



Primary School
Curriculum



Geography

Social, Environmental and
Scientific Education

Teacher Guidelines



DUBLIN
PUBLISHED BY THE STATIONERY OFFICE

To be purchased directly from the
GOVERNMENT PUBLICATIONS SALE OFFICE
SUN ALLIANCE HOUSE
MOLESWORTH STREET
DUBLIN 2

or by mail order from
GOVERNMENT PUBLICATIONS
POSTAL TRADE SECTION
4-5 HARCOURT ROAD
DUBLIN 2
(Tel: 01-6476834-5; Fax: 01-4752760)
or through any bookseller

Design Consultancy:	Bradley McGurk Partnership
Designed by:	The Identity Business
Photography:	Christy McNamara
Typesetting:	Spectrum Print Management
Printed by:	Mozzon Giuntina - Florence and Officine Grafiche De Agostini - Novara



Geography

**Social, Environmental and
Scientific Education**

Teacher Guidelines

Contents

Section 1

Geography in the primary curriculum

The nature of geography 2

Geography in a child-centred curriculum 4

Section 2

The content of the geography curriculum

Basic structure and terminology 8

Strands of the curriculum 8

Skills and concepts development 18

Section 3

School planning for geography

Curriculum planning 26

Organisational planning 33

Section 4

Classroom planning for geography

Planning issues for the teacher 42

Some planning exemplars 48

Section 5

Approaches and methodologies

A variety of approaches	62
Learning about places: a framework	64
Learning about the local environment	68
<i>Exploring and investigating in the local environment</i>	68
<i>Preparing for work in the environment</i>	69
<i>Investigating human environments</i>	81
<i>Investigating natural environments</i>	97
Learning about other places	116
Maps and mapping	127
<i>Map work for infant to second classes</i>	128
<i>Map work for third to sixth classes</i>	134
Atlases, globes and map projections	145
Using information and communication technologies	155
Looking at children's work	157

Section 6

Appendix

Useful maps and books	164
Source references for the curriculum and guidelines	173
Glossary	176
Membership of the Curriculum Committee for SESE	184
Membership of the Primary Co-ordinating Committee	185
Acknowledgements	186



Section 1

Geography in the primary curriculum

Geography in the primary curriculum

Geography is the study of the Earth, its inhabitants, and the inter-relationships between them in the context of place, space and environment.

Geography may be said to be concerned with three major themes: place, space and environment.

The nature of geography

Defining geography

From earliest times people have sought to explore, describe and understand the world in which they live. This quest is at the heart of geography and is reflected in the origins of the subject's name in the Greek words *ge* (the earth) and *grapho* (I write).

Geography is the study of the Earth, its inhabitants and the inter-relationships between them in the context of place, space and environment. It seeks to describe and explain the natural and human features found in the numerous environments on the Earth, it celebrates the rich diversity of peoples living in these places and it explores the social, economic and cultural activities in which they engage. A major concern of all geographical studies is the inter-relationship of natural and human features and the lives of people, the relationship of humanity to environments at a variety of levels from the local to the global.

Geography draws upon a wide range of other disciplines and it encompasses a very broad field of knowledge and investigation. Aspects of the physical sciences such as geology, chemistry and biology and of the social sciences such as history, economics and sociology complement and enrich the geographer's attempts to describe and understand the world. Geography also relies upon mathematical and other skills. This

diversity of perspectives is one of the key attributes of the subject.

Geography brings its own unique perspective to bear on the study of environments and peoples. It may be said to be concerned with three major themes: place, space and environment. It also offers us a distinctive set of skills and tools with which to explore and document the world, particularly those associated with mapping and other forms of graphicacy.

Place, space and environment

Place

Geography is concerned with the nature of places and geographers explore and describe the peoples and features (natural and human) which give places their distinctive character. The character of a place is defined by the people and communities who live there, their interactions and lifestyles, the features that they construct, the elements of the natural environment and the inter-relationships between all of these aspects. Geography reveals these characteristics to us and seeks to explain how they may have come about and how or why they may be changing.

An understanding of these essential characteristics enables us to recognise the similarities and differences between places, to appreciate the unique identity of places well known to us and to imagine what it might be like to live in other places beyond our direct experience.

Space

Geography is also concerned with concepts of space and place. The study of spatial patterns involves exploring how natural and human features are distributed on the Earth and how and why they relate to each other. Some of these relationships, such as those between mountains, rivers and seas, are readily observed. Other spatial patterns, such as the relationships between places and patterns of human activities which are found there, may be less obvious but equally important to our understanding of the world in which we live.

Environment

Geography has always been concerned with the inter-relationship of humans and the Earth. At first, geographers tended to concentrate on explaining how physical and natural environments determined aspects of the lives of people, for example how climate influenced homes and clothing. They also examined the ways in which humans used the Earth's resources.

Subsequently, geographers have become increasingly concerned with the effect of human activity on the Earth. They were among the first to alert us to the potentially serious impact of our actions on the environment, not only in natural environments but in towns and other built environments and in local, regional and global contexts. The interdependence of peoples and their environments is a major theme of geography.

Consequently, geography is concerned with fostering an informed appreciation of environments, a sense of personal and community responsibility for environmental care and the notion of people as custodians of the Earth for future generations.

Geographical skills

Geography also incorporates a distinctive set of skills which allow us to explore and understand the Earth's environments.

An important characteristic of geographical work is that a great deal of it takes place outside. *Fieldwork*, in which scientific investigative methods are applied to features and processes in the environment, is an essential aspect of geography. Geographers observe, measure and collect data, make predictions, test hypotheses and draw conclusions about the places, events and phenomena which they see.

However, one of the most distinctive geographical skills involves the representation of spatial, locational and other geographical information in plans, maps, models and other forms of graphical presentation. Traditionally, this aspect of geography was referred to as mapping, but it encompasses much more than the use of maps.

Geographical information may be presented in several forms such as models, graphs, photographs, satellite and remotely sensed images and charts. It may also be presented through electronic means. *Graphicacy* refers to the recording and communication of information using techniques that do not rely primarily on verbal or numerical means.

Geography in a child-centred curriculum

An activity-based and broadly balanced geography curriculum that reflects the diversity of the subject outlined above can make an important contribution to the education of the child because it helps to answer some of his/her real needs. The *Introduction, Aims and Broad objectives* for geography outlined in the curriculum provide more specific detail on the nature of the subject and on its contribution to the child's development in the primary school.

Among its most important contributions to the education of the child, geography

- answers the child's need to explore and understand the world around him/her
- equips the child with a range of skills and concepts enabling him/her to explore and record natural and human features and interactions in local and wider contexts in a systematic way
- helps the child to develop a sense of his/her own place and thus contributes to the child's self-identity
- fosters the child's sense of local, regional, national, European and global citizenship

- develops an empathy with others and an appreciation of peoples from a diversity of cultural, ethnic, social and religious backgrounds
- develops a sense of individual and community responsibility for environments.

It should also be noted that these aspirations cannot be achieved in isolation. Geography should be viewed as having a distinct but complementary role together with history and science within SESE in contributing to the wider child-centred curriculum. Because it involves the study of people and their actions in local and wider communities geography provides an important basis for the development of the child's sense of community membership and citizenship. Social, personal and health education (SPHE) and geography will play a close and complementary role in this aspect of the child's development.

The content of the geography curriculum

The content of the geography curriculum

The strand units outline the knowledge to be acquired by pupils and they provide the context within which children develop geographical skills and concepts.

Basic structure and terminology

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

- a skills and concepts section which delineates:

A sense of place and space

Maps, globes and other graphical skills

Geographical investigation skills

- a number of strands which outline the subject matter which may be included in the geography programme:

Human environments

Natural environments

Environmental awareness and care.

Each strand includes several strand units which will form the basic sections of the content covered.

Strands of the curriculum

Presentation of content

The topics to be explored in geography are presented in the strands of the curriculum. The strand units outline the knowledge to be acquired by pupils and they provide the context within which children will develop geographical skills and concepts.

How are the strands arranged?

The strands have been chosen to help ensure that the child experiences a broadly based geography programme. The strands, which remain the same at all levels in the curriculum, reflect three major areas of geographical investigation:

- human geography (*Human environments*)
- physical geography (*Natural environments*)
- environmental issues (*Environmental awareness and care*).

The units within each strand have been designed to provide flexibility for schools and teachers in the planning of geography, while at the same time ensuring that children experience a wide range of geographical topics.

The range of features, processes and environments to be explored and the depth of treatment expected in each strand grows from level to level in the school. This development is reflected in the increasing differentiation of strand

Where is my local area?

The extent of the local area which might be studied grows as the child becomes older.

- for infants:
the home, school and their immediate surroundings
- for first and second classes:
the home, school, places within walking distance of the school
- for third and fourth classes:
the area in which most of the children's homes are located, places where children shop and play
- for fifth and sixth classes:
a large urban area, part of a larger urban or suburban area, or a county

units for children as they progress within the school (compare, for example, the titles of strand units for infant classes with those for fifth and sixth classes) and it may also be seen in the growing sophistication of the geographical themes outlined in the units for the middle and senior classes (see table overleaf).

Within the strand units, it is not expected that children should complete each objective or suggested activity; *rather teachers and schools will select from the content objectives and exemplars outlined.*

The contexts for geographical study

A further feature of the organisation of the strands and strand units is the growing range of contexts which children will explore. It is an important principle of the geography curriculum (and of the other SESE curricula) that concepts, knowledge and skills should be thoroughly explored in local contexts at all levels, with extension to regional, national and international contexts.

The extent of the locality with which the child will become familiar will increase as the child grows older. For children in infant classes and first and second classes the local area around the school and, if possible, the children's homes will provide the context for much geographical work. In the middle classes the locality will probably include the area in which most of the children's homes are located and the areas in

which they might shop and play. Senior classes might study a large urban or suburban area, or a county.

This emphasis on local studies will be complemented by the use of topics with a national or international dimension. In infant classes and in first and second classes units such as 'Homes' which will concentrate on the features of the children's dwelling places can be enriched by comparisons with homes in other areas in Ireland and abroad. Studies of the foods and clothes we use, places visited on holidays and news from relatives living in other places will also help to develop the child's awareness of peoples and environments beyond the locality. The programme for middle and senior classes provides for a more systematic treatment of wider environments including those in Irish, European and non-European contexts.

Although the division of the curriculum into three strands provides a convenient format in which geographical content may be presented, it should be noted that the strands are not discrete sections. Few physical features or landscapes are entirely free of human interference and within human or built environments many natural processes may be observed. Many of the objectives outlined in the third strand, *Environmental awareness and care*, will arise naturally as children study and learn about topics in the other two strands, *Human environments* and *Natural environments*.

	Infant classes	First and second classes
<i>Human environments</i>	<ul style="list-style-type: none"> • Living in the local community • People and places in other areas 	<ul style="list-style-type: none"> • Living in the local community • People and places in other areas
<i>Natural environments</i>	<ul style="list-style-type: none"> • The local natural environment • Weather • Planet Earth in space 	<ul style="list-style-type: none"> • The local natural environment • Weather • Planet Earth in space
<i>Environmental awareness and care</i>	<ul style="list-style-type: none"> • Caring for my locality 	<ul style="list-style-type: none"> • Caring for my locality
	Third and fourth classes	Fifth and sixth classes
<i>Human environments</i>	<ul style="list-style-type: none"> • People living and working in the local area • People living and working in a contrasting part of Ireland • People and other lands • County, regional and national centres 	<ul style="list-style-type: none"> • People living and working in the local area • People living and working in a contrasting part of Ireland • People and other lands • County, regional and national centres • Trade and development issues
<i>Natural environments</i>	<ul style="list-style-type: none"> • The local natural environment • Land, rivers and seas of my county • Rocks and soils • Weather, climate and atmosphere • Planet Earth in space 	<ul style="list-style-type: none"> • The local natural environment • Land, rivers and seas of Ireland • Physical features of Europe and the world • Rocks and soils • Weather, climate and atmosphere • Planet Earth in space
<i>Environmental awareness and care</i>	<ul style="list-style-type: none"> • Environmental awareness • Caring for the environment 	<ul style="list-style-type: none"> • Environmental awareness • Caring for the environment

Human environments

This strand is concerned with the peoples who live in different environments, their activities and the environmental features which they have created. Major themes within this strand include:

- peoples and communities, their lifestyles, social patterns and cultures, their inter-relationships and interdependences
- the inter-relationships of people and the natural environment
- the places in which people live: the homes, buildings and other features which people erect in the environment, either in single locations or in settlements such as villages or towns
- the way of life of people and their economic activities
- the links people and places have with other areas: the journeys people make from place to place and the way people communicate with each other.

For younger children

In infant classes and in first and second classes, children will become increasingly aware of themselves as members of the family and of the school and local community. The home, school and other familiar places will provide a variety of opportunities for investigation and learning. Features may be recognised and described; materials used in construction collected and investigated; and the relationship of buildings to the streets, roads, hills, trees or other elements of the landscape noted. The discussion of journeys in the area and beyond will help the child's growing locational awareness. The work of a range of people in the locality and their places of work may be discussed. Stories about local characters and those from other parts of Ireland and beyond will encourage comparisons. These should include examples where the inter-relationships and interdependences of people can be seen, for example the farmer who grows food for us or the postal workers who help us to communicate with distant relatives.

Themes in the study of human environments

- people and communities
- inter-relationships of people and the natural environment
- settlement
- economic activities: people at work
- transport and communications

For older children

In third and fourth classes and in fifth and sixth classes the curriculum provides for a more systematic study of the themes of human geography in a number of contexts.

Strand units

People living and working in the local area

People living and working in a contrasting part of Ireland

People and other lands

Contexts

- a local environment

- a contrasting environment in Ireland

- a European context
and
• a non-European context

By studying people and places in these four contexts, children will have opportunities to explore a number of common themes in a range of contrasting circumstances. This has the advantage of allowing a comprehensive treatment of the themes while offering considerable flexibility to schools and teachers.

Moreover, while the themes remain common in all of the places studied, useful contrasts and similarities may be identified by the pupils. Many differences between Ireland and other countries will be obvious but it is just as important to emphasise similarities such as common problems and the shared experiences of people in various parts of the world.

The unit 'People and other lands' in third and fourth classes and fifth and sixth classes reflects this. Many of the aspects of people's lives that are suggested in the content can be taught as themes with local, national and international dimensions. For example, a topic such as 'Foods and farming' might include work on food supply in the locality, in Ireland and in a number of contrasting areas throughout the world. One of the most important aims of these explorations, and of those on development issues that are included in fifth and sixth classes, should be the fostering of a sense of shared global citizenship and an understanding and appreciation of human diversity and interdependence.

Many features of the natural environment may be readily explored in rural areas but the opportunities provided by an open space in an estate or a section of the local park in urban areas should not be overlooked. The emphasis should be on helping the child to explore the area thoroughly and to identify and refine his/her concept of simple physical features: in rural areas, children might recognise the hill or forest visible from the yard of the school; a park or piece of waste ground in an urban area might contain examples of streams, ponds, rocks and boulders; children living near the sea should be able to visit, recognise and draw the beach, rocks or a cliff.

A further aspect of the strand *Human environments* is that children should become familiar with some of the features of the urban centres in their county and region, in some of the major cities of Ireland and the principal cities of the European Union. This work is outlined in the unit 'County, regional and national centres.' *However, it should be noted that mere rote memorisation of the names of cities, towns and countries does not enhance children's geographical understanding.*

Natural environments: physical geography

The range of physical geography

This strand provides for the study of landscapes and aspects of environments which have been formed by natural processes.

Broadly speaking, content in this strand introduces children to three areas of learning:

- the study of natural landscape features such as hills, mountains, rivers, headlands, beaches, forests, peatlands, etc. (a study usually referred to as geomorphology)
- the study of weather and climate (meteorology)
- the study of the Earth's relationship to other bodies in the solar system and space (astronomy).

Landscape

The natural landscape features which occur in an area (i.e. its topography) are crucial elements in forming the character of a place. Geography should enable the child to explore and recognise these features in his/her locality and in other locations with an increasing confidence and accuracy, to understand how some of these features have occurred and to appreciate how they may change over time.



The curriculum lays considerable emphasis on the exploration of limited areas and small-scale features in the early years. As the child grows older, the range of areas and their extent will increase and as more and more instances of a feature are encountered the child's concept of it will be refined.

In the infant classes, and in first and second classes, explorations and investigations in the local area will enable children to become familiar with common elements of the environment. The children should come to differentiate features such as slopes and flat places; water in puddles, ponds or rivers; materials such as wood, stones, sand and mud; and habitats such as trees, wild grass, hedgerows, river banks or seashore. In all of these areas opportunities will exist for the collection, sorting and naming of a range of natural materials, and children can also be introduced to the flora and fauna of the area through complementary studies in science. This work will involve considerable language development as the child names different features and items, classifies them and describes his/her observations and experiences.

In third and fourth classes, children should become familiar with some of the main natural features in a range of contexts, ideally the same areas as those used in the exploration of human environments. Through exploring the landscape and examining simple large-scale maps and photographs children

should begin to describe how some of the features are related to each other. For example, children might tell about or draw the forest near the lake, the stream flowing down the hill, or the beach at the bottom of the rocks.

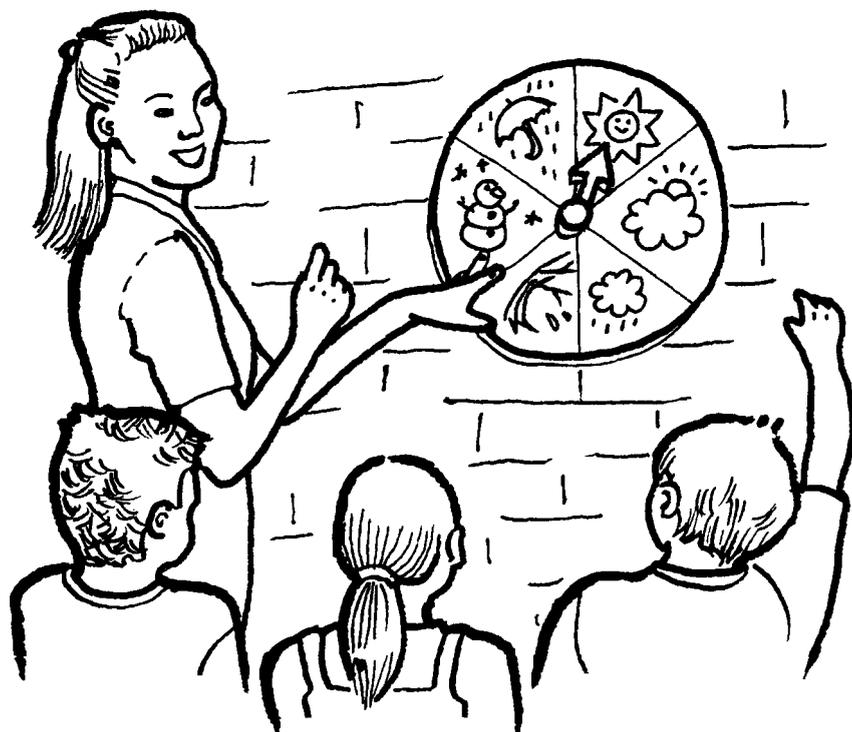
Children in third and fourth classes should also begin to relate the physical features of their own locality to those in the wider county and Ireland. For example, a local stream may be a tributary of a major river or the hills in the distance may be part of a larger range. Studies of localities beyond Ireland will also provide opportunities for the recognition and investigation of natural features.

By the time children are in fifth and sixth classes they should have developed a simple understanding of the main topographical features of their locality. Simple experiments, observation in the environment and the discussion of natural occurrences in the media can introduce children to some of the processes which form natural features.

A feature of this work in both the middle and senior classes should be the recognition of the inter-relationships between the natural features, flora and fauna of an area and the people who inhabit it and the ways people have changed or can change its character. This can help foster the child's aesthetic awareness and will complement studies in the visual arts.

Weather and climate

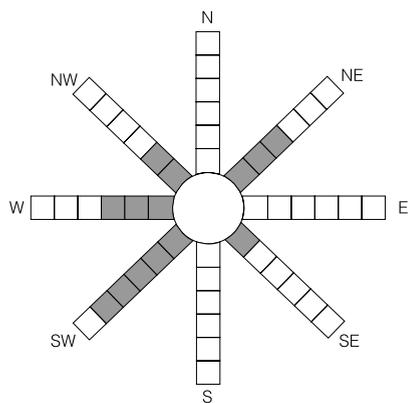
Weather is an aspect of the natural environment that impacts powerfully on the life of the child, and the weather patterns which form the climate of a region help to define the character of a place. The exploration and recording of weather patterns in the local environment and the comparison of these patterns with those of other areas help to form an important part of the child's understanding of the world and contribute to his/her development of a sense of place.



Talking about and recording weather phenomena is a natural element of the infant school day.

In infant classes discussions about the weather and its effect on the lives of people, plants and animals form a natural part of informal conversations. Simple pictorial recording of weather may be undertaken and in first and second classes seasonal patterns will be noted and links between observations will be made (for example, clouds with rain, cold weather with ice). This should lead children to begin to make simple predictions such as 'forecasting' that dark clouds may bring rain. Comparisons may also be made with weather experienced by people in other countries.

Children in third and fourth classes and in fifth and sixth classes will be enabled to refine their observations, measurement and recording of weather. The curriculum suggests the observation of details of some of the major cloud types and that they might be complemented by the use of simple equipment such as a thermometer and an improvised or purchased rain-gauge and weather vane. In fifth and sixth classes a domestic barometer might also be used. Children's mathematical and graphical skills will be developed in analysing the data collected, in presenting it in more effective ways and in making comparisons between patterns observed during different seasons, locally, in Ireland generally and in other parts of the world. The effect of weather and climate on the lives of animals, plants and humans in an increasingly wide range of areas will also form part of this strand.



Weather recordings, like the wind frequency and direction recorded on this windrose, provide opportunities for the use of information technologies to analyse data and to exchange it with other schools using electronic means.

Planet Earth in space

The study of the Earth, its weather and seasons leads naturally to the exploration of the setting of the Earth in the solar system and in space. In infant classes and first and second classes children will develop an awareness of the sun, moon and stars and will associate them with day and night. In third and fourth classes they should explore and record the position of the sun and the relative lengths of shadows in the morning, mid-day and evening, and come to associate directions with the position of the sun. The use of satellite images, video recordings, globes, charts and models will help children in fifth and sixth classes to understand the relative size, position and relationship of the Earth, sun and other bodies in the solar system and can awaken an interest in other heavenly bodies.



Environmental awareness and care

This strand encapsulates many of the attitudinal aims of the geography curriculum. It seeks to emphasise that children's experience of geography should

- lead to an informed appreciation of the environments that they encounter
- develop an awareness of the interdependence of natural environments and humans in local, national and global contexts
- develop an understanding of the impact of change and development
- encourage positive environmental action and a commitment to sustainable lifestyles
- instil a sense of personal and community responsibility as custodians of the Earth.

An appreciation of environments, both natural and human, is best fostered by a thorough knowledge of their distinguishing features and characteristics. By visiting and exploring different environmental features and in recording and analysing their observations children will come to appreciate them more fully and will become sensitive to the impact which change may bring.

In infants and in first and second classes the unit 'Caring for my locality' is firmly rooted in the child's awareness of his/her own environment, the natural features to be found there and the habitats which these provide for plants and animals. The unit also encourages the identification of simple yet important opportunities for individuals and groups to care for the immediate surroundings, for example in keeping the classroom tidy, in keeping the school and yard clean, in caring for plants and animals.

