wexford educate together 

Science

Science

■ **Title: Wexford Educate Together National School**

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■ **Introductory Statement and Rationale**

(a) Introductory Statement:

We aim through this plan, drawn up in accordance with the Science curriculum, to set out our approach to the teaching and learning of Science. This plan will form the basis for teachers long and short term planning. It will also inform new and temporary teachers of the approaches and methodologies used in our school.

(b) Rationale:

a. To benefit teaching and learning in our school.
b. To conform to principles of learning outlined in the Primary School Curriculum.
c. To review the existing plan for Science.

■ **Vision and Aims**

Refer to Curriculum Guidelines. Wexford Educate Together upolds the Primary School Curriculum 1999 Aims and Objectives. Please see pg. 4 and 5 Science Curriculum 1999

(a) Vision:

(b) Aims:

■ **Content of Plan**

Curriculum:

1 Science Programme:

1.1 Strands and Strand Units:

Our school will follow the strands and strand units as sst out in the Science Curriculum pp20-92
We have broken down the strand units over a two year period, to ensure that each child will have access to all strand units over a two year cycle. This also reflects the spiral learning pattern of the revised curriculum, each year building on previous knowledge.

1.2 Children's Ideas:

WE try to use children's ideas as much as possible when introducing a topic. The following methodologies are employed:

- ***Brainstorming***
- ***Mind-mapping***
- ***Open ended questioning***
- ***Cartoon/Annotated Drawing***
- ***KWL (What you Know, Want to know, what you have Learned)***
- ***Talk and discussion***
- ***Teacher designed tests and tasks***

1.3 Practical Investigations:

Practical Inverstigation are used regularly in the teaching of Science. The school has built up a range of resources for each strand unit. Each resource box contains the relevant resources to facilitate practical investigation in the classroom, thus ensuring that children can apply scientific concepts to everyday situations. Teachers vary their approach to investigation with a combination of open and closed activities (See TG p.54). The teacher will use questions during and after investigations to ensure children are considering fair testing in their investigations.

1.4 Classroom Management:

When demonstrating skills we take a teacher-directed approach however, the children are encouraged to work on their own problems as far as possible. Group work is varied within the classroom and we use the following groupings :

- Whole Group
- Small group (small group rotating)
- Pairs
- Individual

This ensures that the children have the oppportunity to work collaboratively with their peers. Children are also encourage to present the findings of their investigations to their and other classes. The following approaches are used:

- Oral presentation to the class
- Pictorial representation
- Peer Assessment (scoring rubric, three stars and a wish)
- Discussion
- Written Reports

1.5 Key Methodologies:

A whole school planning approach is adopted by the school which ensures that all the key methodologis (See Tg pp.52-145) are used in our teaching. These include:

- Using the environment
- Active Learning
- Guided and Discovery Learning
- Free Exploration of Materials
- Spiral Nature of the Curriculum

- Learning through Language.

As part of our school policy on Special Needs and our commitment to the idea of Multiple Intelligences, teachers differentiate and according to ability and learning styles.

1.6 Linkage and Integration:

Science lends itself well to linkage and integration.
We see the folllowing opportunities for linkage and integration:
Living Things:

- Myself (S.P.H.E , History, English, Drama, Visual Arts, Music, Gailge, R.E)
- Plants and Animals (S.P.H.E., History, English, Geography, Drama, Visual Arts, Music, R.E.)

Energy and Forces:

- Light (History, Geograpy, English)
- Sound (Music, History, Geography, English, Visual Arts)
- Heat (Geography, History, English)
- Magnetism and Electricity (Viaul Arts, History, Geography, English, Maths)
- Forces (Maths, Geography, Visual Arts)

Materials

- Properties and Characteristics of Materials (Visual Arts, Maths, English, Geography)
- Material and Change (as above)

Environmental Awareness and Care (History, Geography, R.E., English, Maths, Visual Arts, S.P.H.E.)

Science is also used as an opportunity to develop confidence and competence in language through the use of:

- Oral Presentations
- Written Descriptions and Reports
- Discussion

Scientific vocabulary is also enhanced by the use of such methodologies.

1.7 Using the Environment:

The features of the local environment which we draw upon as a resouce for Science lessons are:

- The school grounds
- Habitats: The Hedgerow, The Beach (sand-dunes), Ponds.

