of ability leads gradually to the development of knowledge and skills. Small signs of interest are nurtured, and the student's curiosity is stimulated and encouraged through incidental, playful and structured opportunities for exploration.

Activities are suggested that can enable the student to explore of the characteristics of animals and plants and their place in the local environment. Observing and looking after plants and animals can enhance student's understanding of what is needed for life and can encourage respect for living things. Incidental opportunities to bring animals into the classroom safely can provide valuable experiences for students who rarely come into contact with animals. The environment around the school may offer rich opportunities to explore and investigate plant life, and the local environment should be fully used as a source of scientific wonder. Trips into the wider environment may be necessary to provide variety and to stimulate interest and curiosity.

Activities should be planned to allow the students to explore and experience different forms of energy, such as light, sound and heat. Structured play with objects, toys and water will lead the students towards an understanding of the different forces that have an impact on their immediate environment. Many activities are aimed at increasing awareness of and stimulating the desire to explore the characteristics of everyday materials. Engaging in scientific activities promotes interaction between adult and student and stimulates meaningful interaction with peers. Working collaboratively on a variety of group projects enables students to share strengths and to learn from each other.

All staff members should observe safety procedures when structuring science activities, and every effort should be made to enable students to learn about and adopt safe practices.

School planning

Much of the planning advice in the *Primary School Curriculum, Science,* will be applicable when planning for students with severe and profound general learning disabilities. The following section outlines some additional aspects of planning that may need to be considered when planning for these students.

Curriculum and organisational planning

The following additional issues may need to be discussed as part of the school's planning for science.

The purpose and nature of science in the school

A discussion on the general approaches that will be adopted to science will promote a co-ordinated and collaborative approach to the planning and teaching of science throughout the school. Exploring and discussing the nature of science can help to clarify for all school staff the role which science may play in the overall education of the student.
A discussion on the resources that are needed for science will be guided by the fact that the *Primary School Curriculum, Science,* for these students deals mainly with investigating the familiar environment. Teachers may have access to particular resources and other resources that need to be purchased should be identified. An agreed plan for their use should be drawn up that will ensure maximum benefit to all students and teachers.

Exploring the school environment

If the school grounds do not already have a rich variety of plants thought could be given to creating an area or areas where plants might be grown. This could become a whole-school project and could have benefits in a range of curriculum areas. Special attention could be given to choosing plants that will have maximum sensory impact in colour, smell and that are safe to taste. Herbal plants can offer particular opportunities for exploration. Such a garden area could also incorporate interesting stones, pieces of driftwood, or simple water features.

The school environment can also be made scientifically interesting by setting up a bird table outside each classroom window.

Exploring the local environment

The planning process should involve teachers in becoming familiar with the locality of the school, the range of habitats in the area, and other interesting features of the local natural environment. Parents/guardians can play a central role in identifying places that could be used in the science programme.

Safety procedures will need to be drawn up for science visits in the locality.

A broad and balanced curriculum

The amount of time spent on science will vary according to the strengths and needs of each individual student, but careful school planning will ensure that time spent on science will offer maximum benefits. The student learns about his/her environment through active participation and exploration. Therefore, the broadest possible range of experiences should be offered to each student, engaging him/her in any activity at his/her own level and with his/her own particular needs in mind.

The *Primary School Curriculum, Science* offers valuable opportunities to explore and investigate the immediate and wider environment. Every student, however complex his/her disability, can benefit from practical activities that can help him/her to make sense of the world in which he/she lives.

Science: Classroom planning

Many excellent ideas are to be found in the planning sections of the *Primary School Curriculum: Science, Teacher Guidelines.* Possible additional issues are referred to on the following pages.

Planning and organisational issues for the teacher

Additional planning issues might include the following:

- All staff members working with the students should be aware of safety practices before science lessons.
- Most students will need individual help for scientific exploration activities. It may be necessary to secure extra help, to plan group work, or to incorporate turn-taking routines in the lessons.
- Students' reactions to new experiences should be observed carefully. Any sign of apprehension or discomfort should result in the immediate cessation of the activity.