In third and fourth classes and in fifth and sixth classes the strand provides for the study of a range of environments in Ireland and other parts of the world and an examination of the interdependences and systems which are found there. People's relationships with natural and human environments are inter-linked with their health and lifestyles and with their economic, social and cultural activities. Many aspects of human activity may have a major impact on environments, often in quite unforeseen ways. Economic development is usually welcome when it enhances people's standard of living but its visual impact on the area and its effect on the health of people and on flora and fauna may be less desirable.

The issues that arise in the discussion of these topics are rarely simple or straightforward. In both the middle and senior classes the strand provides for the examination of the causes of and possible solutions to a local, national or global environmental issue. An important concern of the strand is that children should be enabled to examine such issues in an informed, critical way and they should be encouraged to contribute to their resolution whenever and wherever this is feasible.

Skills and concepts development in geography

- A sense of place and space
- Maps, globes and graphical skills
- Geographical investigation skills

The skills and concepts included in this section of the curriculum should be developed through the topics outlined in the content strands.

Skills and concepts development

This section outlines the skills and concepts that will be developed as children are engaged in geographical work. In general, these skills and concepts should not be taught in isolation. While occasional lessons will focus on some specific skills (for example on the reading and use of mapping techniques), the skills and concepts included in the section should be developed through the topics outlined in the content strands of the programme.

A sense of place and space

Two crucial concepts acquired through geographical education are

- the child's sense of place
- and
- his/her understanding of spatial relationships and location.

A sense of place

A sense of place refers to the child's appreciation and understanding of the distinctive characteristics of a place. This involves the distinctive contribution made by the people who live in a place, the human and natural features to be found there and the interactions of all these elements. This sense of place develops first in relation to the child's own home and immediate surroundings but then extends to include wider environments. These are experienced either directly through visits or indirectly through television, films, books, poetry, stories or other media. The child's sense of place also encompasses his/her attitudes to places and people, the sense of belonging and security in his/her home place and the attitudes he/she displays towards people and places in other areas.

The section *A sense of place and space* summarises the contribution which the strand units of the curriculum may make to the child's developing sense of place at each level.

A sense of space: spatial relationships and location

If we are to move around and operate efficiently in an environment we must have some notion of the places within it, how they are located relative to each other and how we may move from one location to another. This knowledge which a child or an adult has of his/her environment is usually termed a *cognitive map*. It is not a map in the conventional sense but is more akin to a mental model of the environment. It contains information about the places with which the person is familiar and other areas further afield, the spatial relationships between these and details of travel between them.

Cognitive maps are incomplete and selective. Their level of detail is influenced by a person's experience of the environment, his/her interest in certain areas over others, and by cultural and other factors. However, they are an essential component in understanding and operating in an environment and their development is a natural part of the child's growth and maturation.

Developing a cognitive map

Among the most basic tasks which young children must accomplish are the development of a sense of themselves as different from the physical world and the acquisition of knowledge about where places and objects are located in the world.¹ Both of these developments begin with the very earliest explorations the child makes in the home environment and considerable progress will have been made by the child by the time he/she comes to school.

Pre-school children come to realise gradually that they are distinct from the objects and features around them. However, even as they develop an awareness of a boundary between themselves and the external world, the boundary can remain blurred. They can continue to believe that some objects are linked to their own lives (a common example is the belief that the sun or moon follows them around), and they often assume that objects can have feelings and abilities of their own (for example, that clouds *decide* to move or that the stream *wants* to run down the hill). Many of these features will persist in the child's thinking when he/she comes to school.

¹ A very useful review of recent research on the development of children's spatial thinking and its implication for the teacher is contained in Joy Palmer, *Geography in the Early Years* (Routledge, London, 1994).

Concurrent with their development of a boundary between the internal and external worlds, very young children begin to develop representational spatial thinking, i.e. the ability to retain the image of an object, feature or event when it is no longer present. For example, they will demonstrate the ability to go to another room in the home to retrieve a toy which was used earlier. Initially, this ability is developed in the context of the home and is then extended to the other areas with which the child is familiar. At this stage the existence and location of objects is still defined in relation to the child or perhaps its home so that the child may be unable to relate objects to one another.

Children will continue to refine their understanding of the nature of the external world and develop their knowledge of the location of its features throughout their school lives and beyond. This process is dependent upon access to a broad range of environmental information: from direct experience through visiting and exploring areas, and indirectly from oral descriptions, television, photographs, maps and other media. Gradually, children will understand that objects and places exist without them being present and a concept will be acquired of the relative location of objects and places to one another.

This knowledge of places and their relative locations tends to develop in a cluster fashion. Children can develop detailed cognitive maps of a number of

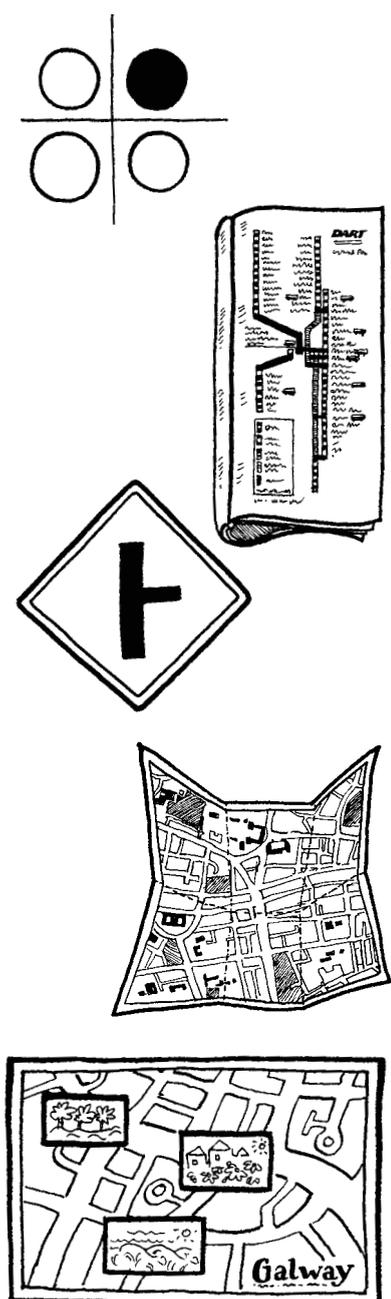
areas such as the home, the school, local shops and the home of a grandparent, but are unable to link these together. Eventually, when the child is able to visualise an area and relate its parts to the whole, he/she may be said to have developed abstract spatial reasoning.

In order to develop a cognitive map direct experience is essential. Children's pre-school experience will vary greatly. It may be limited by their own environmental background and such features as the growth of car usage. It is important, therefore, that activities in exploring the environment provided by the school complement the child's previous experience. In this way a broader variety of locations and movements will form an effective basis for the development of cognitive mapping skills.

Geography and the development of cognitive maps

The skills section *A sense of place and space* is designed to highlight opportunities for fostering the development of children's cognitive mapping abilities.

In the infant classes and in first and second classes, children should have opportunities to visit and explore the features of their local area. The discussions that arise should be used to help the child refine and use simple locational terms. Remembering and describing journeys such as those from the classroom to the school office,



Maps are encountered in many aspects of everyday life – on a cooker hob, in road signs, on postcards, in bus and railway timetables and as more conventional street maps and other plans. Learning to use this wide range of maps is an essential skill for the child.

around the school, from home to play spaces and longer journeys in the environment can further enhance the child's understanding of his/her space. So too can the giving and using of simple directional information.

As children in third and fourth classes and in fifth and sixth classes explore and learn about physical and human features in the local environment, in the county, in Ireland and in other parts of the world the range of environmental information which they acquire will grow. Direct experience of the environment will remain an essential component in developing their cognitive map of the locality and county, but the use of maps, photographs, models, globes, video recordings and other sources should enable them to incorporate some experiences of wider environments into their cognitive maps. Cognitive maps of the locality should become well developed so as to include an understanding of the main features of the area, their relative location and inter-relationships. However, the details of children's cognitive maps of wider environments will be less sophisticated.

Maps, globes and graphical skills

This section is concerned with graphicacy, i.e. the representation of geographical information in ways which do not rely primarily on linguistic or

numerical methods. Among the techniques involved are maps, plans, globes, models, graphs, charts, computer models, sketches and photographs.

Maps and globes

The use of maps, which record and make accessible information about places and their spatial relationships, is one of the key characteristics of geography and is a basic skill which adults and children encounter in everyday life.

Understanding and using maps involves the simultaneous use of a number of concepts and skills: in particular an understanding of aerial perspective; the use of symbols, scale and co-ordinates; and the ability to recognise features on the map and then link or align them to their real equivalents in the environment. Because of the complexity of some of these skills, it has been argued at times that map work is inappropriate for all but the most senior of primary school pupils. However, more recent research has shown that many mapping concepts, including the notion of perspective, the recognition of symbols and the use of co-ordinates, may be developed in quite young children if examples are drawn from familiar settings.² It should also be noted that although map reading and construction involve the use of all of these skills, the skills need not be taught simultaneously.

² A useful review of the development of children's mapping skills and how this may be reflected in teaching may be found in Patrick Wiegand, *Children and Primary Geography* (Cassell, London, 1993).

Map work in the primary school will range from the earliest drawings of familiar places completed by infants to the construction of plans and simple maps and the use of a variety of scaled maps, atlases and globes. Work on aspects of natural and human environments will provide the context and need for this development of mapping skills. The curriculum outlines how progressively more complex mapping concepts may be introduced at each level and how these may be developed and applied both in the reading of maps and in their construction.



Orienting or setting a map of the school and its surroundings. Using large-scale Ordnance Survey maps of the school area and locality is essential in the development of map-reading skills and should be incorporated into all local studies.

Other graphical skills

Children should have access to and use a wide range of other graphical skills. Aerial and satellite photographs have a close affinity to maps and, although they are expensive to obtain, children from first class onwards should have opportunities to examine and compare them with maps of the locality and other areas. Simply constructed models will enable children to record information about environmental features encountered in geographical and historical explorations in the locality. Making models can be particularly helpful in fostering children's spatial understanding and cognitive maps.

Graphs, charts and pictograms are further examples of graphical representations. The detailed scheme for the development of skills in the use of these is contained in the mathematics curriculum and is also included under 'Recording and communicating' in *Geographical investigation skills*.

Geographical investigation skills

- questioning
- observing
- predicting
- investigating
- estimating and measuring
- analysing
- recording and communicating
- evaluation

Geographical investigation skills

This section mirrors that entitled *Working scientifically* in the science curriculum and is included in the geography curriculum to emphasise the importance of using investigative techniques and critical thinking skills in the exploration of features and events in natural and human environments.

At each level a range of skills is outlined. These statements emphasise the role of the child as an active participant in the exploration of his/her own environment and seek to encourage the development of acute observation, the recognition of patterns, systematic investigation and critical interpretation of data. These techniques, in which all scientists engage at different times, are used by geographers when they investigate various environmental features in fieldwork. Geography lessons provide an ideal opportunity for the development and application of these skills.

Opportunities for the use of these skills exist in all the strands of the geography curriculum. For example, during the exploration of natural landscapes children will collect a range of natural materials and these may be examined, sorted and classified and the findings recorded using these investigative skills. The relationships between soil types and the flora to be found in an area, the analysis of weather observations and simple efforts at forecasting will provide further applications. Similarly, the collection of data on traffic flows, methods of transport, and information on where and how people live and work, will involve skills of observation, data collection, the recognition of patterns, interpretation and communication.

A detailed discussion of the development of these individual skills and the concepts associated with them is contained in the *Teacher Guidelines for Science* and need not be repeated here. The exemplars which are included in the pages of these sections in the geography curriculum indicate how each skill can be applied in a geographical context.

School planning for geography

School planning for geography

Efficient planning by the school and teachers will be crucial for the successful implementation of the geography curriculum. This section of the guidelines will examine two aspects of this planning process:

- curriculum planning issues in geography
- how planning might be organised.

Curriculum planning

Some of the issues which may need to be discussed as part of the school's planning for geography include the following:

The purpose and nature of geography in the school

Geography should involve the simultaneous acquisition of knowledge about the natural and human elements of local and wider environments, the development of geographical skills and concepts, and the fostering of important attitudes. Exploring and discussing the nature of geography, its associated skills and the development of concepts and attitudes can clarify for the school staff the role which geography may play in the curriculum and is a prerequisite for the evaluation of teaching resources and approaches.

The exploration of the locality of the school

One of the most important aspects of the geography curriculum and the wider SESE programme is the emphasis placed on the exploration of the local environment of the child and school. The planning process should involve teachers in becoming familiar with the locality of the school, the people and communities in the area and the human and natural geographical features to be found there. Some suggestions as to where advice and support for this process may be found are included in these guidelines on pp. 34–38 and in the *Teacher Guidelines for History*.

As the school staff becomes familiar with the locality they may then be enabled to identify a range of environments and features suitable for inclusion in the geography programme. The pattern underlying the curriculum recommends that children's geographical learning and investigations should develop in the first instance in small-scale areas in the locality and that the study of the local environment should become progressively more detailed and cover a widening area. An important task within the planning process will be to delineate clearly the extent of the local area on which work will be based at each level in the school. The section *The contexts for geographical study* (see p. 9 above) will provide some guidance but the advice it contains will have to be interpreted to suit local

circumstances. Planning should also help to co-ordinate local studies in the school, so as to ensure that children visit and explore the environment thoroughly throughout their primary school years.

Integrated theme teaching and more subject-centred approaches

An integrated curriculum is particularly suited to younger children because they view the world and their experiences in a holistic way. Many schools may, therefore, choose to organise work for the infant and junior classes within SESE and other areas of learning using a number of themes.

As children grow older, appropriate teaching strategies can vary; they may include a holistic (or theme-based) approach, some cross-curricular integration and a subject-centred focus. Theme teaching and the use of subject integration will remain important at all levels, but these approaches rely on careful planning by the staff to ensure that the role and distinctive contribution of each subject are realised.

The amount of time to be devoted to the subject

Given that an integrated approach will be commonly used at all levels of the primary school, it is probably more helpful if schools look at the amount of time to be devoted to subject areas over a term or year, rather than attempt to allocate a specific weekly amount of time to each subject. Schools should also discuss the general amounts of time to be devoted to areas within the curriculum, having regard to the circumstances of the school, the needs of pupils and particular priorities that have been identified by the staff.

Teachers may find it more useful to concentrate available periods on one aspect of SESE at a time. Time allocations should remain flexible as work in each area should complement learning in other subjects, and individual teachers should be free to use their professional judgement to adjust the guidelines to suit individual pupil needs and the class circumstances.

A broad, balanced and coherent geography curriculum

- a broad range of local studies at all levels
- a gradual extension of children's awareness of environments in the county, in Ireland, Europe and the wider world
- a balanced and accurate understanding of the lives and environments of people in other countries
- adequate opportunities for the development and application of scientific investigative skills in physical and human geography
- development of the reading, use and construction of maps
- continuity and progression
- the fostering of local, national and European identity

A broad and balanced geography curriculum

Planning should help teachers to ensure that the geography programme

- includes a broad range of local studies at all levels. Two major concerns should be addressed in these studies.

Firstly, local studies should answer the child's need to understand the world which he/she encounters and they should make a major contribution to the development of the child's sense of place and his/her cognitive mapping ability.

Secondly, the curriculum stresses that as far as possible the study of the features and processes of natural and human environments should begin in the locality at all levels.

The identification of a range of suitable natural and human features for inclusion in the programme will be important in ensuring a broad and balanced curriculum in the primary years

- gradually extends children's awareness of environments in the county, in Ireland, Europe and the wider world. While the curriculum places a great emphasis on local studies, it should be remembered that the recognition of similarities and differences between environments can enrich children's understanding.

Opportunities to extend elements of local studies to include examples from national and wider contexts should be identified at all levels. In the middle and senior classes, in particular, the curriculum provides for the exploration of geographical themes (people and communities, inter-relationships with the natural environment, settlement, people at work and transport and communications) in a number of varying contexts. At both levels, the environments chosen should include an Irish environment which contrasts with the home area of the children, a European location and a non-European area. Careful selection of the areas to be included in these studies will ensure that children have opportunities to study the peoples and features in a number of areas in Ireland, in developing countries and in developed countries.

- ensures that children acquire a balanced and accurate understanding of the lives and environments of people in other countries. A balanced and informed awareness of the diversity of environments and peoples is an important aspect of children's developing understanding of the world and a contributory factor in their personal and social development as citizens of a global community. This matter is discussed further in the section *Learning about other places*, pp. 116–119.

A balanced and informed awareness of the diversity of environments and peoples is an important aspect of children's developing understanding of the world and a contributory factor in their personal and social development as citizens of a global community.

- provides adequate opportunities for the development and application of scientific investigative skills in geography, especially in the study of local environments. A close affinity exists between the geography and science curricula, and this should be exploited as far as possible. In many cases, the study of a natural or human environment will involve the simultaneous investigation of natural or built features, the flora, fauna and materials to be found there, and the activities of people. All of these will provide instances in which the children may observe, collect data, recognise patterns, make predictions, experiment and analyse findings
- identifies how the reading, use and construction of maps may be developed through the units of work on natural, human and environmental themes. Children should have access to a wide range of maps of a variety of scales. Map work activities should also reflect the diversity of purposes for which maps may be used: to enhance children's understanding of an area, to help them find and follow routes and to enable them to record and present information
- provides for the systematic development of graphical skills. Using graphs, charts, globes, atlases, photographs, electronic images and other graphical sources to obtain and present geographical information about people, their activities and the features found in natural and human environments will be an important aspect of the curriculum. Using models to convey environmental information will involve the application of the *Designing and making* skills outlined in the science curriculum and will complement work from the Construction strand in the visual arts curriculum
- provides for continuity and progression. Efficient use of the flexibility provided within the curriculum in the selection of strand units and the environments studied, particularly in the middle and senior classes, should ensure that children acquire an understanding of a variety of natural and human environments and that significant gaps and undue repetition are avoided. Similarly, there should be continuity and progression in the methods and approaches used with pupils
- fosters the child's sense of local, national and European identity. A balanced programme of geographical studies incorporating local and national elements should help the child to develop a critical appreciation of the peoples, landscapes and way of life of the locality and Ireland. Similarly, the study of elements of European geography should awaken his/her interest in the landscape, peoples and culture of the EU, while some knowledge of the story of European co-operation will make an important contribution to the child's awareness of his/her sense of European citizenship.

The primary purpose underlying all assessment is to enhance the learning experiences of the child.

Developing an assessment policy

Assessment is an integral part of the teaching and learning process in geography as in other areas of the curriculum. The school plan for geography should help teachers to come to a shared understanding of the way in which the progress of children in geography can be assessed, documented and reported. Discussions between teachers should also foster a sense of how an approach to assessment that is closely linked to teaching and learning can enhance the learning experience for the child, facilitate the exchange of accurate information about pupils' learning among the staff and promote informed debate about pupil progress and teaching approaches. The arrangements arrived at for the assessment of pupil progress in geography will be informed by the school's overall policy for assessment, recording and reporting.

Some of the assessment issues which may need to be discussed as part of the school's planning for geography include the following:

The purposes of assessment

Discussion of the many ways in which assessment can help to enrich teaching and learning can foster an appreciation of its role in the implementation of the geography curriculum. Assessment can

- help to identify what pupils know, understand and can do

- show the different rates of progress that children are making
- help to check learning outcomes against teaching objectives
- help to plan future learning experiences
- identify areas of difficulty in order to respond to the learning needs of the child
- facilitate communication between teachers about pupils
- provide the basis for reporting to and communicating with parents and others
- provide information for the transfer of pupils between primary and post-primary schools
- help teachers and schools to make decisions about the development and implementation of the curriculum.

A range of assessment tools

In order to achieve a broad and balanced picture of the child's progress in the acquisition of knowledge and skills and in the development of important attitudes, the curriculum advocates that a diversity of assessment methods be utilised. Among the tools recommended are:

- *teacher observation*: the details of children's learning which teachers notice as the units of the geography programme are explored and taught
- *teacher-designed tasks and tests*: the wide range of activities in which children will be engaged while studying geographical topics

Assessment tools in geography

- teacher observation
- teacher-designed tasks and tests
- work samples, portfolios and projects
- curriculum profiles

The assessment tools in geography have been recommended because of their close and complementary relationship to teaching and learning.

- *work samples, portfolios and projects*: in which samples of the children's work completed during some of the tasks above will be compiled
- *curriculum profiles*: a means of assessing and recording the child's progress using indicators that would include a summary description of the knowledge, skills and attitudes to be expected at various levels in the curriculum.

While assessment will help teachers to clarify the learning achieved by their pupils and so assist them in planning future learning, it should not distort the educational experience. The close integration of assessment with teaching and learning is essential and ways in which this might be achieved should be considered by teachers in planning for geography.

In particular, assessment should be an on-going process. For example, asking a child to complete a simple plan or map of the types of shop to be found along a street will be an important teaching tool in raising the child's awareness of the different economic activities which take place in the local area. However, the completed map will also indicate the extent of the child's ability to categorise different types of shops and may provide evidence of the development of his/her mapping skills.

Assessment and the aims and objectives of the curriculum

Teachers will be guided in the selection of assessment tools by the need for assessment to reflect the aims and objectives of the curriculum, particularly the importance attached to the development of geographical skills and concepts as well as knowledge and attitudes.

Manageability of assessment

By placing an emphasis on assessment information that can be obtained from normal teaching and learning activities, the time devoted to assessment can be minimised. Arrangements for the assessment and recording of pupil progress should not detract unduly from teaching time.

A common understanding of assessment

Sharing teaching experience and discussing how judgements may be made about children's work and progress can improve the quality and usefulness of information gleaned from assessment. A range of items of children's work arising from teacher tasks and tests, samples included in portfolios and curriculum profiles might be discussed by a group of co-operating teachers and these discussions could lead to the sharing of teaching experience and the moderation of assessment in the school.

Recording and reporting: continuity and progression

The range of assessment tools recommended in the curriculum provides the school and teachers with a system of assessing and recording each child's progress in geography. The assessment information collected in this way may be further enriched through teacher-parent discussions and through noting aspects of the child's learning observed by the parent. All the information observed and collected about the child's learning will be crucial in determining future educational experiences for the child and it should provide the basis for reporting to and discussion with teachers, parents and others about the child's progress.

The communication of information about the child's learning to parents and others will be facilitated by the use of a pupil profile card, i.e. a means of recording the results of the child's learning and assessment each year. SESE and geography would form one section of this evaluation of the child's progress.

The flexibility offered to schools by the geography curriculum (and the other SESE curricula) will mean that the keeping of records of work completed by pupils (for example in the form of portfolio assessment) will be an important factor in ensuring continuity and progression. For example, recording the range of environments encountered by the child at each stage of the geography programme will be essential in ensuring a broad and balanced curriculum. Within the context of the general school policy for assessment provision should be made for common forms of curriculum profiles and class records and these should be available in the school for the use of successive class teachers. The records should help in the planning of work in subsequent years, both in the selection of strand units and in maintaining the balance of skills development and content.

Developing the plan for geography

- create a common understanding of the nature and role of geography
- seek to utilise the interests and aptitudes of teaching staff to the full
- provide real help and support to the teacher without creating undue paperwork
- determine how the school intends to phase in the new programme
- involve review and evaluation during development
- provide for planned review after a fixed period
- contribute to the overall school plan which will be reviewed by the board of management
- involve communication and consultation with parents and the board of management at appropriate stages

Organisational planning

Developing a shared sense of purpose for geography

Planning for geography in the school should

- create a common understanding of the nature and role of geography in the curriculum of the school. Planning will be a collaborative and consultative process involving the principal, teachers and, where appropriate, parents and the board of management
- seek to utilise the interests and aptitudes of individual teachers to the full.