Habitats and Amenities within the school grounds include trees, variety of species and maturity; variety of wildflowers and green area; birds; insect life, school garden. Current and future staff members are to be made aware of these through a walking tour of the grounds, access to school plan which includes list of habitats and amenities. Any new additions to the environment, for example a pond, will be distributed amongst staff members. At the moment all staff are responsible for distributing such information but when a post for this curricular area arises in the school, the person with this Special Duties post will be responsible for this.

The habitats/amenities can be used across the four levels in working towards the content

objecdtives in the following ways:
-develop an interst and curiosity about the world through the exploration and study of living and non-living things.
-develop a knowledge and understanding of scientific ideas through the study of living things and environments in which they live.
-observe, ask questions, discern pattens, hypothesise, plan, experiment, design, make, measure, discuss, analyse and evaluate results and so develop a scientific approach to problem solving.
-understand the intedependence 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 sustainable development of the planet.
At the moment, the school is in rented premises and we cannot make any changes to the immediate environment. We do have a school garden at the moment with a variety of herbs, flowers and vegetables.
Children are given the opportunity to engage with their immediate natural environment through nature walks, field trips and studies of various flora and fauna. This is carried out seasonally so that children can observe changes as they occur. Pupils can observe the wider global environemnt through studies undertaken on various habitats in other parts of the world. This is facilitated by use of the internet, resource books, presentations, school field trips and though teacher led discussion as well as independent research and projects in senior classes.
Utilising Local Expertise: The school has made links with local organisations which deal with science and nature studies. A list has been compiled of these amenities and contact details of experts in these areas are available on this list. Teachers can organise for visitors to come to the school following a consultation process with the visitor in order to determine the suitability and relevance of information/visit. Teachers must be aware of schoo policies that apply when visitors are on school premises. These include:

- Child Protection Policy
  -Class teacher must be present at all times
  -No pupil is to be left alone with visitor
  -Photographs are only to be taken on school camera
- Health and Safety
  -Teacher is to observe best practise and ensure that all activities are carried out in a safe manner.
- Positive Language Policy
  -Visitor is to made aware of Positive Language Policy which is in practice in school.

Class Trips:
At beginning of the school year parents are requested to sign a form giving permision for the teacher to take children on spontaneous trips in close proximity to the school. Trips which are further away require permission slips to be distributed. The Principal is to be informed of any school trips and permission must be granted prior to permission slips being distributed. In the case where a parent has not given permission for their child to attend the trip, that child will be supervised in the school by another staff member.

Schemes to foster environmental awareness:
The school participates in the Green Schools Project and The Heritage Council Artists' Initiative. Each classroom actively participates in recycling of materials and staff actively encourage children to recycle at home and inform parents of recycling activities.

1.8 Balance between Knowledge and Skills:

INFANTS:
(Teachers are referred to Curriculum pp.20-21)

Questioning:

- *Ask questions about animals, plants, familiar objects and events in the immediate environment.*
- *Use both open and closed questions.*

Observing:

- *Use the senses to observe animals, plants, objects and events in the immediate environment.*
- *Observe characteristics such as the shape, size, colour, pattern, texture, sound and smell of familiar things in the local environment.*
- *Observe differences and similarities.*

Predicting:

- *Guess and suggest what will happen next in structured situations.*

Investigating anf Experimenting:

- *Carry out simple investigations set by the teacher, make observations and collect data.*

Estimating and Measuring:

- *Describe mass and length using non standard units and informal language*
- *Compare and estimate*
- *Match objects of equal length*

Analysing:

- *Sort and group objects according to observable features*

Recording and Communicating:

- *Describe his/her observations orally using an increasing vocabulary.*
- *Represent findings pictorially and in other media.*

FIRST AND SECOND:
PP.36-38

Questioning:

- *Ask questions about animals, plants, familiar objects and events in the immediate environment.*
- *Use both open and closed questions.*
- *Ask questions that may lead to investigations.*

Observing:

- *Use the senses to observe animals, plants, objects and events in the immediate environment.*
- *Observe characteristics such as the shape, size, colour, pattern, texture, sound and smell of familiar things in the local environment.*
- *Observe gradual changes in living thins and familiar objects and events over a period.*

Predicting:

- *Guess and suggest what will happen next in structured situations.*

Investigating anf Experimenting:

- *Carry out simple investigations set by the teacher, make observations and collect data.*
- *Begin to suggest approached and methods of solving problems.*
- *Begin to identify one or two variables with guidance from the teacher.*

Estimating and Measuring:

- *Begin to use simple methods to estimate, measure and compare observations.*
- *Compare and identify differences in measurements*
- *Appreciate the need for standard units.*