Listening and responding

Social, environmental and scientific education: Science

Understanding and relating to the environment through science

Attending	Responding	Initiating
Living things *The student should be enabled to* ■ attend to the varying physical characteristics of himself/herself, adults, and other students (See the *SPHE Curriculum.*) ■ become aware of plants in the immediate environment – *look at/touch/smell/taste (where appropriate) plants inside/outside the classroom* – *listen to the crackle of autumn leaves* ■ attend to similarities and differences between plants in the immediate environment – *examine collections of plants with flowers* – *rub fresh leaves versus old leaves* – *look at and feel shapes/textures/veins in leaves* – *compare the textures of bark on different trees* ■ with appropriate help gather and/or examine a collection of plant seeds – *conkers, acorns, poppy seeds, wheat* ■ participate in taking care of plants in the immediate environment – *plant plants/seeds in the soil of the garden or in pots* – *help to water plants in the classroom/in the school garden/at home* – *care for an aromatic herb garden inside/outside classroom.*	**Living things** *The student should be enabled to* ■ show awareness of the varying physical characteristics of himself/herself, adults, and other students (See the *SPHE Curriculum.*) ■ show an interest in plants in the immediate and wider environment – *examine different parts of plants using all the senses when encouraged* ■ show awareness of similarities and differences between plants (See *Attending.*) ■ show interest in caring for plants in the immediate environment – *imitate or help with plant care (watering, weeding, taking in when the weather is frosty)* – *respond to instructions not to damage plants in the classroom/school grounds* – *begin to realise that he/she should have the permission of an adult to pick flowers/plants* ■ show a response of pleasure, interest or anxiety in the presence of animals.	**Living things** *The student should be enabled to* ■ show understanding of the varying physical characteristics of himself/herself, adults, and other students (See the *SPHE Curriculum.*) ■ show curiosity about plants in the local environment – *enquire by expression, gesture or vocalisation about plants inside or outside the classroom* – *examine different parts of plants (leaves, stems, flowers, bark, seeds, roots)* – *identify some familiar parts* ■ identify independently similarities and differences in plants – *point out similarities and differences in activities such as those in Attending* – *group different plant parts (using real plants or photographs group by leaves, seeds, flowers)* ■ have responsibility for the care of some plants in school or at home – *have the job of watering/weeding plants at home/in school* – *notice the growth of plants, know not to damage plants in the wider environment* – *know that he/she should have the permission of an adult to pick flowers and plants.*

Attending	Responding	Initiating
Living things	**Living things**	**Living things**
■ become aware of insects and animals in the familiar environment by looking, touching, listening, and smelling – *look at or listen to animals when his/her attention is drawn to them* – *watch how they move* – *stroke them when it is safe to do so* – *with full help gather worms for a short period and look at them* ■ have the opportunity to visit animals in wider environments, – *trips to a farm/the zoo.*	■ given prompting, identify animals in the familiar environment using objects of reference, pictures, vocalisation, or verbalisation – *respond to 'Show me the dog'. (shown in stories or on a screen, show recognition of the sound of a dog barking)* ■ show interest in insects in the immediate environment – *look at a spider in classroom when it is pointed out* – *show interest in looking at insects in their natural environment (on flowers/on bushes/under a big stone)* – *gather and look at insects such as worms/caterpillars for short periods* – *help to return insects to their habitats* ■ show reaction to unusual animals – *respond to unfamiliar animals at a farm/in the zoo* – *show special interest when his/her attention is drawn to animals in books/on the screen that are obviously unusual (a giraffe with a long neck, a peacock with feathers fanned out, a lion with a big roar, monkeys making chattering sounds).*	■ watch animals with interest and seek to interact with them when allowed/when it is safe to do so – *by stroking, feeding, grooming trusted animals* ■ investigate insects in the local environment – *draw an adult's attention to insects when he/she sees them* – *go regularly to check under a designated big stone to look at insects underneath* – *gather insects for short periods of observation when in the company of an adult* – *show care when handling insects and in returning them to their habitat* ■ independently identify familiar animals – *point out a dog/bird when out walking* – *point out favourite animals in books* – *imitate the sound of a dog barking or a cat mewing to draw attention to these animals* – *use words/signs/pictures to communicate about familiar animals* ■ communicate about unfamiliar animals in real life/in books/on the screen – *act with curiosity when he/she is presented with unfamiliar animals* – *look to an adult for direction on interacting with unfamiliar animals* – *attempt independently to represent unusual animals by gesture/by vocalisation/in art work.*