Some of the work of developing or co-ordinating the implementation of geography might be delegated to a teacher or teachers with a particular interest or expertise in the area. They may be able to stimulate discussion on aspects of the curriculum, help to advise others on a range of new approaches in teaching and assessment, and assist in the co-ordination of teaching resources for the subject

- provide real help and support to the teacher without creating undue paperwork. The re-examination of geography in the school will eventually lead to the emergence of a written statement of the school's policy for the subject. This document will be a useful record

and reference point for the staff. However, the main aim in planning should not be the production of a written policy: the process in which people are engaged and the clear sense of direction and purpose it gives to the work of teachers and the school are more important than any formal record

- involve review and evaluation during development and after a fixed period. Regular discussions in the early stages of implementation can help to refine the draft programme by identifying those aspects that have been most successful and those that may need further development or support. Once in place the policy for geography should be revisited on a regular basis. The effectiveness of the programme can be evaluated and amendments can be made
- contribute to the overall school plan which will be reviewed by the board of management. Within the resources available to it, the board will provide support for the development and implementation of the school plan
- involve communication and consultation with parents and the board of management at appropriate stages. Discussions, circulars, information sheets and teacher-parent meetings are among the methods which may be used to facilitate this process of communication.

Identifying support for implementation

Planning for the geography curriculum will also involve reviewing how existing resources could best be used to support the programme and identifying where further help is required. Some useful strategies and potential sources of support are discussed below.

Parents, relatives of the children and other local people

The emphasis which the geography curriculum places on local studies will mean that members of the children's own families may help to enrich and support the programme in a number of ways. Parents can play a very useful role in helping to identify and understand natural environments, work-places, buildings and other places in the locality which might form part of the programme. Parents, or their friends and acquaintances who have lived or worked in the area for some time, can be invaluable sources of information for teachers during the preparation and planning of local studies.

If parents are made aware of the importance of the child's own home and its immediate surroundings in the programme for infants and first and second classes they will be able to help the child to explore the geography of these areas.

An important aspect of the programme is concerned with the work and lives of people in the area. This work can become real and tangible for the child if parents or other local people are willing to talk to children about their lives, work, cultural and other interests and the features and traditions of the local area. Aspects of some occupations may be suitable for demonstration in the classroom and if this can be followed up by a visit to work-places, farms, buildings or other locations in the company of the speaker concerned, so much the better. The school might find it useful to compile a list of people among the parents and local community who would be willing to introduce children to particular aspects of the locality.

Finally, if the children are to explore and visit the local environment regularly the help of parents will be invaluable. The school plan should contain clear guidelines on the involvement of parents and others in such activities.

The local library

Many county libraries have useful collections of maps, books, articles and photographs concerning areas, especially urban areas, within the county. Getting to know the librarian and discussing the school's requirements is advisable.

Planning section of the local authority

Planning departments of county councils and other local authorities maintain comprehensive large-scale maps of their areas. These are particularly useful in rapidly growing suburban areas where the rate of building may mean that published maps are somewhat out of date. Some planning departments may be able to supply photocopies of their maps for a charge.

The Ordnance Survey

The Ordnance Survey produces a wide variety of maps and some aerial photographs. These are discussed more fully in the section on *Maps and map work* and in the *Appendix* below. Details of the maps and photographs available may be obtained from: Ordnance Survey (Map Sales) Office, Phoenix Park, Dublin 8.

The Land Registry

Large-scale maps of the school area are expensive. If a map is required for the land on which the school stands, it may be possible to obtain it more cheaply from the Land Registry, located at the Four Courts, Dublin 7. However, to locate such a map it is necessary to have details of the registered owners of the land on which the school stands. (The document in the Land Registry to which the map will be attached is called a folio and can provide useful and interesting information about the history of the site.)

Local businesses and the chambers of commerce

The study of human geography will entail learning about some of the businesses or factories in the area in which local people work. Approaches may be made directly to the firms involved or schools may find it more convenient to approach the secretary of the local chamber of commerce who may be able to put the school in contact with individual members of the chamber willing to host a visit to a factory or other work-place.

Local farms, farming organisations and co-operatives

A study of a farm will represent an important aspect of a local study in a rural area. Some farms now encourage school visits (though teachers should ensure that a realistic picture of modern farming is presented rather than an idealised and romantic one). Several farming organisations organise urban-rural days each year on which visits to farms are facilitated. Local milk or vegetable processing co-operatives may also be able to put schools in touch with some of the farmers who supply them with fresh produce. The discussion of farm safety issues should be an essential element in the preparation for such visits.

In recent years, the implementation of a number of EU farm policies and schemes has involved farmers in the collation of enormous amounts of data about land use on their farms. Farmers participating in these schemes have had to plot areas used for crops, forage, forestry, buildings etc. on Ordnance Survey maps of their holdings and these have been verified through the use of aerial photography. Copies of these maps will be held by farmers and in some cases they may also have copies of the aerial photographs. These maps and photographs, if available, could enhance a farm study considerably.

County committees of agriculture

Each county has its own committee of agriculture responsible for the development of agricultural activities in its area. The agricultural advisers and the publications of the local committee can supply much information about farms and farming in the county.

Transport providers

Local transport providers, including bus, train, shipping and airline companies, should be able to supply maps and timetables for their routes. Analysing these, especially in the planning of practical journeys and for the transport of goods, will develop important practical skills in geography and mathematics and will enhance children's spatial awareness.

The Geological Survey of Ireland

This body has a geological museum at Beggar's Bush, Haddington Road, Dublin 4 and produces geological maps of Ireland.

Other local and national agencies

The work of a number of national agencies and their local or regional offices will relate to aspects of the geography programme. Many of these agencies produce material specifically for schools, and in some cases they may be willing to supply a speaker to schools or may help to facilitate visits by pupils. Details of the local and national offices of most of these bodies will be found in the telephone directory. Among these organisations are:

An Bord Gáis

An Bord Glas

Bord Iascaigh Mhara

Bord na Móna

Coillte Teo: the Irish Forestry Board

Department of Agriculture, Food and Forestry

Department of the Marine

Dúchas: the Heritage Section of the Department of Arts, Heritage, Gaeltacht and the Islands (has responsibility for national parks and inland waterways)

Electricity Supply Board

ENFO: the Environmental Information Service

Environmental Protection Agency
 IDA Ireland
 Irish Peatland Conservation Council
 Regional tourism boards
 Teagasc: the Agriculture and Food
 Development Authority
 The Meteorological Service
 The Tree Council of Ireland.

*Office of the European Parliament
 and*

*Office of the Commission of the
 European Union*

These offices produce a range of booklets and maps that can be of use in the study of life in European countries.

Development agencies

Many voluntary and state-supported development agencies, such as Afri, Christian Aid, Concern, Gorta, Trócaire etc. can supply information and educational material about life in developing countries and the problems facing people in these areas. The National Committee for Development Education, 16 South Cumberland Street, Dublin 2, co-ordinates the educational initiatives of a wide range of these agencies and maintains a library of development education materials.

Embassies and tourist authorities

Embassies or diplomatic representations in Ireland and tourist offices of foreign countries generally provide brochures, maps and other material about their areas. Some of these publications may present an incomplete picture of the countries involved and they will need to be supplemented with other materials.

*Publications, library books,
 textbooks, computer software*

During planning, teachers should review the computer software, CD-ROMs, reference books and story books available in the school and class library. Discussing and recording how these may support the units of the geography plan will be a useful aid to teachers as the programme is implemented. This may also highlight gaps or weaknesses in the school's resources for the subject and can help in planning systematic purchasing for the library and school.

Charts (whether purchased or made by teachers) and photographs will be valuable in geography lessons. It may be possible for a teacher or parent to photograph items of interest in the locality and other areas.

At times teachers may not be aware of the books and other resources which are available throughout the school. Some form of indexing or filing of teaching materials, including photographs, books, maps, filmstrips, videos, etc., can help teachers greatly in the implementation of the curriculum. Some aspects of this work might be the responsibility of a geography or SESE co-ordinator in the school.



The curriculum advocates that the many different types of homes lived in by pupils, their families and other local people should be identified, recorded and celebrated; for example, houses, caravans, trailers, flats, cottages, etc.

Carefully chosen, well-produced textbooks and atlases may be an important source of teaching material for geography. The policy for geography should reflect the general policy of the school regarding the selection, purchase and use of textbooks. However, it should be noted that textbooks, of their very nature, cannot adequately cover local studies and should therefore be regarded as one source among many for the teaching of geography. The exclusive use of one textbook per class could have a constricting influence on the selection of strand units and, if resources permit, the availability of classroom sets of two or more different textbooks would facilitate greater flexibility.

Care should also be taken that the textbooks chosen conform to the requirements of the curriculum, particularly the advice contained in the *Planning* pages of the curriculum statement.

Access to good-quality atlases, suited to the needs and abilities of pupils, will also be essential and many now include excellent satellite and/or aerial photographs of land areas and the globe. A number of such atlases are now available and should form part of the resource material in infant and junior classrooms. The use of an atlas on CD-ROM should also be considered.

Radio, television and video

A number of radio and television programmes broadcast for educational and entertainment purposes may support some of the units of work in the curriculum, particularly those involving international themes. Some programmes made about aspects of the geography and environments of Ireland will also be useful. Generally, these programmes are best used in recorded format; teachers can then view the material in advance and select or edit the sections most suitable for their own classrooms.

Education centres and other in-service education providers

Local education centres provide opportunities and support for teachers who wish to enrich their knowledge of local areas and develop further their range of teaching and assessment strategies.

Classroom planning for geography

Classroom planning for geography

The experiences of their environments which children bring to school and the geographical work they have completed to date will form the starting point for the teacher's planning.

This section gives advice on the planning of the teacher's work. It contains

- a discussion of a number of issues which teachers will need to consider when planning for geography
- a number of planning exemplars, illustrating possible approaches to drawing up a geography scheme.

Planning issues for the teacher

Many of the most important considerations when planning at classroom level are discussed above in *Curriculum planning* (see preceding section pp. 26–32).

In addition to these the following should be taken into account:

The learning experiences and needs of pupils

The extent to which children have opportunities to explore the environment outside school and even the games which they play can influence the development of their sense of place and their knowledge of their surroundings. These should be considered by the teacher who will also find the class records and conversations with the previous teacher useful when planning a scheme of work.

The geography curriculum and the school plan

The content of the strands and strand units of the curriculum and the accompanying sections which describe the development of geographical skills and concepts at each level will provide the basis for the teacher's work with the class. Classroom work should also fulfil the requirements of the school plan for geography.

Planning and selecting content

When choosing and developing units of work through which the content of the programme may be delivered, the criteria for planning content which are contained in the curriculum should be considered. In particular, planning should ensure that the locality of the school is thoroughly studied and that units of work should provide opportunities to explore a range of landscapes and geographical themes in a number of varied contexts (local, Irish, European and non-European). Schemes of work should also be sufficiently flexible to respond to and capitalise on children's experiences and natural phenomena (for example a storm, an earthquake, the building of a new road) which may occur from time to time.

Planning for skills and concepts development

The scheme of work developed by the teacher should also maintain a balance between the treatment of content and the development of concepts and skills. The treatment of the strand units should show progression in the level of skills used and in the depth of treatment they are accorded.

Progression might be shown by

- increasing the scale of the environment under study
- studying more complex processes and features
- using more generalised knowledge and abstract ideas
- expecting greater accuracy in practical investigations such as observations and recording
- encouraging the discussion of more involved issues and problems and developing more informed and sophisticated attitudes.

Approaches and methodologies

An effective geography programme will entail the use of a variety of techniques and classroom approaches. Approaches in which the children are encouraged to visit and explore the environment, ask questions, and engage in research and investigation will be crucial for the success of the programme. Identifying opportunities in which children may develop and use a wide range of map work, graphical, computer and other skills in practical situations will also be an important aspect of the teacher's planning. Suggestions for a range of methodologies that are particularly suited for geographical topics are described in a later section of these guidelines (pp. 62–156).

Providing for individual differences

A number of techniques may be used to provide a range of learning activities appropriate to the individual needs of pupils. Teachers could consider

- using a mixture of whole-class teaching and focused group work. A common lesson content might be used with all pupils but different groups of children could be set tasks of various complexities

- planning topics so that opportunities are provided for alternative investigation work for the more able and/or less able. The paragraph above on *Planning for skills and concepts development* provides examples of the aspects of topics that can influence the level of challenge involved
- using a range of questions and providing a range of tasks. Teachers' questioning in oral discussion should use a range of skills from simple recall to more complex comparative and analytical skills so that all pupils will have opportunities for success while the more able will be challenged. Similarly, tasks involving map work and other skills may be graded for less able and more able pupils
- planning for the use of a wide range of communication skills. Many pupils will have developed a sophisticated geographical understanding yet will be unable to communicate this in written form. Opportunities should be provided for children to record and tell about their work using drawing, modelling, computer-aided work, etc.
- intervening to give individuals and groups the direction, stimulus and encouragement they need as the children are engaged in activities.

Planning for linkage and integration

Within the curriculum statement the term *linkage* is used to refer to integration within a subject while *integration* refers to cross-curricular connections. Integrated learning, both within subjects and between curricular areas, is an important principle of the curriculum. Integration also allows blocks of time to be utilised in the most efficient way and is particularly useful in multi-class situations in small schools.

A number of factors are necessary for integration and linkage to work successfully. These include:

- systematic planning by the teacher in order to ensure continuity and progression
- taking careful account of curricular requirements
- the structuring of topic work. Integrated topics work best when they have a single subject bias or when they emphasise particular subjects
- whole-school planning to ensure adequate subject coverage and a balanced range of content within each subject.

Linkage within geography

Although the curriculum is presented in three strands teachers will find that almost all geographical studies will encompass elements from at least two and perhaps all three strands. The study of the locality and other environments will normally include the examination of both human and natural environmental features and these studies may also give rise to the discussion of environmental issues and concerns.

For example, a study of children's homes may encompass aspects of human geography, natural environmental features in which the home is located and natural processes such as weathering and erosion. The study could also be extended to include homes and settlements in a number of places in Ireland and in other countries and to a discussion of how natural and other materials have been used in the construction of dwellings.

Consideration could also be given to how the construction of homes has impacted upon the environment.

It should also be remembered that the study of each unit in the geography curriculum will provide opportunities for the simultaneous development of geographical skills and concepts.

Integration within SESE

Many opportunities exist for valuable links to be made between geography, science and history. The close alignment of *Geographical investigation skills* and *Working scientifically* is intended to demonstrate how many investigations in geography can provide opportunities for the application of scientific methods while the construction of models of environmental features will develop the skills outlined in *Designing and making*. The examination of natural features and fauna of local and other environments will complement studies of *Living things* in science while the strand *Environmental awareness and care* is included in both curricula.

The study of environments will inevitably lead to the discussion of how places and features have been shaped by the actions of people in the past. Thus, studies of local environments in geography may be closely linked to the strand *Local studies* and to the biographies of individuals explored in the strand *Story* in the history programme.

Integration between geography and other subject areas

Many content elements in the geography curriculum have close links with other curricula. The cross-reference notes included in the curriculum statements will help to identify possibilities for integration.



Many of the features which give a place its distinctive character are the result of the actions of people over several generations in the past. History and geography play complementary roles in helping children to understand the world around them.

Special links with SPHE and mathematics

The links between geography and two other curricular areas are highlighted in the curriculum. The development of the child's sense of identity and citizenship to which geography contributes is developed more fully in the SPHE curriculum while many of the skills outlined in *Maps, globes and graphical skills* will be dependent on the child's mathematical development.

Other curricular areas with which integration may be effected include:

- visual arts: developing aesthetic awareness in the environment and during construction activities
- physical education: outdoor and adventure activities complementing map work and the development of the child's sense of place and space

- language: in the discussion and presentation of geographical ideas, through encouraging the child's awareness of languages in other countries and through identifying the relationships between geographical features and place-names in Irish and English.

Integration using a broadly based theme approach

A theme such as 'Water', 'Homes', or one based on a novel or story can be chosen and explored in a number of ways which would use elements of many different subject areas. This approach is often used with very young children. It requires careful planning in order to avoid superficial treatment of a wide range of content.

Seasonal factors

Work requiring visits in the environment will obviously be affected by weather though opportunities should be sought to view local environments on a number of occasions in the year so as to observe seasonal changes. Locations and sites to be explored in the environment may be quieter, or less crowded, or safer at certain times of the year and this should be borne in mind when planning a scheme of work.

The availability of resources and support

It is helpful to establish what resources and support might be available and when they will be in use by other teachers and classes. For example, different classes may need access to books from the library at particular times, parent volunteers willing to help with visits may be assisting other teachers and the factory or farm may not be able to accommodate a visit at certain times of the year.

Assessment

When planning units of work teachers should also identify how pupil progress might be assessed and work recorded. As the section on assessment in the curriculum makes clear, much assessment information may be obtained as teaching and learning take place: if the expected outcomes of a learning task are identified clearly in advance by the teacher then the progress of pupils will be more readily assessed. The information about the pupils' learning gleaned from teacher observation, teacher-designed tasks and tests and other means will provide the basis for the planning of follow-up activities and future work in geography.

Some planning exemplars

The exemplars which follow illustrate how different approaches to planning, teaching and learning can create a variety of schemes of work for geography. In each case, a summary overview of the scheme is presented followed by a detailed description of some of the units of work included. *The schemes and units of work used are not prescriptive and have been chosen by way of illustration only.*

Exemplar 1: Infant classes

The scheme of work in *Exemplar 1* below for junior and senior infant classes is constructed around a number of themes in which different aspects of the SESE curricula are addressed in an integrated, cross-curricular approach. Suggested possible activities for some of the themes are outlined in *Exemplar 1A* on the pages which follow.

Exemplar 1

A possible scheme of work for infant classes

	Junior infants	Senior infants
Term 1	Myself Autumn walk People who help me Light and dark	Myself and my family The hedgerow Shops and shopping Christmas
Term 2	Winter Toys and games Spring	Clothes Journeys A visit to the farm
Term 3	Water School A visit to the seashore	Growing and changing Food Holidays

Exemplar 1a

Sample units of work from a scheme for infant classes

Geographical aspects	Scientific aspects	Historical aspects	Other curricular areas
<p>People who help me</p> <p>Living in the local community</p> <ul style="list-style-type: none"> become aware of the roles of people in the home, school, in the local community, in towns or countryside nearby and in wider environments <i>nurse, garda, priest, post office worker, workers in shops, lollipop person</i> become aware of buildings and places where people work, especially those in the locality <i>home, school and immediate environs, shops, farms, offices, parks, in transport activities</i> simple picture maps of these places <p>People and places in other areas</p> <ul style="list-style-type: none"> awareness of people in other places who help us <i>farmers in Ireland and other countries</i> <i>people who make our clothes</i> 	<p>Materials used by these people</p> <ul style="list-style-type: none"> observe and investigate a range of familiar materials in the immediate environment <i>foodstuffs in bakery, wood, textiles, plastic</i> describe and compare materials, noting the differences in the colour, texture and use <i>effect of mixing and heating bread ingredients</i> 	<p>My family</p> <ul style="list-style-type: none"> become aware of and identify the members of the family; compare relative ages: old/older, young/younger collect simple evidence <i>photographs of family members</i> explore and discuss how families care for each other discuss developments in the life of the family and things which have stayed the same 	<p>Language/history: Story</p> <ul style="list-style-type: none"> listen to, discuss and record stories about people who help us, people who have helped others in the past <p>SPHE: Myself and others; Myself and the wider world</p>
<p>School</p> <p>Living in the local community: school</p> <ul style="list-style-type: none"> become aware of and appreciate the people in the school community describe areas within the school associate activities with areas within the school and outside the school make simple drawings of school and immediate surroundings, journeys to and from school 	<p>Materials in the school</p> <ul style="list-style-type: none"> observe and investigate a range of familiar materials in the immediate environment <i>wood, textiles, plastic, metal, rocks</i> describe and compare materials, noting the differences in the colour, texture and use group materials according to certain criteria <i>strength, colour, texture, flexibility</i> 	<p>School</p> <ul style="list-style-type: none"> listen to and discuss story of the school's founder(s) record and dramatise events investigate what school days were like for parents 	<p>Language</p> <p>SPHE: Living in the school community</p> <p>PE: Outdoor and adventure activities</p> <ul style="list-style-type: none"> simple exploring or walking using picture maps as an outdoor activity
<p>Winter</p> <p>The local natural environment</p> <ul style="list-style-type: none"> become aware of, explore and discuss elements of the local natural environment <i>rain, snow, ice in the yard</i> record experiences and observations using pictures <p>Weather</p> <ul style="list-style-type: none"> observe and discuss a variety of weather conditions using simple vocabulary record weather observations using a weather chart or diary 	<p>Plants and animals</p> <ul style="list-style-type: none"> observe, discuss and identify a variety of plants and animals in the immediate environment become aware that animals and plants undergo seasonal change in appearance or behaviour <p>Materials: variety and characteristics/change</p> <ul style="list-style-type: none"> identify materials to keep us warm observe effect of heating and cooling on ice, snow 	<p>Story</p> <ul style="list-style-type: none"> listen to, discuss and record stories <i>stories about stormy weather</i> <i>stories set in winter</i> 	<p>Language</p> <p>SPHE: Developing citizenship</p> <p>Visual arts</p> <ul style="list-style-type: none"> winter scenes could provide subject for painting, drawing, friezes, etc. <p>Drama and/or PE</p> <ul style="list-style-type: none"> express a winter storm in drama or movement

- become aware of some of the effects of different weather conditions on human, animal and plant life in the local environment
- Caring for myself and my locality
 - appreciate the importance of environmental cleanliness
 - identify and implement simple strategies to promote environmental cleanliness
 - appreciate that people are living things who share the environment with plant and animal life
 - observe and develop an awareness of living things in local habitats

The hedgerow

- The local natural environment
- become aware of, explore and discuss some aspects of the natural environment in the immediate locality of the school
 - note similarities and differences in environments
 - compare the tallest and the smallest plants in the hedgerow
 - contrast the hedgerow plants with those in the school garden
 - observe how the hedgerow has been used by people, by animals
 - compare with areas where the hedgerow has been cut down
 - observe, collect and compare materials
 - stones, wood, leaves, soil
 - record location of hedgerow and its features in simple picture maps

Living things

- observe, identify and record some of the plants and animals in the hedgerow
- note where the various plants and animals live
 - under leaves, on the trees, in the grass

Materials

- sort, group and classify materials found in the hedgerow

Environmental care

- identify how plants and animals depend upon each other in the hedgerow
 - birds and squirrels eating seeds, insects on bark of trees, animals and people spreading seeds of goosegrass
- discuss ways in which the hedge is damaged
 - litter, where it is broken down or cut down
- suggest ways in which we can improve the hedgerow
 - clearing up litter, not breaking down hedge as short-cut

The field long ago

- ask parents or grandparents if there were more or fewer hedgerows there long ago
- if possible compare a photograph of the area in the past with present
- interview older person about farming practices long ago
- compare crops grown now and then

Language

SPHE: Developing citizenship
Mathematics: Sorting and grouping

The seashore

- A visit to the seashore
- become aware of, explore and discuss elements of the local natural environment
 - beach, rocks, water, tides
 - become aware of elements of human environment
 - roads, trains, harbour, boats, shops, town
 - record experiences and observations using pictures

Plants and animals at the seashore

- observe, discuss and identify a variety of plants and animals at the seaside

Materials at the seashore

- observe and investigate a range of familiar materials collected on the seashore
 - sand, rocks, shells
- describe and compare materials, noting the differences in the colour, texture and use
- group materials according to certain criteria
 - strength, colour, texture, flexibility

Story

- listen to, discuss and record story
 - story about lighthouse

Language

Mathematics: Sorting and grouping
Visual arts: Painting and colour
Music: Song about sea

Exemplar 2: Third and fourth classes

The scheme of work in *Exemplar 2* opposite is designed for use in a rural school in County Cavan. It is largely determined by the need to include a number of geographical contexts in the programme for third and fourth classes:

- a study of the local area. The first four units—‘Homes’, ‘Our own place’, ‘Working on the farm’ and ‘Making our visitors welcome’—comprise a comprehensive local study
- a contrasting environment in Ireland. The urban area of the county town of Cavan has been chosen and has been examined in two units of work: ‘Cavan: our county town’ and in the study on the electricity transformer factory. Any substantial urban area in Ireland could have been used for this unit; for example, equally relevant studies could have been based on neighbouring county towns such as Navan or Monaghan, or a regional centre such as Dundalk with its brewing and port activities
- an environment in a European country. The unit entitled ‘Paris: the home city of our angling visitors’ provides a European context and has the advantage of a relevant link to the experiences of the children as a large percentage of the French tourists to County Cavan come on fishing holidays
- a non-European study. This has been achieved through the unit on ‘Recycling’ in which examples are taken from a number of developing

countries and in the units on ‘Homes’ and ‘Weather, climate and atmosphere’ where a range of international examples are studied. This study also fulfils the requirement to study a global environmental issue.