Analysing:

Sorting and Classifying

- *Sort and group objects according to observable features*
- *Appreciate that there are different criteria for sorting and suggest more than one way of sorting a number of items.*

Recognising Patterns

- *Begin to look for and recognise patterns and relationships in observations.*

Interpreting:

- *Draw conclusions from simple investigations.*

Recording and Communicating:

- *Describe and discuss observations orally using an increasing vocabulary.*
- *Represent findings using pictures, models and other methods.*

THIRD AND FOURTH

Questioning:

- *Ask questions about animals, plants, familiar objects and events in the immediate environment and their relationship.*
- *Use both open and closed questions.*
- *Ask questions that will identify problems to be solved.*
- *Ask questions that will help in drawing conclusions and interpreting information.*

Observing:

- *Observe and describe natural and human elements and processes in the immediate environment.*
- *Observe characteristics such as the shape, size, colour, pattern, texture and the interrelationship of elements in the local environment.*

Predicting:

- *Offer suggestions(hypotheses) based on observations about the likely results of the investigation.*

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Investigating anf Experimenting:

- Collect information and data from a variety of surces, including observations in the environment, classroom observations and experiements, photographs, books, maps and informatioon and communication technologies.
- Design, plan and carry out simple ivestigations.
- Identify one or two obvious variables relevant to the investigation.
- Realise that an experiement is unfair if relevant variables are not controlled.

Estimnating and Measuring:

- Measure, compare and record mass, weight, capacity, time and temperature using appropriate standard units of measurement andsimple equipment.

Analysing:

Sorting and Classifying

- Sort and group data on people, events and natural phenomena using a range of appropriate criteria.
- Sort and present data in sets and subsets.

Recognising Patterns:

- Look for and recognise relationships when making observations.
- Select appropriate observations that fit a pattern.

Interpreting:

- Interpret information and offer explanations.
- Draw conclusions from suitable aspects of the evidence collected.

Recording and Community

- Record and present findings and conclusions using a variety of methods.

FIFTH AND SIXTH

Questioning:

- Ask questions about animals, plants, objects and events in the immediate environment and their relationships.
- Ask questions that will identify problems to be solved.
- Ask questions that will help in drawing conclusions and interpreting information.

Observing:

- Observe, describe and discuss physical, natural and human elements and processes in the immediate environment.
- Recognise and describe pattern and sequences in observations.
- Distinguish between the significant and less significant observations.

Predicting:

- Offer suggestions (hypothesis) based on a number of observations and data available about the likely results of the investigations.

- Make inferences based on suggestions and observations.
- Propose ideas or simple theories that may be tested by experimentation.

Investigating and Experimenting:

- Collect information and data from a variety of sources.
- Design, plan and carry out simple experiements, having regard to one or two variables and their control and the need to sequence tasks and tests.
- Realise that an experiment is unfair if relevant variables are not controlled.

- Appreciate the importance of repeating tests and experiments.
- Identify (with guidance) different ways of looking at a problem and compare results of different investigations.

Estimating and Measuring:

- Use appropriate simple instruments and techniques to collect and record data on length, weight, mass, capacity, time and temperature.
- Estimate and use appropriate standard units of measurment.
- Decide what should be measured and the degree of accuracy required.

Analysing:

Sorting and Classifying

- Sort and group data on people, events, natural phenomena, materials and physical processes using a range of appropriate criteria.
- Sort and present data in sets and sub sets.

Recognising Patterns:

- Look for and recognise patterns and relationships when making observations.
- Identify other instances that fit an observed pattern.
- Use observed patterns to make predictions.

Interpreting

- Interpret informaiton and offer explanations.
- Draw conclusions from suitable aspects of the evidence collected.

Recording and Communicating

- Record and present finding and conclusions using a variety of methods.

Evaluating

- Review the methods used in investigations and assess their usefulness.

2 Assessment – Looking at Childrens' Work:

The children are given the opportunity to record their work in a variety of ways. For example, oral presentaions, written reports, pictorially, concept maps, photographs.
The following assessment tools are used by the class teachers to assess knowledge, understanding and scientific skills:

- Teacher designed tests and tasks
- Observations
- Work samples

- S.E.S.E. folders

We also give the children the opportunity to self assess and peer assess. This is carried out by using class discussion, scoring rubric, and other constructive methods such as three stars and a wish.