Attending	Responding	Initiating
Energy and forces *The student should be enabled to* ■ use the senses to develop awareness of the energy of light – *look at and participate in exploring different light sources (window/candle/ lamp/torch/lighting toys/ lights in a sensory room/ ultraviolet light)* – *have opportunities to experience safely contrasts of darkness and light* ■ increase awareness of colour in the immediate and local environment – *have his/her attention drawn to the colour of inanimate and living things (See the Primary School Curriculum, Mathematics, and the Primary School Curriculum, Visual Arts.)* ■ become aware of a variety of sounds in the environment – *have attention drawn to familiar and unfamiliar sounds (See the Primary School Curriculum, Music.)*	**Energy and forces** *The student should be enabled to* ■ help with/imitate experiments with light – *experiment in making the room very dark by covering the windows with dark material* – *shine a torch on surfaces or through fabric/paper, light a candle* – *show reaction as bubbles are blown and light is shone on them* – *reflect daylight on reflective surfaces safely (a mirror/a biscuit tin lid/holographic paper)* ■ show reaction to differences in light by expression/gesture/ vocalisation – *show different reactions to different light sources* – *show preference for certain types of light, close the eyes when in bright sunlight* – *open the eyes when in the shade* – *experiment with making shadows using light (See Attending.)* ■ show interest in colour in the immediate and local environment – *show reaction to the colours of plants/animals/materials when pointed out* – *match colours of natural and constructed materials* (See the *Primary School Curriculum, Mathematics* and the *Primary School Curriculum,Visual Arts.*)	**Energy and forces** *The student should be enabled to* ■ experiment with and communicate about light and light sources – *switch on and off lights in the classroom/around the school/at home* – *switch on and off lighting toys* – *communicate discomfort if light is too bright* – *communicate about changes in light* ■ show curiosity and creativity when experimenting with light – *carry out some steps of familiar experiments independently* – *have fun making shadows with light* – *show understanding of the value of shade when the sun is too hot outside* (See *Responding.*) ■ notice and draw attention to colour in the local and wider environment – *draw an adult's or peer's attention to interesting colours in the environment* – *make sets of coloured items such as autumn leaves/shells* (See the *Primary School Curriculum, Mathematics* and the *Primary School Curriculum,Visual Arts.*) ■ communicate about sounds in the environment – *draw attention to sounds that mean something to him/her* – *show curiosity about the sources of strange sounds* – *listen to distant sounds.*

Attending	Responding	Initiating
Energy and forces	**Energy and forces**	**Energy and forces**
■ attend to experiments with sound – *attend to a variety of vocal sounds (tone, pitch, volume)* – *listen to his/her own sounds and the sounds others make, make sounds such as sneezing/coughing* – *make sounds louder and softer (turning up a radio to increase sound,* – *putting a ticking clock into a box or covering it with a heavy cloth to dull sound),* – *attend to experiments with vibrating sound (plucked guitar strings, rice poured on a drum, a plucked elastic band stretched across a box, objects dropped on resonance-boards).*	■ respond to sounds in the environment and identify their sources – *turn his/her head towards sounds, gesture/vocalise in response to meaningful or interesting sounds* – *repeat actions that make sounds when prompted* (See the *Primary School Curriculum, Music.*) ■ experiment with sounds in the environment – *show reaction to sound in the experiments suggested in Attending* – *with help make and use a string telephone (using two plastic cups or yoghurt pots joined with string).*	■ explore ways of making different sounds using a variety of materials – *show curiosity and creativity when experimenting with a variety of materials to see what sounds they make* (See *Attending* and *Responding.*) – *use a string telephone at increasing distances and with one user out of sight* (See the *Primary School Curriculum, Music.*)