Other units have been added to cover the remaining aspects of the programme and reflect the strand units of the curriculum:

- a unit designed to familiarise children with some of the natural and human features of the county and Ireland, ‘My county and country’
- a unit on ‘Planet Earth in space’.

Each of the units contributes to the development of the child’s understanding of natural and human environments and many of them provide the context for the discussion of environmental issues on a local or global scale. The detail of some of these units is outlined in *Exemplar 2A* on pp. 54ff. For the purposes of illustration a wide range of possible activities has been included in each unit: *these should be regarded as a menu from which teachers could select appropriate learning experiences for their pupils.*

A school using a scheme such as this one could help to ensure breadth and balance in the curriculum by ensuring that in the fifth and sixth classes a different contrasting environment in Ireland was chosen (perhaps part of a large urban area such as Limerick or Cork) and further new areas in Europe and elsewhere were studied.

Exemplar 2

A possible scheme of work for third and fourth classes

Topics/Units of work	Human environments	Natural environments	Environmental awareness and care
Homes	People living and working in the local area: <i>Settlement: homes</i> People in other lands	The local natural environment Weather, climate and atmosphere	Environmental awareness
Our own place: Ballinagh, Co. Cavan	People living and working in the local area: People and communities <i>Settlement: homes and other buildings</i>	The local natural environment	Environmental awareness Caring for the environment: litter
Working on the farm: a local mushroom farm	People living and working in the local area: <i>People at work</i>	Weather, climate and atmosphere Rocks and soils	Environmental awareness
Making our visitors welcome: local guesthouse	People living and working in the local area: <i>People at work—tourism and leisure</i>	The local natural environment	Caring for the environment: an anti-litter campaign
Paris: the home city of anglers who holiday in our area	People and other lands (Europe)	Features of the natural environment Weather, climate and atmosphere	Environmental awareness
Cavan: our county town	People living and working in other parts of Ireland: <i>People and communities</i> <i>Settlement</i>	Features of the natural environment	Environmental awareness
An electricity transformer factory in Cavan: a factory study	People living and working in another part of Ireland: <i>People at work</i>		
My county and country	County, regional and national centres	Land, rivers (and seas) of my county	Environmental awareness
Weather, climate and atmosphere	People living and working in the local area People and other lands	Weather observations	
Recycling: a global environmental issue	People living and working in the local area People and other lands	Features of the natural environment	Environmental awareness Caring for the environment
Planet Earth in space		Weather, climate and atmosphere Planet Earth in space	

Exemplar 2a

Some sample units of work from a scheme for third and fourth classes

Our own place: Ballinagh, Co. Cavan

Human environments

People living and working in the local area:

- People and communities, Settlement: homes
- family and school communities
 - homes and their locations in village and countryside
 - homes of travelling people on roads outside village
 - services to homes and other buildings
water supply, sewerage, electricity, telephone

People and communities, Settlement: other buildings

- other buildings and human features found in the area, their location and uses

grocery shops, hardware shop, public houses, offices, filling station, churches, health centre, other work-places, farmhouses, farmyards and fields

- people who work in these places
- conservation and change in the built environment
old school reused as garage, changes in shop fronts, new church replacing old one
- materials used to construct homes and other buildings

Natural environments

The local natural environment

- location of village and features of the natural environment
sloping site of village, hills surrounding village, river, lowland area to west
- course of the river into and through the village, and then into lowland area to the west of the village
- flora and fauna of the hedgerows on the hills and along the river
- inter-relationship of natural features and the lives of people

transport: settlement named after crossing point on river (Béal Atha na nEach) bridges over river today

the ruined mill on the river bank in the village and the people who worked there

hillsides used for farming

lowland areas: farming land but sometimes flooded

- local river as a tributary of the River Erne

Environmental awareness and care

Environmental awareness

- flora and fauna of hedgerows, river banks and river
- colours and textures in buildings, streetscapes and path, road and street surfaces
- people altering the environment
changes to shop-fronts in the village work of tidy towns committee removing hedgerows building of new houses
- appreciating attractive places, identifying unattractive places, suggesting improvements

A local environmental issue

- identifying and remedying a local environmental problem: litter

Geographical investigation skills

- investigation skills used in
explorations of hedgerows, river environment survey of shops and work-places investigations of building materials

A sense of place and space

- awareness and appreciation of
people and communities human and natural features
- relative size and location of human and natural features
- links between features
village street, roads, hills river, mill and bridges
- distances and directions between features

Maps, globes and graphical skills

- simple plans and maps of home, school and surroundings
- maps, photographs (and if possible oblique aerial photograph) of village
- graphs and charts (hand-drawn and computer-generated) to analyse and present information
- plotting information about buildings of the village on maps

Integration: History: Local studies, SPHE: Myself and the wider world; Arts education: Visual arts

Working on the farm: a local mushroom farm

Human environments

People living and working in the local area: People at work

- family living on local farm
- people working on the farm: how the farm gives people jobs
- work routine of farm, growing and harvesting mushrooms
- energy and power: how mushroom tunnels are heated
- other farming activities: livestock-keeping
- transport: bringing growing compost and other raw materials to farm, collection of mushrooms by processing firm

Natural environments

Weather, climate and atmosphere

- how weather conditions affect work of farm
need for extra heat in cold weather
need for cooling in warm weather

Rocks and soils

- observe, collect and examine different soil samples in the immediate and other environments
- begin to explore influence of soil and rocks on animal and plant life
physical conditions, soil, water and food supply influencing range of plants and animals

Environmental awareness and care

Environmental awareness

- awareness of impact of black plastic tunnels and green tunnels on the environment
- problems associated with disposal of waste compost

Geographical investigation skills

- investigation skills used to explore the effect colour has on the absorption of heat
why is black or dark green plastic used on the outside of the growing tunnels? (absorbs heat from the sun)
why is the inside of the tunnel lined with a reflective material? (retains heat inside tunnel)
- investigation skills used to examine soil samples from different areas of the farm and the artificial growing medium used in mushroom production
collect and examine different soil samples
sort and group constituent materials in samples
(e.g. rocks, pebbles, sand, plant material)
compare and contrast materials

A sense of place and space

- location of the farm near the village
- location and layout of farmhouse, mushroom tunnels (growing houses)
- relationship of the area to processing centre in neighbouring county
- links with other places: export markets in Britain and the Netherlands

Maps, globes and graphical skills

- simple plans and maps of the farm buildings
- maps, photographs (and, if possible, oblique aerial photograph) of farm
- graphs and charts of output of farm over a period
- use maps and globe to locate processing centre in Co. Monaghan and export markets in Europe

Integration: Science: Energy and forces—Heat; SPHE: Myself and the wider world

These units have been included for illustrative purposes only and suggest a range of possible learning activities for each topic. Further details may be found on page 52.

Making our visitors welcome

Human environments

People at work: Tourism and recreation

- local family-run guesthouse: work of the family and other people employed there
- pattern of seasonal work of guesthouse
- where do visitors come from?
France, Germany, Britain
- what brings visitors to our area?
angling on rivers and lakes, family links, pony-trekking and horse-riding in countryside, historic sites
- people working in other places to welcome tourists
in restaurants, hotels and pubs in village and in nearby towns, in riding stables, in shops, in tourist office in nearby county town

Natural environments

The local natural environment

- features of the natural environment which make the area attractive to tourists
*lakes and rivers
hills and forests*

Environmental awareness and care

Environmental awareness

- appreciating the beauty of the landscape
 - ways in which the local environment could be improved or enhanced
*planting flowers on approaches to village
some road signs in a number of languages*
- A local environmental issue
- anti-litter campaign

Geographical investigation skills

- investigation skills used to
examine types of visitors who come: families, older people, young people
explore and record visitors' reasons for coming to this place: plan and predict best form of advertising to use
investigate in what languages information leaflets might be published
establish forms of transport used by visitors (e.g. touring in car or public transport, cycling, hiking)

A sense of place and space

- awareness and appreciation of
people and communities
human and natural features
- links with other parts of county
other towns and areas which attract visitors
rivers and lakes of the county
- awareness of people from other places
languages of visitors
car registration plates from other countries
locate countries of origin of visitors

Maps, globes and graphical skills

- location of guesthouse on local maps
- use maps to record visitor attractions
- plan information leaflet or computer information display for visitors to area

Integration: History: Local studies; Language: Language awareness and European dimension

Paris: the home city of our angling visitors

Human environments

- People and other lands
- people who come as tourists to our local area: their home region
- location of France, neighbouring countries and Paris
- homes, language, customs, life-style, sports and pastimes of French people: study this through looking at life and home of a specific Parisian family
- famous buildings and sites in Paris
 - *people working in tourism*
 - products we use from Paris
 - *Renault and Citroën cars*
 - *perfumes*
 - farming in France and Ireland
 - *similarities and differences*
 - other French products
 - inter-relationships of French and Irish people
 - *foods we export to France*
 - *things we import from France*
 - *historic links (e.g. Normans, Daniel O’Connell at school, Irish College in Paris, French in 1798)*
 - *languages: borrowed French words in English and Irish*
 - our shared European citizenship

Natural environments

Features of the natural environment

- location of Paris on the Seine
- river Rhine on eastern border of France

Weather, climate and atmosphere

- differences between climate in Ireland and France
- effect of climate on lives of people
 - *homes, outdoor cafés, farming*

Environmental awareness and care

Environmental awareness

- awareness of environments which exist in other parts of the world
- traffic congestion in Paris: how public transport is used to reduce this; the Métro and RER
- problems in old buildings caused by too many tourists

Geographical investigation skills

- examining maps and photographs of the urban or suburban area where the French family live
 - *can the origins of the settlement be observed?*
 - *(narrow, winding streets around church contrasting with newer suburban estate)*
 - *compare shops in photographs with those in Ireland;*
 - *note shops which sell only one type of food*
- investigating ways to travel to Paris
- conduct survey of French produce in local shops

A sense of place and space

- awareness and appreciation of the distinctive features of human and natural environments in other parts of the world
- awareness of names and locations of some European countries
- establishing distances from Ireland to France and Paris

Maps, globes and graphical skills

- maps of Europe and France
- maps of the suburban area where the family live
- graphs and charts of exports from Ireland to France and from France to Ireland
- graphs and charts of population of France, Paris, Ireland, Dublin, Cavan (town and county)
- display results of survey of French produce in local shops

Integration: History: see historic links above; PE: learn to play French boule

These units have been included for illustrative purposes only and suggest a range of possible learning activities for each topic. Further details may be found on page 52.

Cavan: our county town

Human environments

People living and working in other parts of Ireland: people and communities, settlement

- people who live and work in the town (including those who commute from local area to Cavan)
- famous people in the past (e.g. Owen Roe O'Neill)
- basic layout of the main streets of the town
- location and uses of buildings in the town: shops, offices, banks, courthouse, Garda station, hospital, shopping centre, halting site, cathedral, churches, library, bus terminus
- activities in these buildings and the people who work there
- contrast use of buildings
in *Main Street (commercial and retail)*
Farnham Street (offices, courthouse, Garda, etc.)
Cathedral Road (residential)

Natural environments

Features of the natural environment

- name of town coming from An Cabhán—a valley
- identify (on map or aerial photograph) hills around town, river flowing through town
- limestone used as building material
origins of this rock
places where it may be quarried
use of lime in farming
natural features formed in limestone areas (e.g. caves at Marble Arch in neighbouring Co. Fermanagh)

Environmental awareness and care

Environmental awareness

- features of the shop-fronts in the main street
height of buildings, signage, materials used
- older shop-fronts and newer developments
- textures and colours used in the environment
- restoration of older buildings
refurbished courthouse
19th-century mill restored as visitor attraction
- reuse of buildings
large town houses used as offices
church building used as printer's workshop
railway buildings used as cattle market and pharmaceutical wholesalers
- areas which are attractive or unattractive

Geographical investigation skills

- investigation skills used to:
assess and compare flow of traffic on different streets
monitor number of pedestrians at various points
plot uses of buildings in different streets

A sense of place and space

- awareness and appreciation of
people and communities
human and natural features
- relative location of the town and the local area of the children
links town has with other places
roads to other towns
line of disused railway
telecommunications

Maps, globes and graphical skills

- maps, photographs (and if possible oblique aerial photograph) of town
- locate town and its links to the locality of the children and other towns on county map
- graphs and charts (hand-drawn and computer-generated) to analyse and present information
results of traffic and pedestrian surveys
- plotting information about buildings of the town on maps

Integration: SPHE: Developing citizenship; History: Story (of people from local and other communities)

Recycling: a global environmental issue

Human environments

People living and working in the local area

People and other lands

- survey of types of materials disposed of in the bin at home and in the school
- what happens to rubbish in the local area
- examples of recycling from a number of countries
recycling of materials in some developed countries
recycling of materials using simple technologies in developing countries (e.g. re-using wood, metal sheets and paper to make homes, converting metal cans to lamps and stoves)

Natural environments

Features of the natural environment

- effect on environment (e.g. on water and air quality, animals and fish) of excessive dumping and lack of recycling
- how nature recycles materials: animals and bacteria which help to decompose organic materials
- effect of lack of recycling and excessive dumping on water quality

Environmental awareness and care

Environmental awareness

Caring for the environment

- awareness of the types of materials which are treated as rubbish
- differences between recyclable materials and non-recyclable materials
- identifying materials which could be recycled by the family and school
- comparing and contrasting use of materials in the developed and developing world
- organise recycling project in the school or locality
design poster to encourage recycling
collect cans, paper, plastic, bottles etc. for recycling

Geographical investigation skills

- use investigative skills
in compiling survey of rubbish produced at home and school
in analysing rubbish which could or could not be recycled
to discover how people in other countries recycle rubbish

A sense of place and space

- awareness of places in a number of developed and developing countries (i.e. based on the various places in which recycling is studied)

Maps, globes and graphical skills

- use maps to plot location of places studied
- graphs of recyclable and non-recyclable materials
- surveys in classroom of families who have access to recycling collections and those living where this service is not available

Integration: Science, SPHE

These units have been included for illustrative purposes only and suggest a range of possible learning activities for each topic. Further details may be found on page 52.

Approaches and methodologies

Approaches and methodologies

A variety of approaches

The use of a variety of approaches and methodologies will be an essential component of a successful geography programme. This section of the guidelines outlines some techniques which have been found to be particularly suited to geography activities in the primary school. Of course, the circumstances and needs of pupils, teachers, classes and schools will vary and some methods will suit particular topics better than others. The suggestions which follow can provide only general advice which should be adapted and modified to suit individual needs and circumstances.

In some of the sections the examples used are linked to particular classes in the school. However, this is by way of illustration only; most of the techniques described can be used profitably at all levels.

Other methodologies, some of which are suited for use in geography lessons, are discussed in the *Teacher Guidelines for History* and suggestions for the treatment of topics in the strand *Environmental awareness and care* are to be found in the *Teacher Guidelines for Science*.

Irrespective of the approaches selected, children's learning in geography should

- result from a process of enquiry in which children are encouraged to ask questions, to collect information and evidence, to search for patterns and to draw conclusions
- engage pupils in lively, purposeful activity in the classroom and in extensive exploration of the local environment
- build upon the geographical information about their immediate and other environments which children bring to school
- introduce pupils to geographical concepts in a structured and systematic way and provide plenty of opportunities for concepts to be revisited and refined
- arouse enthusiasm and curiosity about the environment
- develop skills of co-operation, communication and problem-solving
- develop an appreciation of and sense of responsibility for environments
- encourage the development of attitudes of mutual respect and tolerance.



Using a wide range of methodologies and approaches is essential for the development of a balanced range of geographical skills, concepts and attitudes.



Learning about places: a framework

Investigating places

The investigation and study of the locality and a range of other places is a major component of the geography curriculum. A knowledge and understanding of the distinctive attributes of various places is, after all, at the heart of geography. However, it is important that the study of places also provides a context in which apparently distinctive aspects of geography form an inter-related whole. The acquisition of a knowledge of human and natural environments and their inter-relationships with each other, the development of geographical concepts and skills and the acquisition of important attitudes will therefore be interdependent elements in the learning process.

The exploration and study of the local area is included at all levels in the curriculum and takes account of these three facets of learning and development. Well-planned local studies will gradually deepen the child's understanding of the peoples and features to be found in the locality; they will provide opportunities for the development of various geographical skills and investigative techniques and help to raise children's awareness of a range of environmental issues.

Although learning about the local area is a central element of the geography curriculum this does not mean that children's knowledge of the world should be limited to areas which they may visit or experience directly. Local investigations will provide an important reference point for the child with which he/she can compare and contrast other places and so will complement the study of a number of locations and peoples in Ireland, Europe and other areas. A broad and balanced curriculum will include a range of places, chosen to introduce children to a diversity of landscape, populations, natural and human features and environmental issues.

What should we learn about when investigating places?

Place is central to geography: understanding where a place is, what it is like and why, is one of the major concerns of the subject. So when children are engaged in the exploration of the locality and other environments they should be encouraged to discover where places and features are located, to study distribution patterns and look for order and reason in them, to identify links and lines of communication, and to search for causes, relationships and changes that occur.

To provide a framework for their investigations of environments, geographers use a number of key questions; indeed some people would argue that these questions provide a definition of the subject. The key questions are outlined in *Exemplar 3* together with a number of further questions that may be derived from them.

All the key questions will be found to be relevant in almost all environments and they can provide a useful check-list when planning a unit of work on a particular place for children. Finding the answers to a range of questions such as these will also help to ensure that the unit of work preserves a balance between establishing *where* a place is located, *what* features are to be found in an environment and the equally important task of investigating *why* a place is as it is.

Exemplar 3

Key questions in the study of places

Key question

Questions to consider

1. Where is this place?

Where is this place?
How does it relate to my home or school?
Is it near a town? or a river?
In which county, country, continent is it?

2. What is this place like?

Who lives here? Where do the people live?
What kind of homes do people live in?
What do people wear?
What foods do people eat?
What do people do here? (their work, leisure, customs and traditions)

What does the place look like?
What natural features are here?
What is the climate like?
What animals live here? What plants grow here?

What is the land being used for?
What features have people made?

3. Why is this place as it is?

How have the natural features been formed?
Why have people built the type of homes they live in?
Why do people wear certain clothes?
Why do people live where they live?
How are people's customs, beliefs, festivals or celebrations reflected in the natural and human features in this place?
How have people made use of their environment?
How has the environment influenced people's lives?
Why do people come here?

4. How is this place changing?

How have people changed this place?
How are they changing it?
Is there any evidence that the introduction of new technologies has changed this place?

Are there new buildings or schemes planned?
How will these new projects alter the landscape or streetscape?
What natural processes are changing this place? (for example erosion, deposition, and weathering)

5. How is this place linked to other places?

How do people move about in this place?
How do people get to nearby towns, villages or other places?
Do people work in nearby towns or cities?

How are goods brought into this place? From where?
How are goods sent from this place to other areas?

How do people in this place communicate with others in the area?
How do people communicate with places outside the area?

6. How is this place different from or similar to other places?

Is the weather the same as ...?
Is the landscape the same as ...?
Is the farming the same as ...?
Do people travel mainly by car? on foot?

7. What would it feel like to be in this place?

What do you feel about this place?
What do you like or dislike?
Why do you think this?
Do you feel that the people living there think that the changes happening in their place are
... good?
... improving the area?
... dangerous?
... likely to spoil the landscape?
... likely to bring jobs to their area?
How do you think the area could be improved?

Learning about the local environment

Opportunities to visit and explore the local environment are essential if the aims and objectives of the geography curriculum are to be achieved.

Exploring and investigating in the local environment

Opportunities to visit and explore the local environment are essential if the aims and objectives of the geography curriculum are to be achieved.

Investigations in the environment, or geographical fieldwork as these activities may be termed, are vital for a number of reasons. Geographical fieldwork in the locality should

- stimulate children's interest in the environment and provide an enjoyable and active learning context
- enable the child to come to know the locality in which he/she lives, to appreciate its features and characteristics and so develop a sense of what is distinctive about his/her own place. This understanding and appreciation of one's own locality is an important aspect of the child's personal development
- encourage a questioning, critical approach to geography in which children are stimulated to ask questions, recognise and investigate patterns, suggest and test hypotheses and so develop critical thinking skills. Fieldwork should allow children to apply, test and extend their understanding of the geographical concepts that they have encountered in the classroom
- provide real situations in which geographical skills are seen to be necessary and relevant, thus encouraging mastery of the techniques and concepts involved
- foster the critical foundation on which a sense of responsibility for the care of the environment is based
- involve group work and co-operative working which encourage the development of many of the social skills that are outlined in the SPHE curriculum. Meeting other people in the environment will, for example, provide opportunities for the child to develop an awareness of the peoples and communities in the locality and their inter-relationships
- provide children with a basis from which they can begin to compare and contrast the features of other environments in Ireland and other parts of the world and the lives of the peoples who live in these places
- be used to integrate many elements of the primary curriculum, including history, science, language, mathematics and the arts with geography.

Preparing for work in the environment

What geography is in my local area?

Before suitable learning activities can be planned for use in the local environment the teacher must decide the extent of the area and the potential it has to offer for the study of geographical features and processes. As outlined in an earlier section of these guidelines (p. 9), the extent of the local area should expand as the child grows older. In the early years much geographical work will be completed in the school and its immediate surroundings but by the time

children are in fifth and sixth classes, local studies will embrace the geography of the county or of a large urban area. This progressive expansion of the extent of the area under study reflects the growth of the child's sense of place and his/her familiarity with a widening range of geographical concepts. It may also be used to ensure that progression and continuity are maintained in local studies within the school. Every area will have some potential for geographical investigation. In rural environments a greater range of natural features may be more accessible but in the areas surrounding schools in both urban and rural settings the results of human activity and human interaction with the environment will be evident in a number of features and processes. The exploration of this relationship between people and their environment should be central to geographical work in the primary school.

Exemplar 4 includes a wide range of questions which may be used to identify and examine the possibilities which the locality offers for geographical study. Conducting an audit of the environment using these questions would be a very worthwhile whole-staff exercise. It would involve both curriculum planning and the identification of the resources necessary to support it. As the areas covered by the audit are discussed certain key features of the area will emerge as particularly suitable for study and a selection of these may then be used to form the units of work for the geography programme at each of the levels within the school.



It is only through visiting and exploring the environment that children can come to know its features, relate them meaningfully to each other, begin to question why the environment is as it is and develop a sense of individual and community responsibility for its long-term care.