The children are assessed using a rating scale. This score is communicated to parents in our annual reports and in parent-teacher meetings. The rating scale is as follows:

1= Experiencing significant difficulties
2= Experiencing some difficulty
3=Managing comfortably
4=Capable adnn competent
5=Highly capable and competent

Assessment of science is ongoing throughout the year. Collaboration between staf members and subject meetings at the beginninng of the academic year allow teachers to gather and share information on assessment in the area of science.

3 Children with Different Needs:

Our whole school approach allows us to meet the needs of all pupils in our school community. We cater for the range of learning abilities using a varied approach to the mthodologies we employ. For children with specific and general learning disabilities team –teaching between class teachers and Resource/Learning Support teachers is often used.

Children of exceptional ability are encouraged to develop their learning further by completing additional research projects as well as extra problem solving activities in the classroom setting. Any children with exceptional ineterst/ability will be informed of any competitions, projects, events , programmes, organisations (Centre for Talented Youth) nationally.

4 Equality of Participation and Access:

Educate Together schools are commited to being Co-Educational. It is one of the four main aspects of our ethos. (Co-Educational, Multi-Denominational, Democratically Run, Child-Centred). We work to ensure all children are empowered to fulfil their potential irrespective of gender, culture, ablity, socio-economic background.
The school has made a conscious effort to ensure that the wider school environment is accessible to all our students.
Parents and teachers worked collaboratively on the development of our RSE programme in the school. Parents have the opprtunity to view the programme being taught in the school. If a parent wishes, they may withdraw their child from the RSE programme and alternative supervision arrangements will be made.

Organisation:

5 Timetable:

In accordance with the suggested time framework as Primary School Curriculum Introduction pg. 70 Science is to be taught separately for one hour per week and forty-five minutes per week in Infant Classes. It is at the descretion of the class

teacher how the lessons are to be divided. Occasionally lessons may be integrated with other areas of SESE as advised in the Curriculum. Cross-curricular links are to be mde explicit where possible and thematic planning is advised. From time to time individual classes may organise presentations/project show and tell either to their peers or to parents. Each teacher will receive a copy of the whole school timetable and lists of resources available prior to the commencement of the first term. It is the onus of the teacher to devise a class timetable which suits the needs of both teacher and children, using this framework and to submit such to the Principal. This will enable best practice in sharing of resources. Teachers will liaise closely with Resource Teachers and inform them of topics being covered in the area of Science in order to maximise learning opportunities.

6 Resources and Equipment:

A list of suitable resources has been compiled divided into each Strand and Strand Unit. It will be stored in the office with our Science resources. Teaching aids are stored in transparent boxes centrally according to topic. Each box contains a list of the contents within as well as some practical teaching ideas/guidelines including worksheets, DVDs, CDs, booklets and resouce books/packs. We are currently sourcing resources to suit each class level and it is up to each staff member to update the list of resources as they are being collected.

Teachers can use these resources to enhance their teaching and the learning experience of the pupils. Pupils can engage with materials and resources through investigation, project work, discussion, exploration, group/individual work, teacher led tasks. The use of ICT as a teaching tool and as a means for research is encouraged in the school. A list of suitable websites is available for each staff member. Pupils may also engage in research using the Internet as a resouce. Wexford Educate Together Acceptable Usage Policy applies here and students must be supervised at all times.

Teaxtbooks and workcards are used during science lessons to support active investigative work. These resources are discussed and regularly updated by staff. A range of secondary resources is available in the office. These help to support children as they work scientifically and as they undertake designing and making tasks. Children do not have a textbook for Science as it is felt that active learning should be used as much as possible in the teaching and learning of science.

7 Safety:

Staff members are familiar with Health and Safety Policy and all classroom activities are planned in accordance with this. Teachers are made aware aware of the safety implications of any exploratory and invesigative work to be undertaken. Primary science activities should not involve the use of chemicals or other hazardous materials. Safety should permeate all aspects of teaching of science, and children should be encouraged to observe safety procedures during all tasks. Staff are reminded of precautions to be taken during the teaching of science at staff meetings.

Outdoor Exploration and Investigation: Outdoor work should be based in areas that are accessible for children, teachers and helpers and that are safe. Preliminary visits by teachers to the site can be used to identify potential hazards. If there are apparent dangers then a more suitable habitat should be selected for study. Habitat studies involve children working with plants and animals, and teachers should be aware that children may be allergic to some animals and plants. At the beginning of the school year parents must notify the school of any allergies that their child has. A list of these children with allergies is available in the office. Teachers also have this list.