Attending	Responding	Initiating
Energy and forces *The student should be enabled to* ■ become aware of familiar sources of heat – *safely experience heat coming from a classroom heater/the sun/an oven* ■ develop awareness of the difference between hot and cold – *have opportunities to compare hot and cold food/ drinks safely* – *participate in feeling hot (not too hot!) and cold things* – *feel warm air coming from a hairdryer or blow heater* – *feel cool air coming from a fan* ■ have his/her attention drawn to changes in weather temperature ■ become aware of how to keep people and objects warm or cold – *observe the use of and participate safely in using an oven/a microwave oven/a fridge* – *attend to the putting on/taking off of clothes depending on temperature* – *experience the heat given off by a heater/the cooling effects of a fan.*	**Energy and forces** *The student should be enabled to* ■ indicate sources of heat when asked – *natural and artificial sources of heat* (See *Attending.*) ■ show awareness of the difference between hot and cold by expression, gesture, vocalisation, or verbalisation – *show preference for hot or cold drinks/food* – *show reaction when experimenting safely with hot and cold things* – *show reaction to hot or cold weather* ■ show awareness of and identify on request items that control temperature – *an oven, a fridge, a microwave oven, clothes, the sun, a fan.*	**Energy and forces** *The student should be enabled to* ■ recognise how to keep things warm or cold – *know that clothes keep us warm* – *use the microwave oven or ask an adult to use it to heat his/her food* – *choose to sit in the shade if sun is too hot* – *operate a fan to stay cool* – *know that certain foods should be kept in the fridge* ■ communicate about the difference between hot and cold – *make demands about the preferred temperature of his/her food or drink* – *know what is hot and what is cold when participating in experiments* – *communicate about the temperature of the weather.*

Attending	Responding	Initiating
Energy and forces	**Energy and forces**	**Energy and forces**
■ attend as magnets of different shapes and sizes are used to attract a variety of materials – example *watch and participate with full help in experiments involving magnets* ■ attend to sensory experiences provided by a variety of electrical and battery-operated equipment – *participate with full help in operating equipment* – *attend to visual and auditory experiences provided by computer/battery-operated toys* – *feel sensory experiences afforded by a fan/vibrating equipment* – *listen to and watch the operation of household electrical equipment such as a vacuum cleaner/a food mixer/a washing machine* ■ become aware that electrical appliances must be treated with care – *listen to warnings about the dangers of electricity, attend to rules given about the use of appliances.*	■ show surprise or interest when objects are attracted using magnets ■ respond to or imitate the operation of a variety of electrical and battery-operated equipment (using switches where appropriate) – *switch equipment on or off, adjust the volume control* (See *Attending* and *Initiating*.) ■ show awareness of the need to treat electrical appliances with care and respect for danger – *follow instructions for their safe use, respond to warnings about common dangers* ■ with decreasing assistance carry out and imitate actions of exerting force safely on objects – *pushing/pulling/squashing/ bouncing/swinging/ rolling/ blowing* – *experiment with elastic/push and pull springs* – *use a slinky, use a spring-operated toy such as a wind-up car or a Jack-in-the-Box,* – *blow papers across a paper, go outside on windy days and look at the effects of the wind blowing.*	■ use magnets in purposeful play to explore their effects on different materials ■ initiate the operation of electrical and battery-operated equipment in order to gain sensory feedback – *turn on a tape recorder/ a light* – *use a switch or voice activated toy* (See *Attending*.) ■ link everyday appliances with their functional use at school and in the home – *get a hairdryer after having a shower or going swimming* – *have responsibility for using electrical equipment safely to carry out tasks at home and in school* ■ observe safety rules about the use of electrical appliances independently (following visual or recorded auditory cues if necessary).