Exemplar 4

Conducting an environmental audit

Does the locality have examples of ...

People and communities

- people who live in the area who would be willing to talk to children about their lives in the area and how these may have changed?
- people who are active in protecting or conserving the environment?
- individuals, groups and organisations who enrich the lives of people in the area?
musicians, artists, craftspeople, sports men and women
voluntary groups, sporting and cultural organisations, local teams
tidy towns committees
local and regional development organisations
charities
- people who have come to live in the area from other parts of Ireland or from other countries?
- people who have relatives living in other parts of the world?
- ways in which people depend on one another in the locality?

Natural environmental features

- landscape features?
hills, mountains, valleys, lowland areas
- water in the environment?
places where puddles and rivulets form in the rain
streams, rivers, ponds, lakes, estuaries, seashores
- features formed by erosion and/or deposition caused by water, ice, wind?
places where water eroding banks of a stream may be viewed
places where polished water-rolled stones could be collected
valley shaped by ice, drumlins deposited by ice
rocks eroded by the sea, sand, pebbles and rocks on beach
trees or hedges shaped by prevailing wind
- features created by the interaction of flora and physical features?
peatlands, lakeshore or seashore habitats, examples of plant or animal life
different flora to be seen at various altitudes on a mountain

- ways in which natural features have influenced the lives of humans?
 - effect of valleys and rivers on transport links*
 - effect of soils and slope of land on farming (e.g. tillage in lowland, pasture on steeply sloped land, different crops on different soils)*
 - how homes have been placed to gain shelter from prevailing winds and how shelter belts have been planted to enhance shelter further*
 - influence of the climate on work and lives of people (e.g. importance of weather for tourism, fishing, farming)*
- ways in which people have influenced or used natural features?
 - quarries and the use of stone, sand, gravel or other materials*
 - mines and the use of the minerals or other resources extracted*
 - extraction of turf*
 - hydro-electric dams, water reservoirs and water supply*
 - waste disposal and land-fill sites*
 - farming and forestry*
- places in which weather observations might be made?
 - locations that might allow useful comparisons to be made*
 - locations that might show the influence of aspect or altitude on weather readings*
- places in which to investigate the effect of site on plant growth, rainfall and run-off?

Settlement

- different types of homes?
 - houses, flats, cottages, farmhouses, caravans, mobile homes*
 - settlement patterns: nucleated (e.g. homes grouped in a terrace, square, diamond, or estates) or dispersed (e.g. farmhouses throughout the landscape)*
- sites showing the origins of the settlement?
 - crossroads; ford or bridge at crossing point; rath, fort, castle or other defensive site; monastery or church; square or diamond in plantation town*
- older and newer areas of settlement?
 - older houses and buildings in the central streets with newer houses, supermarkets or shops located on the outskirts of the town*

- other types of buildings?
shops, supermarkets, post office, factories, workshops, offices, churches, schools, hospitals, courthouse, Garda and fire stations, refuse collection sites, places for leisure and recreation
- opportunities to investigate how and why some buildings have been altered, restored or reused?
changes in technology (e.g. opening of new factories, closure of others)
changes in transport (e.g. factory moved from canal side to road side, reuse of old railway station, construction of new roads for heavier traffic)
changes in social habits (e.g. closure of cinema, use of supermarkets rather than shops)
importance of tourism (e.g. restoration and/or reuse of old buildings)
- buildings in which various local and other building materials may be seen?
- areas in which patterns may be discerned in the settlement?
smaller windows and stone used in older buildings
larger windows and modern materials used in newer constructions
three-storey buildings in some streets, two-storey buildings in others
streets which are largely residential while others are commercial
traffic lights used at some junctions but not at others
buildings located above a certain altitude (e.g. to avoid flooding)
homes built below a certain altitude (e.g. to avoid severe weather)
land used for hay or silage-making and tillage in lowland while higher ground is used as rough grazing

People at work

- people who earn their living in various ways?
people working at home
people working in farming, fishing and other primary industries
people working in factories, offices, service industries
people involved in tourism, leisure and recreation
- work-places which children could visit to investigate the work of the people employed there?

- how the people in the locality depend on people in other parts of Ireland and other parts of the world?

raw materials from other places, goods being sold to people in other places

- work-places which can be linked to other employment in the area?

a local factory might create jobs for its workers and provide opportunities for other suppliers and workers

tourist sites may encourage the establishment of souvenir shops, restaurants or filling stations

- the effects which industries, services, tourism or leisure activities may have on the environment?

enhancing the environment in which people live, increasing traffic or noise

Transport and travel

- how people move about in this place and how they travel to and from other places?
- transport infrastructure and communication networks?

roads, bus termini and stops, railways and train stations, canals, airports, ports and harbours, pipelines (e.g. gas pipelines)

postal services, telecommunications

- places where the services available for the movement of people and goods may be investigated?

Environmental issues

- areas in which the built or natural environment is particularly attractive or unattractive?
- areas in which the built or natural environment is undergoing change?
- places in which the effect of human activity might be assessed by children?
- schemes for local environmental improvement?

activities or projects in which children might become involved

- plans or projected schemes in which the advantages of development have to be balanced against the impact which this may have on the environment, flora, fauna and the lives of people?
- people who would be willing to talk to children about some of these issues?

Preparing for fieldwork

- explore and get to know the environment thoroughly
- identify and note potential hazards
- consult
 - principal, board of management
 - policy on out-of-classroom activities and safety statement
 - other teachers
- choose and prepare for the activities in which children will engage
 - prepare work directives
 - consult safety guidelines for science
- prepare the pupils
 - plan and complete preparatory classroom work
 - discuss forthcoming work with children and their behaviour and attitudes in the environment
- inform parents, obtain parental consent
- organise what the teacher and pupils should bring
- ensure adequate supervision
- complete follow-up work
- evaluate the learning experience

Organising fieldwork

Learning in the environment is an exciting and pleasurable activity for children and successful fieldwork can be a deeply rewarding experience for the teacher. While working with children in the environment can raise a number of organisational and safety issues, good preparation and planning, together with well-structured purposeful activities and adequate supervision can help to ensure successful fieldwork which will enrich children's geographical understanding immensely.

Knowing the environment

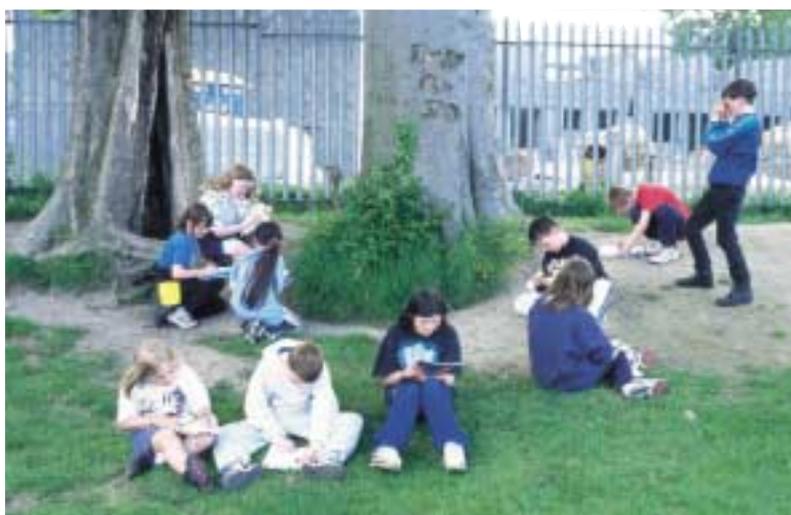
A thorough familiarity on the part of the teacher with the places to be visited and explored is essential. A great deal of very valuable fieldwork may be completed around the school and its grounds and these will be readily accessible to the teacher. However, visits to other sites will also be necessary. Making a number of visits to the area, perhaps in the company of another teacher or a person with local knowledge can provide vital information for the planning of safe and educationally sound activities. The features to which children's attention might be directed can be identified as well as areas which might be much in demand but best avoided.

Identifying hazards

Preliminary visits should also be used to identify dangerous locations and potential sources of danger, all of which should be carefully noted. A wide range of hazards may be encountered. Streets with narrow pavements, roads that carry exceptionally heavy traffic and dangerous crossing points are obvious but rural environments may be equally hazardous. Farmyards, areas near water, cliffs or high ground, and natural environments in which poisonous plants or dangerous animals may be found all pose risks for both children and adults. The significance and nature of these risks will of course vary with the age, experience and mobility of individuals and the class as a whole. Further useful advice on safety issues and the management of outdoor activities may be found in Tony Thomas and Stuart May, *Fieldwork in Action 3: Managing Out-of-Classroom Activities* (Geographical Association, Sheffield, 1994).

Consulting within the school

Teachers should consult the principal (and if necessary the board of management) whenever it is proposed to engage in activities in the environment. The school's policy on out-of-classroom activities should be consulted and provision made for insurance, transport and other requirements. Advice may also be included in the school's safety statement. Further advice may be sought from other teachers who may have completed similar work.



Much valuable geographical fieldwork may be completed within the grounds of the school. The effect of natural processes such as erosion will be visible on walls and paths, the materials used in the construction of the building may be examined and map work and observation skills developed. Several locations may also provide habitats for plants and animals which can be studied in science activities.

Choosing the activities in which pupils will engage

A clear sense of the purpose of the fieldwork is a major contributory factor in ensuring safe and worthwhile activity in the environment. This sense of purpose will be reflected in the well-focused nature of the tasks that children will be required to complete. Work will often be more satisfactory if it concentrates on a limited number of themes, processes or features.

As the sections on the following pages illustrate, fieldwork can incorporate a range of activities and investigations. The selection of appropriate tasks will depend on a number of factors, including the nature of the environment, the theme or focus of the investigation, and the ability, age and experience of the children. Often children's work will entail a number of tasks to be completed at a few specific locations in the environment. Arranging the contents of the children's work cards, directives or booklets so that these locations are clearly delineated will aid in the supervision of pupils in the same way as a series of 'stops' can form a history trail. (The section entitled *Using the environment* in the *Teacher Guidelines for History* will provide further information on this point.)

Consideration should be given to whether all pupils will complete all tasks or whether each group will be allotted a number of different activities, all of which can contribute to an overall study. Generally the former pattern, in which all groups engage in similar work, is best used with younger children and those who have limited experience of working in the environment.

Care should be taken to ensure that the tasks required of pupils do not expose them to danger. For example, observation activities should be carried out from places of safety. It is important too that plant, soil and rock specimens should not be collected *except where absolutely necessary* and then only under the direct supervision of an adult. When designing investigative activities teachers will find useful safety advice in the *Teacher Guidelines for Science* accompanying the primary science curriculum and in *Safety in School Science* (An Roinn Oideachais, Dublin, 1996).

Preparing the pupils

The success of the activities and the safety of the pupils will be enhanced by adequate preparatory work in the classroom prior to undertaking any visit. This work should introduce pupils to some of the features they will investigate and to the concepts and/or skills which they will be using in the fieldwork. Some of the skills to be used, such as drawing, map work or the taking of measurements, might be practised in the classroom and school grounds in advance of work in the wider area.

Working in the environment can provide the context for the development of important attitudes. These can include the children's willingness to obey the instructions of teachers and other adult helpers, the respect they demonstrate for the privacy of others (for example in avoiding excessive noise), the care they show for the environments that they visit and the respect and courtesy they evince towards other pupils and the people they encounter on the trip. Discussing these behaviours and attitudes in advance, together with the need for safety arrangements and rules, will be an important aspect of good fieldwork.

Informing parents

Parents should be given advance notification of any proposed out-of-school activities. Teachers may require information from parents on any relevant medical and dietary details concerning pupils (for example allergies, medical conditions, restrictions on medical treatment, etc.) and contact telephone numbers in case of emergencies. This information should be retained by the teacher in overall charge of the class.

Organising what to bring: check-lists for teachers and pupils

The check-lists overleaf may seem daunting but they are designed to be a practical summary of the equipment that might prove useful during out-of-classroom activities. Some of the items will be used with older pupils only and on all-day visits rather than during short periods in the immediate environs of the school.

Ensuring adequate supervision

Ensuring the adequate supervision of children as they are working in the environment is of vital importance. Given the nature of the observations and investigations which are involved in geographical fieldwork, there will be a frequent need for children to engage in small-group work when exploring the environment. Consequently, a number of adults will often be needed to accompany each class.

Many schools invite parents to aid with the supervision of pupils during fieldwork. If this approach is adopted, the procedures outlined in the school's policy for adult helpers should be strictly followed. Parents who help in this way should be briefed thoroughly on the location to be used and the nature of the activities which the children will undertake. They should be made aware of any hazards that could be encountered and the procedures to be adopted in the event of accidents and emergencies. Parents and other helpers must also be clear about the

names (and perhaps ages) of the children for whom they are assuming responsibility (the wearing of some type of common badge by pupils and adults can help in identification) and they should be familiar with the pupil behaviour which teachers find acceptable. 'Reporting back' locations and times should be clearly understood by all teachers and helpers.

The teacher who is in overall charge of the class should have a written record of the names of pupils in each group and their leaders and should know the location of each group and the activity in which they should be engaged at all times.

If children are working in the environment for an extended period, time for snacks, breaks and the use of toilets will need to be included in the programme of work. Supervision at these times is particularly important as accidents may happen more easily when a learning activity has been completed or when pupils and adults are more relaxed.

Working in the environment: a check-list for teachers

- information on the latest weather forecast
- a list of all participants in the fieldwork
- parental consent forms for each pupil on which medical details and parental contact numbers are recorded
- telephone numbers of local doctors, hospitals, Gardaí, rescue services and your school
- on longer day trips the home telephone numbers of the principal and/or chairperson of the board of management may be useful
- cash and telephone call-card for making calls or a mobile phone
- first aid kit
- list of all helpers and the groups assigned to them
- a detailed programme of activities which indicates where each group should be and what its members should be doing at all times
- activity sheets, work directives or trail booklets for pupils
- maps of the area
- maps, check-lists of pupils' names and safety instructions for helpers
- equipment needed for investigations (e.g. compasses, trundle wheel, plastic containers for specimens)
- spare pencils and erasers
- warm waterproof clothing and strong footwear
- lunch and drink
- some children may require access to medication and, depending on the school policy, this may be held by the teacher (remember to carry sufficient medication in case of delays)
- sacks for litter and refuse
- a rucksack to carry all these bits and pieces!

Investigating the environment: a check-list for pupils

- a clear understanding of the activities which they will undertake
- a clear understanding of the group to which they are allocated and the name of its leader
- school, class or group badge to help with identification in crowded areas
- warm waterproof clothing and strong footwear
- copy of work directive or trail booklet
- map
- pencils (not ballpoint pens) and eraser
- extra paper and crayons to take rubbings and make sketches
- small camera
- plastic containers to collect specimens
- compass and other equipment for investigations
- lunch and drink
- a rucksack to carry items and keep hands free for work

Implementing follow-up work

A programme of work based on the information gained and observations made by the pupils during their outdoor investigations is essential if the full learning potential of this work is to be realised. This work can involve recording, analysing and interpreting the information collected and presenting the findings using a range of media. Information technology can play a very useful role in analysing and presenting data as can the drawing of maps and graphs and the construction of models.

Discussing and comparing the findings of various groups and perhaps comparing them with information collected by groups in earlier years can enrich the process further. For example, traffic counts made by various groups might vary according to the time of the observation while data collected in previous years might show a generally lower or higher volume of traffic. Findings such as these may lead to new questions and can encourage further research and investigation.

Evaluating the learning experience

An analysis of the children's approach to exploring and investigating the environment will reveal much about their understanding of concepts, their mastery of skills and the attitudes they have developed. Much information about the children's learning will be furnished by the follow-up work completed in the classroom but children's interactions and activities in the environment will also be very revealing.

The organisation and management of the activity, its suitability for the age and ability of the group and the extent to which objectives were achieved should also be examined and noted so that the lessons learned may be incorporated into the planning of future investigations in the environment.

Some investigative techniques for exploring human environments

- observing and sketching features in the landscape
- conducting a land use survey
- interviewing people living and working in the area
- conducting an environmental appraisal
- plotting routes
- conducting a traffic survey
- planning, carrying out and evaluating experiments in the environment and in the classroom

Investigating human environments

Using a range of investigative techniques

A number of teaching and learning activities may be used to help children to pose questions about environments, carry out worthwhile investigations and use a number of geographical concepts and skills. A range of those which are particularly suited to the investigation of human environments is discussed in the pages which follow. The teacher should select from these and other possible activities to ensure that children investigate their environments in a number of ways. When implementing these techniques, teachers should also be aware of the advice on safety and other issues contained in the section *Organising fieldwork* (pp. 74–80 above).

Some of these techniques are sufficiently time-demanding to be used as a single activity during one visit to the environment while others could be combined to form a number of tasks in a trail booklet. For example, the completion of a land use survey by children in their local town centre might be the sole focus of one of their visits to the area or the sole task allotted to one group of pupils during a visit. A further visit might involve the completion of a trail which would include map-reading, tasks requiring observation and deduction from visual

evidence, sketching activities and the evaluation of the attractiveness (or otherwise) of various aspects of the areas.

The techniques are suitable for use in both urban and rural areas. While the section which follows explores how these approaches could be applied in the study of human environments, it should be remembered that many of the techniques are also applicable in the examination of natural environmental features. Similarly, many of the techniques discussed under *Investigating natural environments* (pp. 97–115) may also be applicable in built environments.

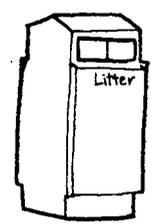
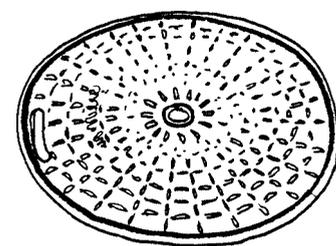
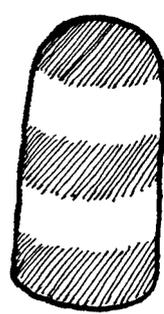
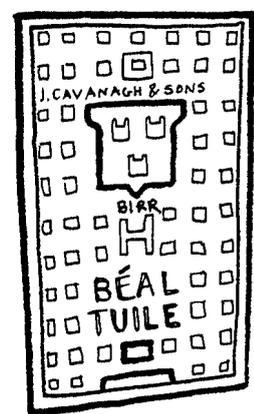
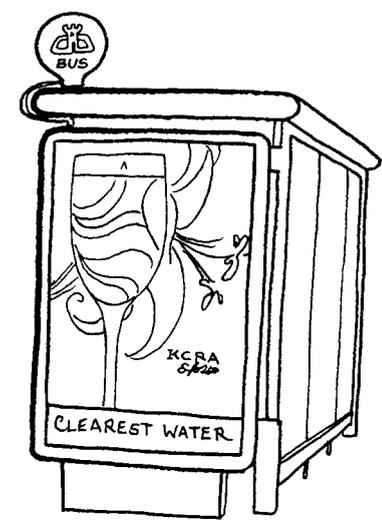
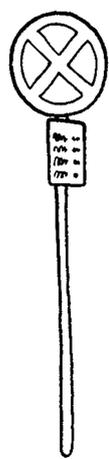
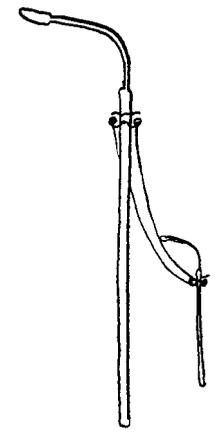
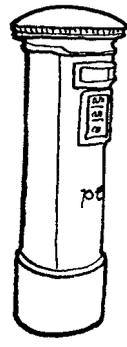
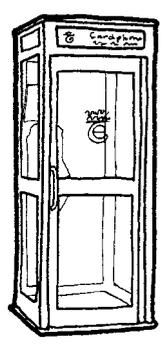
Observing and sketching features in the environment

Encouraging the child to look closely and critically at the elements of the landscape around him/her is an essential requirement in developing a familiarity with the environment. Two elements should be present in this type of activity: firstly, children should be engaged in tasks which prompt them to look closely and observe features in the environment, and secondly, children should be encouraged to analyse and make deductions from the visual evidence which they encounter. These elements reflect two of the key questions of geography: 'What is this place like?' and 'Why is this place as it is?'

A great deal of the significance of geographical information is concerned with the shape, size and relative location of features and so making sketches, drawings and maps will provide an important way of recording and analysing facts about a place. The artistic quality of the sketches is not of great importance in these activities: the emphasis should be placed on careful observation and the recording of useful information. Some ways in which children's attention may be drawn to environmental evidence are described below.

Finding and recognising details and features

Sketches or photographs of features can be drawn on a worksheet or trail leaflet and children should record where these details are to be found. Architectural features such as roof shapes, barge-boards on gables, evidence of trading such as advertisements and large shop windows, metal covers used on water or gas mains and telephone cables in the pavement and many other features can be included, depending on the environment and the particular aspect that is under scrutiny. Finding and recognising these features can provide the first crucial steps in developing the children's observation skills.



'Street furniture' is the term used to describe the wide range of practical and aesthetic items used in built environments. Some, such as seats, railings or flower tubs, are intended to make the area more attractive. Others such as litter bins, notices, street lights and bollards, serve more practical functions. Several, such as bus stops, telephone kiosks, gratings and metal covers, provide evidence of the provision of services. Finding and recognising these features in the environment can provide the first crucial steps in developing children's observation skills.

Annotating drawings

Sketches of groups of buildings or features could be supplied on a worksheet and the child asked to annotate the features marked. For example, in a rural area older children might be presented with a drawing of the fields, river and hills visible from a particular vantage point on a farm and they could be asked to note the different plants and crops growing in different areas, the relative size of fields near the river and on the hilltop, the types of buildings visible (perhaps a number of farmhouses and other buildings or a village in the distance) and transport and communication links (roads, electricity poles, pylons for mobile telecommunications).

Completing sketches

Both younger and older children may be asked to complete the missing elements of unfinished sketches of individual buildings (house, shop, farm building, railway station) or other features in the environment (bridge, wall, road, railway embankment, harbour wall). As well as enhancing pupils' observation this type of activity may be used to encourage children to look at the relative size and location of different elements in the landscape or streetscape. For example, the position and relationship of elements of a building can become apparent: the projection of the roof beyond the wall on an older building to create wide eaves, the larger windows on

the ground floor of a shop with smaller fenestration in upper floors, the relationship of porch, garage and main rooms in a house.

Older children's attention can be directed towards a number of features in groups of buildings (such as those in a terrace or street, in a farmyard, in an industrial estate, in a view of a natural and/or human landscape). They could be asked to recognise common characteristics, the relationship of elements to each other and how these contribute to the character of a place. For example, in completing a drawing of the ground floors and upper storeys of a row of shops and houses along the street of a rural village the relationship of height to usage would become apparent (tall three-storey buildings used as shops and public houses while purely residential properties may be two-storey). The exercise should also foster an appreciation of those buildings (both old and new) that are in keeping with the built environment and an ability to recognise those that disrupt the visual pattern of the streetscape.

Sketching landscapes

In the early stages children's sketches of environmental features will be simple pictures, often combining elements of maps and drawings. Accuracy may be developed by encouraging the child to concentrate on a restricted part of the view or a small area of the environment in question. Children's homes and their immediate surroundings and the areas within and around the classroom and school provide many opportunities for this type of work. Gradually other areas and more extensive views may be attempted and, in order to practise the skills required, children might be encouraged to produce their own sketches of views in photographs and postcards.

As the drawing of more extensive views are attempted in the environment, the older child may be introduced to the use of a viewfinder. At its most basic level this involves using a rectangle to place limits on the view to be depicted. The frame of a window, for example, can be used as a viewfinder, the child attempting to reproduce the scene on his/her paper. The apparent intersection of the sides of the window with the landscape features provides reference points for the child's drawing. Later a card rectangle (perhaps subdivided in four) may be held up in the environment and used to aid sketching.