Adequate supervision should be given to the children at all times. As most outdoor investigations will involve children workin in small groups, it will be necessary for a

number of adults to accompany each class. These adults should be aware of the hazards that may be enccountered and the procedures to be adopted in the event of emergencies.

Light: When planning a unit on light the teacher will ensure that the children are aware of and adhere to the following dafety procedures:

- Children should not look at the sun or at very bright beams of light such as projector beams.
- Plastic mirrors should be used for investigation and children should avoid using glass mirrors.
- Pupils should never look at the sun through lenses
- Children should be made aware of the dangers of sunburn

Electricity: Children should be aware of the following safety considerations:

- the dangers of touching the bare metal of a plug/switch especially when hands are wet
- the importance of not using electrical appliances without adult supervision
- the dangers associated with flying kites or using fishing rods near overhead wires
- the risks attached to playing near electricity substations
- when using batteries in the classroom the teacher must be aware of the necessary safety precautions to be followed.

Magnets: Magnets need to be stored carefully to preserve their magnetism. They should be stored with their keepers.

Forces: Care should be taken during work on forces because of the risk of injury resulting form moving objects.

Heat: The teacher should be very careful in the organistaion of activies involving hot water. The children should use water that is safe for them.

8 Homework:

Homework is assiged to pupils as per our Homework Policy. Most scientific investigation will be conducted in class but from time to time children may be given practical or written tasks to complete at home. This supports the development of home-school links.

9 Individual Teachers' Planning and Reporting:

Teachers are required to refer to the school plan for Science prior to commencement of the school year. This will inform their planning and alert them to resources available for each Strand. Each teacher is required to engage in long and short term planning. This is done using the Curriculum books. The whole school plan/timetable is adopted by all teachers and reviewed regularly at staff meetings. Teachers compare and contrast Cuntas Miosuil with their long term plans to assess progress and identify key areas of development for the following class teacher to focus on.

10 Staff Development:

Teachers share knowledge and skills within the school. Team teaching may be employed to facilitate large class trips, experiments and sharing of resources and

equipment. If a teacher needs to be supported in the area of science, arrangements can be made to offer a mentoring service whereby the teacher is advised as to best practice in planning, teaching methodologies and assessment.
Teachers are notified of any courses available in the area of science. Teachers share their experiences and resources acquired from these courses with other staff members during planning days and staff meetings. If the staff and Principal feel the need to seek outside professsional support in the area of science they can contact the Primary Professional Development Service to arranage training and support.
At the moment there is no Special Duties post available with responsibiliy for science.Thus, it is the teachers responsibility to monitor developments and co-ordinate resources.

11 Parental Involvement:

Parents are made aware that they can access the Curriculum in various ways. It is also available on our school website. General Information evenings are held at the school where parents have the opportunity to meet Principal and class teachers. Parents are encouraged to take an active role in their child's learning in the area of science. As outlined above in point number 8 practical and written tasks may be carried out at home. Children are also encouraged to disuss experimetns and projects taking place in the classroom at home. Parents are also invited to participate in class trips, projects and dipslays in the school. Parents are also asked to list their skills and areas of expertise and teachers can access this information to assist in planning for learning in the classroom.

12 Community Links

School will endeavour as much a possible to make links with the local community. This can be done in the following ways:

- Class trips to local places of interest
- Visitors to the school to share their knowledge and expertise
- Liaising with local state bodies, for example the Heritage Council and Local Authorities
- Open days where projects carried out in the school can be exhibited and shown to the wider community.
- Liaising with local media to raise the profile of science as a living subject

■ Success Criteria

Implementation of plan. Teachers yearly/monthly and weekly preparation - Cúntas Míosúil will indicate to what extent the plan has been followed. Informal assessment & teacher observation is on an ongoing basis. Indicator of achievement of aims – feedback from teachers & pupils & parents; whole school evaluations. Standardised testings indicate mastery of concepts.

■ Implementation

(a) Roles and Responsibilities:

The plan is supported, developed and implemented by class teacher(s), learning support teachers, resource teacher and ultimately by the Principal who co-ordinates, assesses and evaluates progress of plan and reports back to staff.

(b) Timeframe:

The plan is in operation now. Formal implementation took place in 2009/2010.

■ Review

(a) Roles and Responsibilities:

Involved in the review will be:
The Principal (plan coordinator)
Teachers
Post holders
For future consideration - pupils and parents

(b) Timeframe:

Every two years

■ Ratification and Communication

Ratified by the Board of Management. Staff Representative will present in accordance with the School Policy.