Attending	Responding	Initiating
Energy and forces	**Energy and forces**	**Energy and forces**
■ observe and experience forces such as pushing, pulling, squashing, bouncing, swinging, rolling, blowing – *experience these forces gently on himself/herself* (see the *Primary School Curriculum, PE*) – *attend to the effects of exerting force on objects and materials such as clay and play-dough* (See *Responding*.) ■ experience himself/herself speeding up and slowing down – *in a wheelchair, on a bike, on a roundabout, being pulled on a blanket.*	■ show interest in making objects go faster or slower – *push/throw/kick a ball hard to make it go fast* – *apply brakes to a wheelchair/bicycle* – *drive toy cars up and down ramps* – *operate battery toys and electrical appliances at fast and slow speeds.*	■ actively investigate how force acts on objects – *experiment actively with equipment that can be pushed/pulled/rolled/ bounced/squashed/blown* (see *Attending* and *Responding*) – *experiment with finding out what materials are easy/ difficult to push/pull/etc.* – *experiment with exerting different degrees of force in knocking down skittles/a tower of bricks (gently versus using a lot of force)* ■ know how to slow down a wheelchair/bicycle by pulling back or applying the brakes.

Attending	Responding	Initiating
Materials *The student should be enabled to* ■ become aware of the colour, shape, smell, and texture of a range of natural and manufactured materials in the immediate environment – *food, textiles, water, wood, plastic, metal* ■ attend to ways in which materials can be changed by twisting, bending, stretching, and squashing – *participate in and watch as experiments are carried out using materials such as paper, pipe-cleaners, play-dough, elastic, balloons, springs, fabrics* ■ participate in exploring the effects of water on materials – *become aware of the changes that occur in some materials when wet* – *feel the difference between wet and dry materials* – *observe that some materials float and some sink* ■ observe and experience the effects of heating and cooling on familiar objects – *water, ice-cream, butter, chocolate* ■ observe and experience the way food changes when cooked or baked – *food becoming warm and tasty* – *cakes or buns rising.*	**Materials** *The student should be enabled to* ■ reach out to explore properties of manufactured and natural materials with gradually decreasing guidance (see *Attending*.) ■ show preferences for certain materials ■ respond with interest when materials are seen to change through wetting (see *Attending*) – *experiment with materials that dissolve using cold or hot liquid (coffee powder/ sugar/jelly/custard powder)* ■ show interest in experimenting with the effects of heating and cooling familiar materials – *using a hairdryer to dry hair* – *applying heat to a block of ice/ice cream/butter/ chocolate* – *allowing jelly to set in the fridge* ■ respond with interest to the way in which food changes when cooked or baked – *make toast in a toaster* – *make popcorn in a microwave oven* – *bake fairy cakes in an oven.*	**Materials** *The student should be enabled to* ■ contrast and compare the properties of manufactured and natural materials (See *Attending*.) ■ communicate about and make choices between materials – *collect materials for a purpose or as a hobby,* – *choose materials for a collage* ■ explore the effects of water on a variety of materials – *wetting materials* – *dropping things in water to see if they float or sink* – *experimenting in dissolving materials* – *dissolving materials for a purpose* ■ show by expression, gestures, vocalisation, pictures, words, or actions that he/she understands the effects of heating and cooling familiar materials – *know that an ice-cream will melt if left near heat* – *know that chocolate can be melted in the microwave oven* – *take ice-cubes from the freezer to cool drinks,* – *watch as custard or jelly sets as it cools.*

Attending	Responding	Initiating
Materials	**Materials**	**Materials** ■ assist in cooking and baking food actively and safely – *mix ingredients correctly* – *anticipate the changes that will happen* – *communicate about those changes* ■ request by gesture, picture, sign, or vocalisation that a particular experiment be carried out or repeated.

Exemplars

Introduction to science exemplars

The following pages outline some ideas for developing themes and topics in science for students with severe and profound general learning disabilities.

Exemplar 1: **SESE: Science**

Topic: Wet and dry	**Strand:** Materials

Objectives

The student will

- experience the difference between wet and dry
- work co-operatively in pairs.

Resources

- A microwave oven, a hairdryer, paper, cloths, sand, rice (some uncooked and some cooked in advance in a microwave oven and allowed to cool).

Lesson

(The language of wet and dry is emphasised throughout.)