Using a simple viewfinder to aid landscape sketching.

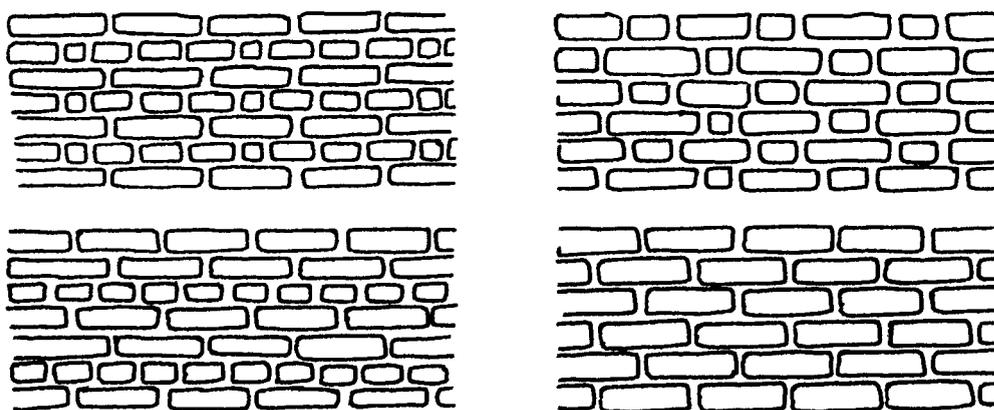


A range of stone wall constructions and building materials: left upper, dry-stone walling; right upper, rubble stone construction; left lower, snecked limestone wall; right lower, Liscannor slates on roof. The patterns and textures created by different forms of masonry help to define the character of a building and landscape and can be recognised by the child.

Using photographs

The use of aerial photographs is discussed in more detail in the section on map work (see p. 98–100) but it is worth noting here that observation skills can be developed by asking the child to pick out particular features in a photograph and then identify them in the environment. In particular, children can be encouraged to find items shown in close-up photographs of small details such as door handles, bars or meshes on windows, gate locks, road signs, bollards, bicycle racks or wall textures (e.g. brick patterns, pebble-dash, patterns in stonework). This activity can encourage children to look closely at details in a familiar environment.

The advent of cheap, disposable cameras makes photography available as a recording technique in a way which would have been beyond the resources of many schools in the past. As children visit and explore an area they can use photographs to record the activities and features observed at certain points and later analyse these images in the classroom. The relative merits of photography and sketching may also be discussed, including the immediacy and unselective nature of the photograph in contrast with the selective and potentially biased nature of the sketch.



Brickwork patterns: left upper, English bond; right upper, Flemish bond; left lower, garden wall bond; right lower, stretcher bond. Like stonework patterns, brickwork varies in pattern, colour and texture and can be used as a way of identifying buildings built at various periods. Close-up photographs of these textures can be included on worksheets so that children have to recognise the building from which the section came. If building work is in progress in the area a construction worker might be asked to explain the relative merits of the patterns in use.

Drawing conclusions

All the suggestions above are primarily concerned with the collection and recording of information about the environment. However, simply recording the features of the environment is but the beginning of the geographical work in an area.

It is essential that children are encouraged to think about the features they see, to look for clues, to recognise patterns and to use the information they acquire to explain why a place or a particular feature is as it is. Annotating sketches and photographs (as described above) will assist in this but posing questions and completing a variety of tasks should stimulate children to look for explanations and causes, to suggest and test hypotheses and to use all the evidence available to them to make deductions.

For example, questions used on trail booklets or in subsequent classroom discussions might direct the child's attention to the similarities and differences between older and newer residential areas in a town. In both areas houses might be arranged in terraces but the older properties might have large gardens to the front while the newer areas may have smaller gardens and off-street parking spaces for cars. What does this tell us about how people moved about in the area in the past and how this has changed? Can any other features be seen which suggest that car traffic is a major concern or even a

problem in these areas? Perhaps streets have been designated as one-way because of heavy traffic or some areas may have been designated as pedestrian zones. Can pupils suggest how traffic and the availability of transport could be analysed?

Land use survey

Children can come to appreciate some of the more important distinguishing characteristics of a place through land use surveys. As its name implies, a land use survey involves examining and recording how an area is used; for example whether it is covered in natural features such as vegetation, rock, sand or water or used for human constructions such as fields, roads or buildings. The information about the use of the area is plotted onto maps, usually using a colour-coded system.

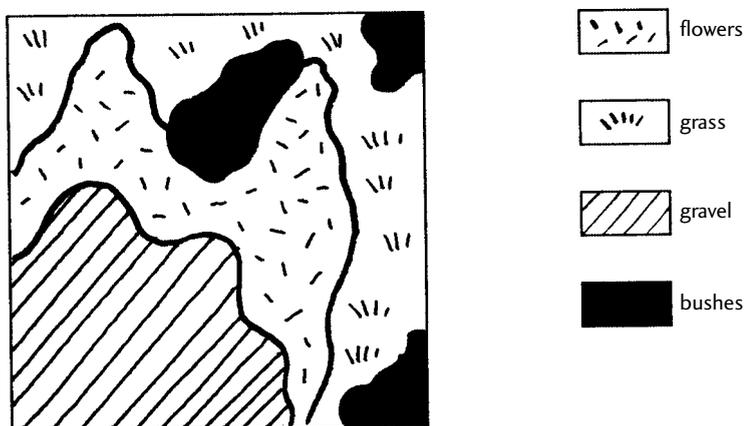
The technique can be adapted to almost any size of area and the categories of usage into which it is divided will vary depending on the nature of the area and the level of detail required by the surveyors.

A simple land use survey that children might undertake could involve plotting the different types of surface to be found in a very limited area of the school garden. A square metre or even smaller area might be marked out using string, and children could record the sections covered by grass, paths and flowerbeds. For younger children it helps if the basic outlines of the different areas are drawn in by the teacher on the blank map and discussion can then concentrate on how the different uses might be recorded using what is essentially a colour key.

Land use surveys can also be completed within a building. Children could explore the interior of the school building and record the usage of various areas on a blank map. Categories of usage might include classroom teaching areas, storage,

administration, heating and services, assembly areas, library, catering and circulation space. This type of exercise can provide a focus for the exploration of the school building and its map. It can also help children to appreciate how the spaces of the building are related to each other. A similar exercise could be conducted in a large supermarket or shopping centre: the location and circulation patterns that emerge can provide the basis for much discussion and follow-up work.

Land use surveys are an ideal tool in exploring environments such as towns, villages and farms. A map of a street in a village or town (perhaps based on a map of scale 1:1,000 or a map drawn by the teacher) can be used by pupils to record the use of buildings and spaces along the side of a street. Initially, recording might be done using words such as 'newsagent', 'supermarket', 'post office', 'house', 'chemist', 'empty', 'school', 'church' and 'park', but as in other surveys the need for categorisation and shorter labels or the use of symbols and/or colours will soon become obvious. These can then be appended to the diagram in the form of a key. The various uses of different areas of a farm could be recorded in a similar way: the different types of crops grown in fields, woodland, hedgerows or uncultivated land, and areas used for transport, the housing of animals or storage.



A land use survey of a section of the school garden. The various uses – paths, flowerbeds and grass – have been colour-coded.

Some suggestions for interviews and surveys

- how people travel in an area
 - where people go
 - how often they go there
 - how far they travel
 - kinds of transport they use
 - difficulties they encounter (e.g. frequency of service, delays, access for disabled, parking)
- the disposal of waste in the area
 - how people dispose of their own waste now
 - how many recycle waste
 - how many would be willing to engage in recycling
 - what initiatives would encourage them to recycle waste

The real strength of this technique lies in the range of skills and concepts which it helps to develop. Map-reading skills are essential to the process, as is the ability to orientate a map when moving around in an environment. Skills of observation are also developed as the child is required to examine often familiar areas in a more focused way. As well as providing raw data for the compilation of graphs and charts, these surveys can lead to the development of skills of analysis. The need for classification will arise as the categories of shops and other buildings in a street or on a farm are determined. Older children may also be introduced to the formal categories of land usage that are used in professional geographical surveys.

Surveys become even more useful when a number of them can be compared. This enables the child to come to a deeper appreciation of the distinctive features of particular areas. For example, completed surveys of a number of streets in a town may reveal quite different usage patterns, such as the predominance of commercial activity in some while others are largely residential. Similarly, a survey of a farm on which most of the land is used for grazing will show a marked contrast with one completed on a largely arable holding. Identifying such patterns can lead children to speculate on their causes and perhaps to suggest where facilities might be lacking or land use improved, for example the lack of a supermarket in an estate or the possibility of creating a wildlife area on a farm.

Land use surveys are particularly valuable in that they encourage children to ask and answer a number of key geographical questions, including 'What is this place like?', 'Why is this place as it is?', 'How is this place different from or similar to other areas?' and, if survey data is collected over a period, 'How is this place changing?'

Interviewing people who live or work in the area

Learning about the lives, concerns and attitudes of the people who live and work in a place is a further important aspect of exploring and getting to know the area.

Two approaches may be used in this type of activity. At times the teacher may identify individuals who would be willing to talk to a class or group about their work, perhaps in the classroom or, alternatively, in their work-place. These visits and interviews can be very rewarding experiences for both the child and the interviewee but they require much careful preparation. The use of this approach is discussed in detail in the *Teacher Guidelines for History* and need not be repeated here: it is sufficient to note the absolute importance of the careful selection and briefing of the interviewee and the need for adequate preparation with the children in advance of the visit.

More suggestions for interviews and surveys

- the significance of an urban centre
 - why people come to this street or centre
 - how often they come
 - how far they travel
 - the range of shops or offices they visit or use
 - the shops or services they would like to see in the area
 - the aspects of the area they do not like
- how people spend their leisure time
 - where people go for leisure in the area and beyond
 - how often they go there
 - what activities are available there
 - how facilities might be improved

These interviews, particularly if they include visits to the work-place, can significantly enhance the child's understanding of the activities and conditions involved in particular occupations. The activities and operations in a manufacturing industry, for example, may be used to encourage children to appreciate how the work of individuals is very much dependent upon that of others in the same factory and in supply and service industries both locally and further afield. If the study is based on a farm or factory that exports or imports goods or raw materials to or from another part of the world this can lead on to the examination of transport routes and schedules, the development of language awareness and a consideration of lifestyles in a distant environment.

Although interviews will often take the form of a talk and/or demonstration followed by a question-and-answer session they can also be used for the purpose of conducting a survey. In this case children ask a large number of people certain predetermined questions about a particular aspect of their lives or the place in which they live or work. The activity can be applied to a wide variety of topics and issues.

Like longer interviews, surveys require careful preparation but they provide an excellent opportunity to learn and apply geographical investigation skills. Children should be encouraged to think about the issues that might arise, to suggest hypotheses, to draft and test questions and to analyse the data collected so as to discern patterns and draw conclusions. This need not be limited to older pupils: simple surveys can be conducted among the pupils in the school and through questioning parents and other adults at home. Older children will, however, become more aware of the need for balance in the people interviewed (for example both older and younger people) and the effect that the time of day or the location of the interview may have on the results.

As in the case of all fieldwork, children should conduct these survey interviews under the direct supervision of an adult and the opportunity should be used to reinforce the importance of good social behaviour and respect for all those encountered. Teachers should also ensure that the location at which surveys are conducted does not obstruct the work or activities of others.

Conducting an environmental appraisal

Children's attitudes towards their environment are an important aspect of their sense of place. Conducting an environmental appraisal can help them to look critically at their environment, to evaluate and express their opinions concerning it and to become involved in the discussion of environmental issues relevant to their lives. In this way children may be encouraged and empowered to become active in the conservation and enhancement of the environment and in the prevention of environmental damage.

Activities involving environmental appraisal may be used at all levels in the school. At its most basic level the appraisal will involve simply identifying aspects of the environment which children find attractive and unattractive. On a walk or trail in the school grounds, for example, children might be asked to label sites as 'nice' or 'nasty' and record their judgements in the form of a 'happy' or 'sad' symbol next to a sketch or drawing. Older children can be given a number of descriptive words or pairs of contrasting words for each site from which they choose the most appropriate. They can also assess the site under a number of criteria, scoring each one as 'poor', 'fair' or 'good'. In all cases children should be encouraged to discuss and justify the reasons for their evaluations, to suggest how places might be improved and, if possible, to become involved in practical schemes for environmental enhancement.

Plotting routes and investigating connections

Understanding where and how various features within an environment are linked to each other is closely related to the child's locational awareness and his/her sense of place. Exploring the links that exist within an area and the connections that the place has with other areas should form a part of a local study as children seek answers to key questions such as 'What is this place like?', 'How is this place linked to other places?' and 'Where is this place?'

A very practical way in which to tackle this work is to look at the routes which pupils and others use to move around in the environment. While not strictly a fieldwork technique (much of the work will be closely related to or achieved through map work) the examination and plotting of routes will involve some work in the environment and will significantly enhance children's familiarity with the shape and spatial qualities of the locality.

With very young children the routes to different areas within the classroom may provide the starting point and this can then be extended to discussing how one could get to the school office, the store room, the hall or the entrance. Infants will also enjoy following string routes. These are short journeys around the school (or a section of it) marked with coloured string (or, alternatively, a series of coloured paper footprints). Ribbons or other markers can be attached at a number of points. At each of these a task has to be completed: for example, a picture might have to be copied or a rubbing taken of an area on the floor or wall which is marked with masking tape. The pictures and rubbings collected by the pupils can then be mounted in sequence in the classroom so that the features and the order in which they were encountered may be discussed.

Discussing routes to places within the school building and yard with first and second classes can help children to appreciate how the area is used by themselves and others. Common routes can be plotted on a simple map (partly iconic maps might be used) and alternative routes might be considered. Examining the most commonly used routes within the building and to the exterior can show the sections of corridors where routes are concentrated and where overcrowding occurs. This may also explain several other features: why people want to place notices along this section of corridor and not in other areas, why the floor is always dirtier

there and why coats or equipment left untidily in this area cause so much disruption!

A similar exercise may be undertaken with third and fourth classes using a map of the locality. Routes used by the children and their parents might be plotted on the map and interesting comparisons made between the routes followed when travelling by car, by bus, on a bicycle or on foot. Plotting unofficial routes and short-cuts can reveal interesting patterns. Completing trails involves following predetermined routes in the environment and children might be encouraged to draw up their own trails for younger children or for visitors to the area.

Older children should also become aware of the locality as a point on a route to other places. Children in fifth and sixth class will be able to distinguish between those transport links that are through routes (i.e. those that neither originate nor terminate within the area) and those that are for local use only. For example, the main road outside an estate may carry traffic through and from the area while the estate roads (or by-roads and lanes in a rural area) will be used exclusively for journeys which begin or end in the area. These roads could be identified through map work initially but they could then be examined and compared on field trips or in trail exercises. Many contrasts may be identified: the roads will vary in width, bends and sharp corners will be less prevalent on the major road, traffic

lights and direction signs will be present on some and not on others. These contrasts will be particularly evident in expanding urban and suburban areas and in rural areas where road improvement schemes have been completed in recent years.

The direction of through routes and the places to which they lead should also be established, either from maps or from road signs encountered in the environment. Bus, train and other route maps should also be examined to determine the links that the locality has with other areas, and the distances to these places should be established. Distances need not be measured solely in units of length: the time taken to reach another place is just as relevant a measure of the remoteness or proximity of a place and may carry more meaning for the child. A signpost bearing correctly aligned direction arrows to a number of places outside the area could be erected in the classroom or in the school to record the children's findings.

Traffic surveys

Counting and analysing the numbers and types of vehicles that people use to travel within and through an area can be readily undertaken by children. Like other surveys, traffic counts draw upon a number of skills, including those connected with the collection and presentation of data. Children can be taught to use tally marks during the observation period. They should agree upon a categorisation of vehicle types

bus	car	van	lorry
///	 ///		///

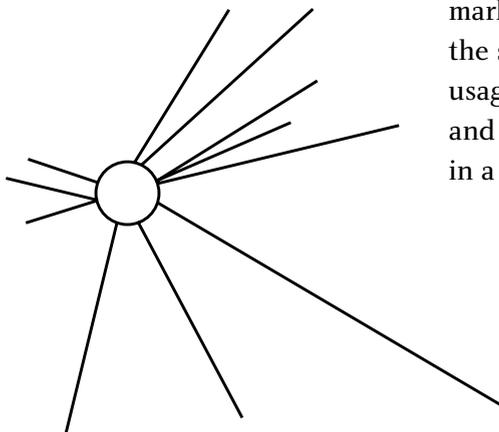
Above, using tally marks to record vehicles (each completed 'gate' representing five items). Exercises such as these can provide an ideal opportunity to develop computer literacy skills, especially those involving the use of data-base and graphics programs.

and the raw data can then be presented using tables, graphs, pictograms and pie charts drawn by hand or using a data-base and graphics program on a computer.

Work on data collection and presentation may involve the proposing and testing of hypotheses and the analysis of the information amassed. Surveys collected at different times of the day and at different locations in the area could be prepared and reasons sought for the differences noticed. The effect which the varying frequency of traffic has on other aspects of the environment might also be noted: the places and hours in which clearway systems or bus lanes have to be implemented, the installation of traffic lights at some junctions and not at others, the effect the density of traffic can have on the speed of vehicles, the noise experienced in the area and the times at which newspaper or other vendors concentrate their business. Schools in both urban and rural areas can carry out these surveys. In rural areas the traffic flow may be influenced by work patterns, by deliveries to a local milk-processing co-operative, factory or market or by the journeys people make out of the area to go to work in a nearby town.

The results of traffic surveys may lead to further investigations designed to clarify the reasons behind some of the patterns noticed or to suggest solutions to problems. For example, a follow-up survey at a peak congestion time might seek to establish the numbers of vehicles used by one, two, three or more passengers and the results might demonstrate the relative lack of efficiency of cars versus buses.

Traffic surveys need not be confined to vehicular traffic but may also include pedestrians, and older children might record the results on time and distance charts. These might be used to establish the extent of the area from which people come to a particular service centre. For example, children might interview the people coming to the local post office or shop to find out where they have come from and the length of time their journey has taken. These journeys may then be plotted as scaled lines radiating out from a central point and the extremities of these lines would mark the boundary of the area served by the shop or post office in question. The usage of parks, libraries, swimming pools and other facilities could be examined in a similar way.



Scale 1 cm : 100 m

Plotting distances people travel to an amenity or service centre

Experiments in the environment

The investigation of human environments can provide opportunities for scientific investigations. For example:

- samples of the building materials used in the environment can be tested and sorted using criteria such as hardness, texture, colour, etc.
- noise levels can be examined. One child can play music on a tape recorder while his/her partner walks away until the sound can no longer be heard. The distance walked is measured and recorded. When repeated at a number of locations the distances recorded can give some indication of noise pollution and environmental quality
- air pollution may be examined. Pieces of kitchen roll or coffee filter papers smeared lightly with petroleum jelly can be attached to jam pots and placed in a number of locations for a few days. Particles will be trapped on the filters and comparisons can be made between filters sited near busy roads, construction sites, open areas and residential estates.

Some investigative techniques for exploring natural environments

- recognising and examining features in photographs
- using simulations and models
- observing and sketching features in the environment
- conducting experiments and investigations
- keeping a wildlife garden

Investigating natural environments

Further investigative techniques

As mentioned earlier, there is no strict division between the techniques which may be used in the study of human environments and those suitable for studying natural environmental features. Many of the approaches described above under the study of human environments are equally applicable here. This section of the guidelines includes a number of further approaches which are particularly suited to the exploration of natural environments, but in the main it will demonstrate how some of the tools discussed earlier under the study of human environments may also be applied to natural features. This section should therefore be read in conjunction with *Investigating human environments* (pp. 81–96) and with the important advice on safety and other issues contained in the section *Organising fieldwork* (pp. 74–80).

What should the study of natural environments include?

Children's investigations of natural environmental features should seek to achieve three broad aims:

- to enable children to recognise and identify common physical features
- to develop children's understanding of how elements of the natural environment have been formed and how they may change
- to encourage children to appreciate and investigate the inter-relationships between natural features and the lives of plants, animals and people.

The work to be completed on natural environments is described in a separate strand of the curriculum but this does not imply that the study of natural environmental features is to be divorced from children's explorations of human environments. It should be remembered that few, if any, entirely natural environments exist in Ireland. The influence of human activity is to be found in virtually every part of the country. Some schools may be situated where specific natural environments are available for study, for example, they may have ready access to a peatland or a rocky seashore or a remnant of a natural forest. The opportunities presented by the flora, animals and physical features of these places should be exploited.

However, most schools will find that their locality includes examples of individual natural features rather than an extensive natural environment. These may include features such as a hillside, a rocky outcrop near farmland, a river, a lake or a pond. It should also be remembered that many natural processes may be observed in environments that have been shaped by human activity but recolonised by nature, for example a hedgerow, an old graveyard, part of a park or a piece of waste ground. So the investigation of natural environmental features should form an integral part of the exploration of the local environment at all levels in the school. Studies of the locality, a contrasting place in Ireland, a European environment and an environment in another part of the world should also incorporate, wherever possible, work on natural environmental features.

Recognising and examining features in photographs

The development of children's concepts of natural environmental features is often less well developed than their understanding of the human elements of the environment. A number of factors contribute to this, including the inconsistent way in which we use terms (for example the word 'hills' may be used to label features others would refer to as 'mountains'), the scale of the features involved and the fact that the processes which create natural features take place over such a long period that they have little meaning for children.

Collecting, labelling, displaying and examining a wide range of photographs of natural features can play a crucial role in helping the child to acquire and refine his/her concept of environmental features. General and specifically geographical magazines, holiday and travel publications and newspapers can be excellent sources for these illustrations and when mounted in classroom displays they can become the focus for interesting discussion from infant classes onwards. These discussions provide the opportunity for the teacher to introduce a range of vocabulary, including both the names of the features (river, lake, pond, etc.) and of their constituent aspects (bank, bend, shore, etc.).

Aerial photographs can play a very enriching role in the investigation of environments. Good oblique aerial photographs of the locality can give the child an overall impression of the topography of the area. The relative location of large features such as hillsides, rivers, hedgerows and forests can be more readily understood and the links between these features and human activity will be clearer.



Good oblique aerial photographs of the locality can give the child an overall impression of the topography of the area – an essential requirement if the child is to understand the way in which large-scale features may have influenced the shape and nature of the landscape. (Based on *Ordnance Survey Ireland* by permission of Government Permit No. 6768.)

This overall impression is almost impossible to achieve on the ground and yet it is crucial to the child's understanding of the way in which large-scale features may have influenced the shape and nature of the landscape. For example, younger children who trace the route of a stream on a photograph might appreciate for the first time that the stream they see outside the school is the same stream that they cross over on the bridge at the end of the village. As larger areas are explored more complex relationships may be examined. The sloped nature of the streets in a village located on a drumlin hillside may be revealed and explained in a photograph. Similarly, a photograph can explain to older children, much more readily than any other means, how flat land and a suitable crossing point on a river may have influenced the siting of a village at a particular point in a mountain valley.

As with the exploration of human features, children should be encouraged to look closely and critically at the natural features depicted in photographs and to identify patterns: where the land is sloped and where it is flat, the areas where trees do or do not grow, the relationship between surface features such as rock, water and soil and the plants and animals found there, the places where people have built or the areas they have farmed or have avoided. Once these patterns have been established then children should be encouraged to speculate on the reasons

behind their existence and to investigate further. Explorations in the environment, using some of the techniques described in the remainder of this section and in *Exploring human environments*, could follow. In this way the examination of aerial photographs can provide a focus for explorations in the environment as well as their more common usage in map work.

Using simulations and models

Simulations and models can be used to illustrate and investigate the way in which many natural processes shape the landscape. Using common materials, a model landscape or section from it can be created and the effects of elements such as running water observed. Valuable lessons can be gleaned from these activities, particularly if children are encouraged to observe, compare and record the changes they see and if the opportunities offered for language development are exploited. A range of possible models and simulations are included in *Exemplar 5* which follows on pp. 102–104.

However, simulations need to be treated with care. While it is valuable for children to be able to see the effects of a process it should be stressed that the scale of models (for example a model of a river valley) is not accurate and the rate at which the processes take place in the model is many times greater than that which occurs in a natural environment. Furthermore, it should not be assumed that children who see processes in action in the artificial

context of a model can transfer this knowledge readily to features in the environment: the links can be tenuous and the model, by eliminating many extraneous factors, can give a somewhat unreal notion of the way in which a landscape feature is formed. Therefore, simulations and models should be used in conjunction with explorations and investigations in the environment and not as substitutes for outdoor activities.



Making a model of a street can integrate mapwork, designing and making skills and construction activities. A large-scale base-map can be drawn. Photographs and drawings made in the environment can be referred to as simple models of buildings are constructed and decorated with appropriate finishes. Many spatial relationships will be revealed as the final model is completed.

Exemplar 5

Modelling natural processes

Weathering, erosion and deposition

Rocks and soils at or close to the surface of the Earth are changed in a number of ways. *Weathering* refers to processes which break up rocks or other materials. It may be caused by mechanical means (e.g. cracking caused by heating and cooling or by the freezing of water), by chemical means (e.g. the dissolving of limestone rock) or by biological factors (e.g. the roots of plants cracking or breaking up rocks). In practice all three types of weathering may occur together.

Erosion involves both the breaking up of material through weathering and the moving away of the resulting debris. Some of the most common occurrences of erosion in Ireland are caused by the action of running water and the sea, but erosion may also be caused by wind and moving ice.

Deposition occurs where debris which has been eroded from a surface is dropped elsewhere: for example, silt and sand eroded by a river may be dropped further downstream as a river beach.

The activities suggested below include a number of ways in which simulations and models can be used to explore how some of these natural processes shape or change the environment.

Rivers and mountains

From the earliest years children can be introduced to much of the vocabulary of physical features through their play in the sand box. Mountains can be made (and 'climbed' by toy figures), valleys can be marked out and water can be seen to flow down the slope.

This can be made more effective by creating a model landscape using a large rock, sand, gravel and soil on a large wooden tray in the school yard. 'Rain' can fall on the mountain from a watering can and the results can be observed. The running water will wash away soil and sand, the rock will be exposed, a valley will be created in which water will flow downhill, the water will flow around obstacles and some of the material it carries will be deposited in the lower reaches of the tray. All these events can become rich sources for language development.

Water eroding and carrying material

The effect of the amount of water flow (its discharge) and the gradient down which it flows on the amount of material eroded and carried by water can be examined using a model river valley. In a piece of guttering raised at one end, some sand and gravel can be spread. A bucket is placed at the lower end to catch water and the eroded material. Water from a hose can be allowed to trickle down the 'river bed'. Children can then record which type of material is moved first. This model has several possible variables for children to investigate: the effects that increasing or decreasing the flow of water may have, the effect of lowering or raising the gradient and the effect of narrowing the channel (by inserting an obstruction in Plasticine).

The presentation of the results of this investigation should be followed by discussion in which children should be encouraged to extrapolate from the model to the real environment. For example, if a higher discharge moved more material in the gutter does this lead us to expect changes in a river's action following a storm?

Erosion and plant cover

The erosion of soil and other materials can be greatly exacerbated by the removal of plant cover through deforestation or the ploughing of land. This can be investigated using model hill landscapes.

Hills may be created using potting compost on wooden trays. One of these can be left bare while another two are planted all over with cress seeds. When the cress has grown sufficiently to produce a strong cover one of the hillsides can have its cress crop cut, simulating the removal of plant cover but not of the roots. 'Rain' from a watering-can then be poured over the hillsides and the results observed. Soil unprotected by roots or plant cover will be eroded most rapidly, the hillside where leaves have been removed but the roots retained will erode less rapidly while erosion should be minimised on the fully protected hillside.



As with other modelling exercises, discussion both of the way in which the exercise might be conducted (including the need to control variables) and the implications of the results for our understanding of the environment, should play an important part in the activity. For example ways in which the effect of human activity could be minimised (such as ploughing across rather than along the slope) could be explored while the dangers of deforestation in equatorial areas will be obvious.

Weathering

The effect of weathering can be examined using samples of different natural and other materials such as clay (modelling clay), chalk, limestone, granite, slate and brick or tile (baked clay).

Weathering by water penetration and chemical action

Samples of the materials may be soaked in water. Bubbles of air will be seen escaping from some of the materials and the height of the water when the sample is initially immersed and some time later will vary. This change will give an indication of the porosity of the material.

Left for several days in the water, some of the materials will dissolve and some changes will be observed in the shape of the samples. If desired, the process can be enhanced by the addition of lemon juice (a weak acid replicating the mildly acid nature of rainfall). Drops of lemon juice can be applied directly to dry samples of the materials and fizzing will indicate a chemical reaction.

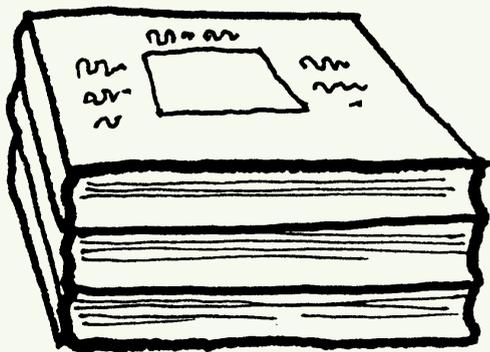
Weathering by freeze-thaw action

Samples of the materials may be soaked and then placed in plastic containers in the freezer. Thawing will reveal that pieces of the materials have been broken off or cracked, and if the experiment is repeated with the same sample a number of fragments will be produced.

Both of these activities should be closely linked to observations in the environment. Areas in which broken pieces of rock (scree) are found at the bottom of a cliff, wall or large rock can indicate that weathering has taken place. Flaking brickwork, broken paths, cracked flowerpots and the deterioration of road surfaces or the school yard during frosty or snowy weather (particularly where water is allowed to lie on the surface) illustrate these processes at work.

Abrasion of materials

Weathered material which is then transported by water (or ice) is further eroded as movement occurs. Fragments of rocks and other materials are worn by colliding against other fragments and the river bed or seashore. This means that the pebbles found in the course of a stream or at the beach are rounded, in contrast to the sharp jagged material which is produced by weathering.



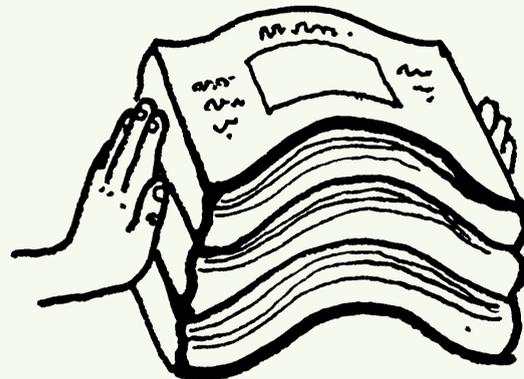
Small hard stones, an irregular piece of chalk and some water can be placed in a strong, sealed container and then shaken vigorously. When allowed to settle, fragments will be seen in the container and some of the jagged corners will have been removed from the chalk. As with the other models, the links which the activity has with the environment should be explored: indeed the experiment may have been prompted by the observation that samples taken from watercourses tend to be smooth.

Deposition

The deposition of sand and other material to form a delta can be illustrated in the following activity. A landscape is modelled in a tray or aquarium using a large rock, sand, gravel and soil as before and a pool created at one end of the tray or tank. A gentle trickle of 'rain' is allowed to flow down the landscape and as it does so the deposition of sand in a small delta will occur as the water enters the pool. A transparent aquarium allows this to be seen even more clearly.

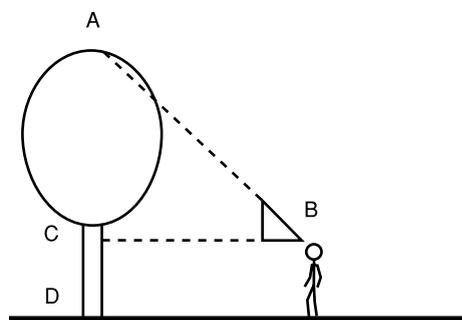
Mountain-building

The creation of fold mountains by earth movements can be modelled using layers of coloured modelling clay (or layers formed by thick paper, foam and felt) with wooden blocks on each side. The application of pressure on the blocks or directly on the layers will illustrate the folding of the mountains.



Observing and sketching in the environment

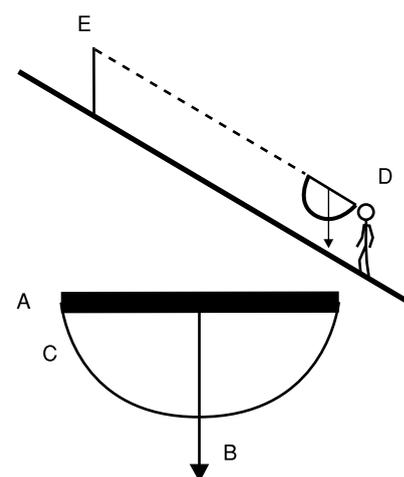
The use of this technique and its development through the primary school years have been fully discussed earlier under *Investigating human environments*. Observing and drawing natural features will also be an important activity in fieldwork. Recognising features in the environment and completing sketches of them should help in refining the child's concept of the features involved and, if locations and examples are chosen carefully, the child may be encouraged to observe and record how some features are formed. For example, the effects of weathering caused by physical processes (such as heating and cooling) and the growth of plants may be recorded as they



Measuring the height of a tree: Using a large isosceles right-angled triangle (for example a blackboard triangle) the observer walks away from the tree until he/she can sight the top of the tree A along the hypotenuse of the triangle held at eye level. The observer's distance from the tree C-B is equal to A-C, so to calculate the height of the tree add the observer's own height C-D to the length of C-B.

are to be found on the headstones of a graveyard; the gently sloping inner curve of a stream with its deposit of sand and gravel and the undercut outer bank opposite may be recorded in a simple, annotated sketch; and both sets of features should lead to a discussion of the weathering, erosion and deposition processes which are in evidence.

The development of landscape sketching will provide many opportunities for language development and should also involve the use of more accurate measurement. Simple equipment and basic mathematics may be used to measure the heights of trees, hedges and other features, the width of streams, the speed of water flows, the temperature in various locations and the slope of land.



Measuring the angle of a slope: Fix a cardboard tube A and a plumb line B to a blackboard protractor C to make an improvised clinometer. Place a pole E near the top of the slope and mark the observer's height on it using a ribbon. Sight the marker from D using the protractor and sighting tube. The number of degrees away from 90° indicated by the plumb line will be the angle of elevation and hence the slope.

Exemplar 6

Water in the environment

infants to second classes

Where does the water go?

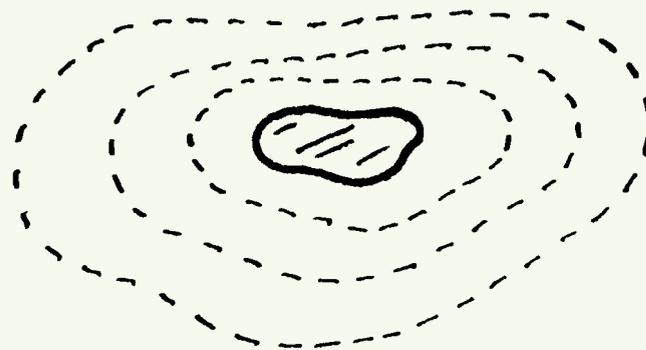
This can be a very common question on a wet day in an infant classroom and the interest it signifies may be capitalised upon. Dressed appropriately, children will relish the opportunity to watch water falling and splashing on roofs, yard surfaces, paths and grassy areas and gushing strongly from downpipes and gutters. Even just a few minutes of observation in the environment can provide the basis for friezes and drawings of the downpour and opportunities for much language development (clouds, rain, drops, shower, roofs, gutters, gratings, drains). Discussion can also refer to the drainage of the water into the local stream. If this is visible near the school so much the better.

Water on different surfaces

From the classroom window younger children could be asked to observe and record in pictures what happens to the rain on various surfaces or different groups of children could replicate rainfall using a watering can and record the results. These can be compared. Why does the water seem to disappear when it falls on the grass? Does it disappear when it falls on the path? on the asphalt? on the roof? on the flower bed?

Puddle maps

What child doesn't like puddles? But how many have traced their disappearance? Following a heavy shower puddles may collect in some parts of the school yard. Thick heavy chalk may be used to outline the edge of the puddle and as the water evaporates the edge of the puddle will be seen to retreat from the chalk line. The new edge may be marked and over several hours successive puddle edges may be chalked on the yard producing a map of the retreating water. The series of concentric outlines may be recorded in a sketch (or photograph) or, if size permits, in a full-scale traced drawing of the puddle map. This activity can be an ideal complement to scientific experiments on evaporation: for example, if the observation is repeated on different sides of the building can any variation (such as that caused by shadow, or sunshine) be noted?

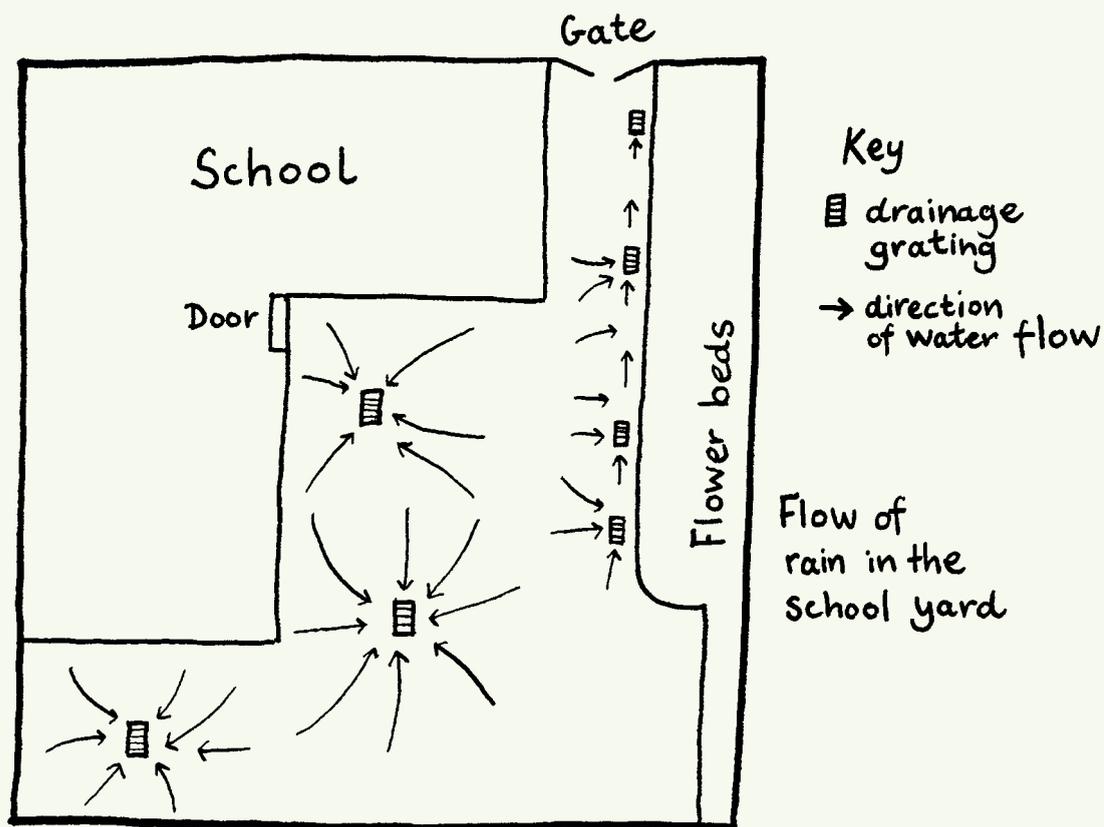


Map the water

The school yard or a portion of a street may provide opportunities for some simple investigation into the direction in which water flows in the area. Watching the action of surface water carefully in a number of locations on a wet day may permit children to see that particular sections of the yard drain into gullies at certain points or that the water forms rivulets that flow from the higher parts of the yard to lower areas.

In a street, water will be seen to run off pavements into gullies and from the centre of the road to its edges. Over the length of a street children in second class will be able to observe that the water flows down both sides of the street in the same direction and this may make them aware of the slope for the first time. If the rivulets in the yard, pavement or street are plotted on a map the beginnings of a local drainage pattern may emerge.

Older children in third to sixth classes may extend this type of work to look at the drainage pattern over a number of streets in an area or over the fields in a farm, and when plotted on a composite large-scale map the drainage pattern for the area can be established. In some urban areas the confluence of several drainage networks may in fact be linked to a river now concealed in large drains.





Measuring the depth of a stream

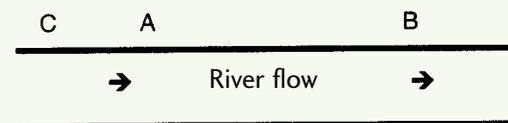
If a very small and shallow stream is under investigation then it may be possible for older children to stand in the watercourse and measure the depth using a metre stick. The depth should be measured at a number of points across the bed of the stream.

A bridge may be used to take depth readings. From the bridge lower a weighted line on which coloured ribbons have been tied at fixed intervals. As the weight bottoms, an observer on the bank can record the number or colour of the ribbons no longer visible above the waterline.

Some schools may have access to a bridge where the local authority or fishery board has placed a depth indicator so that readings can be taken from a distance. If these are on different arches of the bridge comparisons of the depth across the stream may be made.

Measuring the speed of flow

Place two markers, A and B, alongside the river a measured distance apart (e.g. 5 or 10 m). An observer stands at each. Throw or drop a float (of organic material such as orange peel) into the water at C upstream of A.



A calls out when the float passes his/her observation point and a fourth child starts a stopwatch. B calls out when the float passes his/her point and the watch is stopped. Three to five attempts should be made so that an average speed can be calculated, and occasions when the float catches on the bank should be excluded.

If C can be placed on a bridge over the stream then it may be possible to drop the float near the side of the stream and in the middle of the stream so that comparisons can be made with the speed of the water at these points.

Sediment carried by the stream

Using plastic jars, samples can be taken of the water and of the materials found at various points alongside the water's edge and in the stream bottom. Back in the classroom a paper centimetre scale can be taped to the side of the jars. The samples should be shaken and then allowed to settle until the water is clear. The heaviest material, such as sand and gravel, will collect first (within a matter of a few minutes) while silt will not settle for several hours and clay particles may not come to rest for a number of days. Organic matter will float on the top of the water. The depth of each layer may be read off using the taped rule on the side of the jar.

The shape of the banks

In its early stages, a fast-flowing rivulet on a steep hillside will contain small amounts of water. Because of this, erosion will be concentrated in a narrow band and the river will erode a narrow V-shaped valley. This will be in stark contrast to the profile of a larger stream on flatter land where erosion is over a wider area, producing a broader, U-shaped profile. Information on the depth and width of the watercourse together with sketches of the children's observations can help in alerting pupils to these contrasts.

A curve or meander in the course of a stream will produce marked contrasts in the shape of the river banks. On the outside of the curve the water will be eroding heavily, scooping out material and often undermining the banks and the roots of plants that grow there. The water will be deeper here also. *Hence observations should not be made from this bank.* On the inside of the bend the water will be eroding less severely if at all and will be depositing material, often producing gently sloping river beaches which may provide excellent observation points and places where samples may be collected.

Modelling and simulations in the classroom as described earlier can help to explain the processes at work while drawing and comparing the slope of the banks and the materials which may be observed there will help in appreciating the nature of the stream's course and some of the reasons for its present shape.

Water and the activities of people

A study of the ways in which water is used (and abused) by people can complement river studies. Asking children to audit the environment of a river, i.e. asking them to identify places along the stream which they find attractive or unattractive and why, can lead to proposals for environmental improvement.

Visits to restored mills or modern water treatment plants and interviews with workers from fishery boards can also be useful.

Experiments and investigations

Engaging in experiments and investigations is an essential element of the child's development in geography and science and it can be a most enjoyable and exciting activity. Many activities in the exploration of natural environments are particularly suited to this approach. Observing, sorting, classifying, posing hypotheses, testing and experimenting and drawing conclusions will all be involved.

Exemplar 8 contains just a few suggestions which might be considered by teachers but it should be remembered that as children grow older they should be encouraged to identify their own problems for investigation and to suggest ways in which experiments might be carried out.

The experiments described in *Exemplar 8* concentrate on physical features such as rocks and soils, but in any exploration of natural environments the interaction of plants and animals with their physical surroundings will be significant. The use of techniques which are suitable for the investigation of flora and fauna (such as quadrats and line transects to chart the occurrence of plant species) is fully described in the *Teacher Guidelines for Science*. Schools that wish to explore the geography, history and biology of Irish peatlands will find many experiments, modelling exercises and suggestions for integrated studies in a comprehensive guide: Catherine O'Connell, *Peatlands and the Primary Curriculum* (Irish Peatland Conservation Council, Dublin, 1994).

Many excellent suggestions on how a range of further experiments and investigations may be used in the study of natural environmental features may be found in a series of three books for teachers by Rachel Bowes, *Earth in the Environment; Soils, Plants and the Environment; and Water in the Environment* (Geographical Association, Sheffield, 1992).

Keeping a wildlife garden

Becoming involved in the establishment and development of a wildlife garden is an excellent way for children to come to appreciate natural features and how these may be managed or changed by human intervention. The links and interdependences between physical features (such as water, rocks and soils), natural phenomena (such as rainfall and temperature changes) and the lives of plants and animals will become very real for children. Many valuable lessons may also be learned about environmental care and enhancement.

A comprehensive guide for teachers on how to create and maintain a wildlife garden by Patrick Madden, *Go Wild at School* (School Wildlife Garden Association, Dublin, 1996) and an accompanying video have been published by the School Wildlife Garden Association, Scoil Treasa Naofa, Donore Avenue, Dublin 8.

Exemplar 8

Experiments with rocks and soils

third to sixth classes

Safety first

Before allowing children to engage in experiments teachers should read the safety advice contained in the *Teacher Guidelines for Science* and in the section *Organising fieldwork* above (pp. 74–81).

The suggestions in this exemplar involve experimenting with rocks and soils, and when handling these materials the following should also be noted:

- the collection of rocks, soils, plants or any other materials in the environment should be done only under the direct supervision of an adult
- great care should be taken when handling soil because of the risk of infection. Gloves should be worn and any cuts, sores or abrasions should be covered
- hands should always be washed thoroughly after any activity in which soil is used
- rocks should be covered with cloth and goggles worn if specimens are to be broken (by an adult or by a pupil). Care should be exercised when handling fragments, as these can be very sharp
- the experiments do not involve the use of toxic materials but, as in all experiments, children should be warned never to taste materials or place their hands in their mouths during experiments.

Sorting and classifying natural materials

From the earliest stages in their exploration of the environment children should be encouraged to sort and classify the natural materials which they can find. In the infant and junior classes materials such as plants, soil, rocks, stones, mud and sand can be collected, labelled and displayed in the classroom. Gradually the concept of living and non-living things will emerge and children should be able to classify the items into these categories.