→ The students, working in pairs, observe and feel the dry version of each material. One student passes the material to the other, with help as necessary.

→ Each pair receives a jug of water and feels the water.

→ They pour the water on the material and feel the water.

→ They feel the wet version and contrast it with the dry version. (Various materials can be rotated between pairs of students.)

→ Wet and dry bowls of rice are then passed around for feeling and contrasting.

Development

■ Students experiment with drying things with the hairdryer.

Exemplar 2: **SESE: Science**

Topic: Hot and cold | **Strand:** Energy and forces

Objectives

The student will

- safely experience the difference between hot and cold
- indicate vocally or by facial expression a preference for hot or cold food/drinks.

Resources

- Hot and cold drinks, hot and cold food (prepared in advance using a microwave oven), hot and cold basins of water, a hairdryer.

Note: When teaching the differences between hot and cold great care should be taken to ensure that food and drinks are not too hot for students.

Lesson

→ Allow the students to explore and feel the difference between putting their hands in cold water and putting their hands in hot water, putting a lot of emphasis on the words hot and cold.

→ Give each student a cold drink, followed quickly by a hot drink, again with emphasis on the words hot and cold.

→ Give each student a spoonful of cold food, followed quickly by a spoonful of hot food, again emphasising the words hot and cold.

→ Use the hairdryer gently to allow the student to feel the contrast of hot air and cold air on his/her hands, face, etc.

Development

- Allow a choice between hot and cold food/drinks.
- Use pictorial symbols/hand-signs/words to indicate hot and cold.
- Observe how food is heated in the microwave oven, feeling it before and after.

Exemplar 3: **SESE: Science**

Topic: Making a miniature garden

Strand: Living things

Objectives

The student will

- experience the texture, smell and appearance of soil
- develop his/her awareness and enjoyment of plants in the immediate environment
- work with other students on a common project
- follow the progress of the garden using all the senses
- help in caring for the garden.

Some students will

- develop a sense of ownership of the garden.

Resources

- A bag of compost, small plants (all safe to eat and preferably having interesting smells or textures), grass seeds, a small amount of sand or stones, any decorations that might enhance the garden, a small patch of ground outdoors/a tub outdoors/a container for an indoor garden.

Lessons

→ A series of lessons is planned that involves the students in as many stages of the project as possible. If possible, students should visit a garden centre and help to choose plants and get compost. Alternatively, parents/guardians could be invited to send in plants for the garden. The teacher must make sure that all plants gathered are safe to touch, to smell, and to eat.

→ Plans for the garden could include having grassy areas and areas with plants, having paths of sand weaving through the garden, fencing off areas with lollipop sticks if indoors or small stakes if outdoors, and decorating the garden using clay ornaments made by the students. Parents/guardians may be delighted to offer ideas and assistance.

→ A number of lessons can be based on

- examining the soil and plants
- preparing the patch of ground/tub/container
- laying out a plan for the garden (helping to draw out a plan and deciding what to put where on the plan)
- planting the plants and grass seed if used
- creating little paths with sand or stones
- decorating the garden
- watering, trimming and watching plants grow
- having responsibility for minding the garden (Each student has a particular job, or gets to mind the garden for a designated day/week.)
- smelling plants and tasting plants where appropriate
- inviting staff members and students to see the garden
- showing off the garden to visitors/parents/guardians
- photographing or videoing the garden at various stages of development and keeping a visual record of progress
- creating a book about *Our garden*.

Exemplar 3: **SESE: Science**

Integration

- **Communication and language**—focusing and tracking, awareness of and interaction with objects in the immediate environment, words associated with plants and the garden, looking at a visual record of garden, following instructions.
- **Social, personal and health education**—co-operating and working together, awareness of change, developing a sense of ownership and responsibility.
- **Geography**—awareness of natural materials in the environment, sharing the environment with plants, caring for plants in the immediate and local environment.
- **Mathematics**—measuring the growth of plants, keeping a visual record of progress (Data).
- **History**—Taking photographs and creating a historical record of the sequence of preparing, making and growing the garden.