Collecting rock samples

Children will encounter rocks and pebbles of many different types as they explore the environment. Indeed it should be possible to build up a reasonably comprehensive collection of rock samples in the school. This collection should include rocks from each of the major rock groupings (igneous, sedimentary and metamorphic). In Ireland common examples include granite (igneous), limestone, sandstone, shales (sedimentary) and quartz (metamorphic). These can be supplemented with pumice stone (an igneous rock available from the chemist), chalk, coal and sea-salt (sedimentary rocks) and marble (a metamorphic rock available from stonemasons' workshops). Several children's books include photographs and descriptions which can be used to identify these samples, and the location of those found in the environment should be noted and the samples labelled. Samples can be displayed alongside a map of the locality marking the locations of the finds.

Sorting and testing rocks

Samples of the rocks mentioned above can be examined and sorted according to a number of criteria:

Texture and appearance

The texture of a rock can often give important information on how it has been formed and how it might be used by people. Examining the rock carefully using a magnifier, children could look for:

- a grainy rough texture (possibly sandstone)
- pebbles or larger fragments (a conglomerate)
- wavy stripes or banding (often a sedimentary or perhaps a metamorphic rock)
- crystals (often visible in an igneous rock such as granite)
- fossils (an indication of chalk or limestone)
- spots or holes (pumice stone contains bubbles caused by trapped gases).

Colour

When examining for colour, only freshly broken surfaces should be used, hence the need to break samples. (The freshness of the surface may be prolonged by keeping the samples in a jar of water or by covering the surface with nail varnish.) Some distinctive common rock colours include the speckled white and black of granite, the dark grey or tan colour of different types of limestones, the red sandstone common in Cork and Kerry and the black basalt of the Antrim Plateau. The effect that the colour of the local stone has on the appearance of buildings can be examined in conjunction with this activity.

Hardness

Using samples of rocks as listed above, children can test the extent to which the surface of each can be marked with a range of tools. These can include the child's fingernail, a paper clip, a coin, files (such as a nail file and a file from a hardware shop) and a nail. The results can then be tabulated and consideration can be given to the implications this has for the use of the materials in construction. The built environment may include examples of some of the rocks and it may be possible to contrast how a strong stone such as granite has been used for important buildings and footpaths where wear is greatest while softer stone such as sandstone has been used in carved decoration. The extent to which these various rocks have resisted erosion may also be apparent.

Looking at a soil profile

Soil is a mixture of rock particles and organic matter which is formed through the interaction of weathering, biological processes (such as plant growth and decay and the actions of animals such as worms) and the percolation of water which re-organises the constituent elements. If a hole is dug down into the soil its layers (or horizons) will become visible: the lowest layer will contain much of the parent material (such as rock or, in glaciated areas, boulder clay) from which the soil has been formed while the intermediate layer (subsoil) will mark a transition between this and the top layer (topsoil) in which animals and the roots of plants live.

Older pupils will be able to distinguish the layers in the profile quite readily and sometimes it is possible to see these layers when excavation has taken place for building or road extension. Soils are created very slowly and they evolve over time but these are very difficult concepts for primary school children to appreciate.

Examining constituent materials

Before children can accurately describe soil samples, they should be allowed to handle and come to recognise pure samples of some of the possible constituent elements which they contain, such as peat, clay, silt, sand and gravel. Each of these substances has its own particular characteristics: sand can be poured when dry and moulded when wet, silt has a soft silky feel, clay is sticky and can be rolled into a sausage shape, peat has a soft spongy feel and can absorb water. Sometimes it can be useful to place the samples in 'feely bags' so that the pupils have to handle and recognise the sample solely by touch.

Within the local area a range of soil samples will probably produce quite contrasting results. In urban areas many if not all the soils will be almost entirely artificial, created when builders landscaped housing estates during construction. In some cases it may be necessary to bring samples from further afield to allow comparisons to be made.

When soil samples are to be examined they can be spread out on newspaper. Living things can be removed and returned to the environment. Humus (dead organic matter) may also be separated out. Following the familiarisation described above children will be able to describe soil samples much more readily using terms such as 'peaty', 'sandy', 'clayey' and can look for some of the characteristics of these constituent materials in the samples. A set of tests can be assembled and the results tabulated. Can the soil be rolled into a sausage? If some soil is rubbed between the fingers how does it feel? What colour is the sample? What does it smell like?

Filters such as a large garden sieve and a colander could be used to separate the constituent materials further and the results recorded.

Settlement jars

The use of this technique in the analysis of river-carried sediment has been described on p. 110. A quantity of soil (about enough to fill half a flower pot) may be placed in a transparent plastic jar with some water, shaken vigorously and allowed to settle. Sand, silt, clay and organic matter will separate in different layers and at different speeds. The relative depth of the layers of various samples can be compared.

Effect of soil constituents on growth

Samples of sand, clay, peat and other materials may be placed in pots in which cress or other seeds are sown. Children can then record how well, if at all, the cress grows. The experiment can be made more comprehensive in a number of ways: a control set of pots and seed can be kept dry to illustrate the need for moisture; the temperature at which the samples are maintained may be varied (some samples will dry out more readily in the heat); and sample soils from different locations in the area can be used as the growing medium. Links between the observed results and the characteristics of the materials should be discussed.

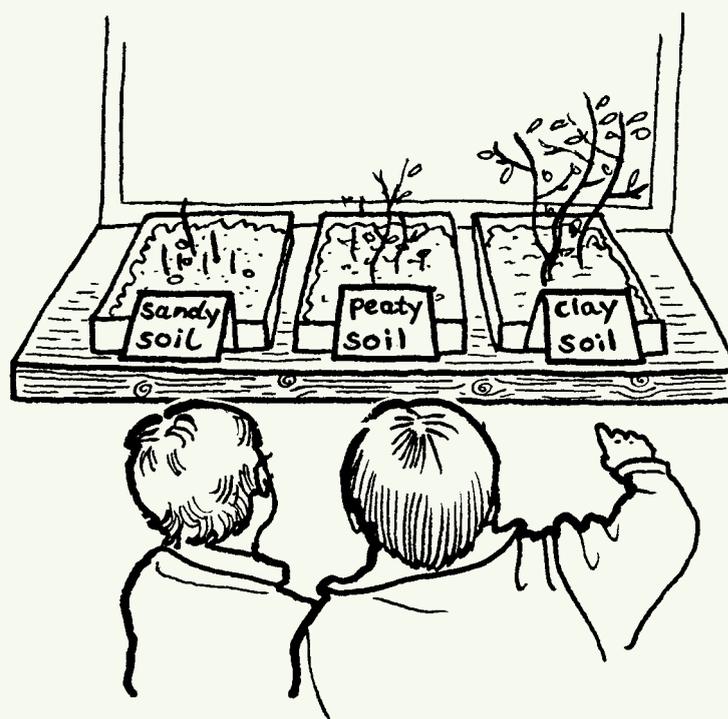
Water in the soil

The amount of water in the soil can be quite surprising and is often not appreciated by children. Weighed samples of soils may be placed in foil trays and dried in an oven at a low temperature or over time. The samples can be re-weighed and the difference in weights calculated. Beakers might be filled with equivalent weights of water to emphasise the amount of liquid involved.

Water retention

Prepare soil holders by cutting large plastic bottles in half, cover the stopper hole with a coffee filter paper and invert the funnel into the lower portion of the bottle. The soil samples are placed in each of the funnels and an equal quantity of water poured into each, and the passage of the water through the sample (if it occurs) may be timed.

In this activity, as in many others, children should be encouraged to discuss and predict the likely outcome of the experiment in advance and to propose the means by which results could be recorded. A check-list which could be ticked as appropriate could be drawn up, to include categories such as 'water stays on top', 'water soaks in', 'water runs through slowly', 'water runs through quickly', etc. The results and the earlier predictions should be evaluated and, if possible, reasons sought for the phenomena observed.



Engaging in experiments and investigations is an essential element of the child's development in geography and science.

Learning about other places

The wider perspective

Learning about people and places beyond the immediate environment is a fundamental part of geographical education. Geography responds to the natural curiosity of the child about the diverse environments of the world and, of course, studying the lives and environments of others enables the child to understand and appreciate more fully the features and individuals found in his/her own place and community.

However, this aspect of the geography curriculum has an even more fundamental role to play in the education of the child. As children study peoples and environments in their own country and in other places throughout the world they can acquire an informed understanding of the lives, concerns and perspectives of others. Their assumptions and attitudes may be challenged and a respect for peoples of diverse cultural, ethnic, social and other backgrounds may be fostered. An awareness of the interdependence of the peoples of the world and their collective responsibility for the global environment in which they live will be developed. In short, geography equips children to become informed and active participants in the global family.



Recognising in other places some of the common patterns and features originally encountered in the local environment enriches and reinforces geographical concepts. Cooking methods and foods may vary but the need for nourishment is common; the local stream may be compared with the larger river; movement of people may take place using the same methods but for very different purposes.

Key questions in the study of places: a summary

1. Where is this place?
2. What is this place like?
3. Why is this place as it is?
4. How is this place changing?
5. How is this place linked to other places?
6. How is this place different from or similar to other places?
7. What would it feel like to be in this place?

What places will children learn about?

The geography curriculum is structured to ensure that children learn about places beyond their immediate experience from the earliest years in the primary school. In the programme for infants and for first and second classes, the inclusion of the unit 'People and places in other areas' provides opportunities to explore aspects of the lives of people in places in Ireland and other countries. Often the aspects, places and countries used will arise in other learning contexts, for example as children compare homes or food in different places in other units, as an item of personal interest to a child is discussed in general conversation or as a place-name occurs at story time. Theme work will also provide opportunities for the exploration of life in many places in Ireland and elsewhere.

For the middle and senior classes the requirements of the curriculum are more explicit. In third and fourth classes and in fifth and sixth classes children should study a locality in Ireland which contrasts with their home environment, an environment in a European country and one in a non-

European location. More variety and a greater range of geographical processes and features can be ensured by using one set of locations in the middle classes and a second set for the senior classes. It should also be noted that at least one of the non-European environments studied should be in an economically developing country.

Key questions about other places

Just as the child's exploration of the local environment involves the acquisition of knowledge, skills and attitudes, learning about other places should also involve the child in a range of activities characterised by questioning and investigation. The key questions of geography (see p. 66–67) which may be used in local studies are also applicable when studying other areas and they may be used to provide a framework for the teacher's planning and for the children's projects and enquiries. The significance of these questions lies in the disposition which they exemplify: an emphasis on enquiry, investigation and critical comparison rather than the rote acquisition of descriptions of exotic locations.

Exploring life in other parts of Ireland and in other countries through the study of carefully chosen locations affords greater opportunities for the development of geographical skills and for meaningful comparisons to be made with the children's home locality. However, it should also be borne in mind that all environments studied should be firmly related to the wider contexts in which they are situated: the location of the locality and its links with the county, region and country should form part of the local study. The same should be true of the other Irish environment studied and of the areas chosen in other countries. Frequent reference to atlases, maps and globes will be a feature of all work on other environments, as will the use of large-scale maps of the areas studied.

Children's attitudes about the world

One of the greatest challenges facing teachers and pupils in this work is our preconceived notions of other peoples and places. Before they come to school and during their school years children are constantly acquiring information about the world. Sometimes this is done through direct experience such as visits to the homes of relatives, on shopping expeditions to larger towns and on trips and holidays to places within and beyond Ireland. A great deal of children's information about the world comes to them indirectly from television and video, from books and comics, from electronic sources and from the accounts of others in the family. All of this information provides a rich source for the teacher to exploit in discussion, but some attitudes and misconceptions which children may have acquired will need to be challenged, often those concerning people in other countries.

Television, in particular, presents extremely powerful images to children. A significant amount of the information about distant places which children acquire from television seems to come from 'soap operas' and from advertising rather than news programmes or documentaries. Both of these sources can present an incomplete or erroneous view of places and the lives of people who live there. Advertising, because of its need to convey messages in the shortest possible time, often relies on

stereotypical images and the impact of the medium is such that these images are readily absorbed. So pupils may come to the classroom with an incomplete or incorrect knowledge about the world and they may have acquired biased views of other people.

Nor should it be assumed that the classroom is free from bias. Indeed many of the books and resources which we use with children can reinforce, perhaps unconsciously, a stereotypical view of the world. For example, wholly unrealistic images of farmers and their work are acquired by many urban children from some story books or cartoon figures and, at times, from visits to some farms which present a romantic, idyllic picture. The once popular style of lesson or book which presented the lifestyles of the children of developing countries as exclusively rural, backward, simple and traditional will be avoided by all teachers. Nor should the inhabitants of developing countries be encountered solely in terms of the cash crops which they

supply to the developed world: Kenyans do not exist solely to supply tea to Ireland! Both teachers and pupils need to avoid oversimplification and untenable generalisations: poverty is an urgent problem in Indian cities but not all of India is undeveloped and poor; living conditions and levels of technology which people in Europe would find unacceptable may be perfectly suited to the needs and social structure of rural African communities (and such communities may evince enviable social values not often present in developed countries).

For these reasons studies of the lives of people in other countries should be based upon identifiable locations, individuals, families and communities. Although this may seem to restrict learning about the countries involved it is likely to result in a more authentic picture of life in that place and, if the examples are chosen carefully, a reasonably typical picture of life in that place should emerge.

Learning about other places: some suggested activities

- visiting other places in Ireland
- photo packs and resource packs
- video
- story
- visitors, friends and relatives
- news and topical affairs
- projects
- links with other schools
- before-and-after stereotypes
- materials for studying developing countries

Some possible approaches

The suggestions which follow may be used in the study of places beyond the locality. Most of the techniques are adaptable for almost all ability and age levels and may be supplemented by other approaches, such as role playing and drama, and with cross-curricular theme work.

Visiting other places in Ireland

Depending upon the location of the contrasting Irish environment selected for study, it may be possible for children to visit the area in question and learn about its features through investigations and enquiry. There is really no substitute for such direct experience of the environment and even if only one visit is possible it should be undertaken. Preparation in advance of the visit and the programme of follow-up work may utilise some of the other approaches described in this section, while the suggestions contained in the earlier sections *Organising fieldwork*, *Investigating human environments* and *Investigating natural environments* will provide advice on suitable learning activities for use during the visit.

Photo packs and resource packs

When visiting and exploring an environment is clearly out of the question photo packs and resource packs may be used to enable children to learn about another place using at least some of the investigative methods which children might have developed in the local area. Photo packs consist of large photographs, often taken from both an aerial and a ground perspective, of features in the environment. Good packs will include a wide range of subjects covering both natural and human features and many aspects of the lives of people.

Using selections of these pictures it is possible for children to gain an impression of the place in question, to gain some sense of its distinctive features and to make detailed comparisons with life in their own locality. Simple activities may involve recognising the features and events portrayed in the pictures; further work can entail comparing the contents of the photographs with each other so as to gain an impression of the contrasts and similarities within the area depicted. The subjects of the pictures may also be compared with the experiences of children in their home environments and similarities and differences noted.

Resource packs include a wider range of materials. Photographs normally form part of the pack and these may be complemented by a wide range of items: maps of various scales (some large-scale maps similar to those used for local studies should be an essential component), information booklets on the area, copies of timetables, newspapers, menus, posters and advertisements, postage stamps, phone cards, local currency, and samples of clothing or goods made by the people portrayed in the material.

The purpose of the material is similar to that of photo packs: to allow the teacher and children to experience something of the life of another area and to provide the raw materials which will enable children to ask questions, conduct research, make comparisons, abstract information, present it in graphs, charts, maps and written accounts, and draw conclusions from a diverse range of evidence. For example, many of the questions which children will investigate in studying homes and buildings in an urban area near the school could also be attempted for an environment in another country using photographs. Maps and photographs could be correlated so that the location of the viewpoint of each photograph is identified. Maps and timetables could be used to plan journeys. In contrast to textbooks, resource packs allow the teacher to tailor the range of items used to the needs and abilities of his/her pupils or to the theme which the class is currently studying.

Commercially produced photo packs and resource packs are available for a number of locations, mainly places in non-European locations, because some of the first of these packs were compiled by development agencies. However, the range available is growing. The packs often have background information for the teacher and suggestions on how the materials might be used. Some may also complement schools broadcasts. Few such packs are available for Irish locations at present but it may be possible for teachers to visit the area in question, take photographs and collect items for inclusion in a similar pack. These will have the advantage that their significance can be enriched by the teacher's oral accounts of his/her visit to the area.

Video

Video can play an important enriching role in locality studies. It can be used to stimulate children's curiosity, it widens their interest and it can be very effective in conveying something of the sense of place of another area. It can convey not only the appearance but also the sounds of a place and it can present much detail about how people live, work, travel and interact with their environment. A wide range of videos is available and school broadcasts will also be viewed in recorded format.

For the medium to be used successfully previewing of the tape by the teacher is essential. The level of language and the extent to which the tape complements the aims of the work in hand should be considered. Often only a section of the tape will be suitable or relevant and this may then be selected in advance of the lesson. Having a knowledge of the contents will enable the teacher to prepare pupils fully, to set the context and to explain any unfamiliar terms in advance. It can also help if the children's viewing is directed by having to watch out for particular items of information or opportunities to make certain assessments or judgements. These might form part of the post-viewing talk and in some cases the tape might be viewed a second time, during which stills (using the pause button) might be discussed.

When assessing videos for purchase, consideration should be given to how well they fit in to the locality studies in the school's geography plan, the extent and quality of the follow-up suggestions and background material supplied with the tape and the availability of linked photo packs, resource packs, CD-ROMs and other teaching materials.

Story

Story is one of the most versatile and useful of all teaching approaches in geographical education. Some of the earliest geographical concepts developed by the child may be acquired through hearing and reading stories of people from the locality and other areas and through examining the accompanying illustrations: the names of buildings and other features, the sense of a place different from one's own environment, the notion of home, shelter, work and leisure, the effect of weather phenomena on the lives of people. Many stories also lend themselves to the development of geographical skills: stories of journeys, from simple excursions to the shop or school to adventures over long distances told in novels, may be used for map work, drawing and sketching.

The ability of story to convey the sense of a place and time different from that of the reader, and advice on how stories might be used in the classroom are discussed at length in the *Teacher Guidelines for History*. For the teaching of geography, story is invaluable for the way in which it can create a mind-picture of a place which includes not only details of features and objects of an environment but also the mood of a place. Story has a unique ability to allow us to come to understand the perspective of others, to empathise with their situation and to challenge the attitudes we hold.

An invaluable guide to the use of stories in geography lessons with a bibliography of suitable stories may be found in Heather Norris Nicholson's *Place in Story-Time* (Geographical Association, Sheffield, revised edition, 1996).

Visitors, friends and relatives

Opportunities may occur from time to time when it is possible for people who live or work in the area under study to visit the children and to talk about it. A relative of a pupil may be resident in another part of Ireland or abroad and arrive home on holiday. Many Irish families have relatives abroad, both in developed and developing countries, and some may be willing to speak to a class. Overseas aid charities and development agencies may also be able to supply a speaker.



If children cannot go to visit a distant location then the next-best thing may be to invite a person from that place to the classroom!

Speakers from other localities can help make the study of a distant place very real for pupils but the methodology requires much careful preparation. Advice on organising the visit of a speaker is discussed in detail in the *Teacher Guidelines for History*.

It is also worth remembering that family members living abroad can help by agreeing to answer children's queries by post or e-mail and some may help to procure photographs, local maps and other items.

News and topical affairs

News items, both the personal accounts of incidents and journeys in the lives of pupils and the occurrences and major events reported in the mass media, frequently offer geographical opportunities. The interest generated by these events should be exploited: the places involved may be identified and labelled on the wall map while newspaper cuttings may include photographs of natural phenomena or human events. Many newspapers maintain web sites which children could visit using the computer so as to obtain further information. Children may also be encouraged to investigate further the people, climate, features or other aspects of the places mentioned. Working out how one would go to the place from Ireland (and how long the journey might take) can help the child to envisage the distances and locations involved.

Much project work, whether conducted by groups or individuals, may degenerate into little more than transcribing undigested paragraphs of information from encyclopaedias and reference books. This must be avoided at all costs.

Projects

Projects have been a common feature of primary classrooms for some years and they are a valuable way in which children may become active in their own learning. Moreover, they accord with the importance the language curricula now attach to writing for an audience, drafting and redrafting and fostering the child's impetus to write. However, much project work, whether conducted by groups or individuals, may degenerate into little more than transcribing undigested paragraphs of information from encyclopaedias and reference books or printing passages selected from CD-ROMs or on-line sources. This must be avoided at all costs.

One useful method is to help the child frame a number of questions about the topic of the project in advance: the need to answer these questions rather than the layout of the reference books will tend to dictate the format and the content of the finished piece. For children who are unused to project work, the teacher might even offer them a list of suggested questions and areas of enquiry. Later, questions for investigation should emerge through discussions between the pupils and teacher.

Teachers should also help pupils in selecting and using suitable reference books and should encourage the use of other sources of information. Children could conduct surveys among their peers, the school staff, family members or other relevant groups (for example on the extent to which people use products from the country in question, or on the images which people have of the lives of people living there). They could be encouraged to obtain information from sources such as newspapers, magazines and internet sites, to construct maps and to present information collected in ways which are different from the original sources.

Links with other schools

These can add greatly to the excitement of the study of an area beyond the immediate environment and can also enrich the study of the children's local environment. Often personal contact between teachers can facilitate the inauguration of links between classes. Sometimes children in the class may have relatives or friends in school in another country. Frequently the internet will carry details of schools seeking to make contact with other schools for such exchanges and of course information technology offers many advantages in the transmission of messages and data.

The ultimate goal of development education is to enable the adults of tomorrow to arrive at just solutions to the dilemmas which face the global community, to empower them to act as responsible citizens of the world.

One way in which to go about the work is for both classes to prepare work on their own localities and then exchange it with the linked school. This means that the work on their local study has a sharper focus and a ready audience and they will be well prepared to make comparisons with the descriptions and findings presented about the distant location. It also helps if children write to named individuals in the linked class so that some sense of personal contact is achieved.

Before-and-after stereotypes

This activity can enable children to become aware of the extent to which their view of other people and places is biased or influenced by stereotypes. *Before* work commences on the study of a place the children are asked to write down the first five or ten things which occur to them when the name of the place (and the country in which it is located) is mentioned. The sheets are then stored away without comment or discussion. The exercise is repeated *after* completion of the unit of work and the current reaction of the children is compared to their original thoughts. What do they notice? Have any opinions changed? Why do they think they had thought like that?

Development education

Specific units on development education are included in the curriculum for fifth and sixth classes but some of the topics involved may well be encountered at much earlier stages. The issues involved are complex. They include topics such as the circumstances of international trade, the effect of aid and debt, the inequitable distribution of resources and food, and the need to recognise the interdependence of peoples and ecosystems in development. These form an essential element in the child's understanding of the global community of which he/she is a member.

Learning about the issues involved is a first step: the ultimate goal of development education is to enable the adults of tomorrow to arrive at just solutions to the dilemmas which face the global community and to empower them to act as responsible citizens of the world. This involves developing skills of analysis and debate, being able to propose constructive solutions that respect the rights of others and acknowledging one's own responsibility for the welfare of the Earth and its peoples. Some of these skills are at the heart of geographical enquiry and are utilised throughout many of the methodologies discussed in these *Guidelines*. Approaches such as the use of story, resource packs and interviewing visitors have obvious applications in development education.

Development education agencies and charities have been at the forefront of the development and adaptation of other teaching techniques, such as games and simulations, role playing and drama, music, dance and co-operative activities. Several packs are available which provide excellent suggestions and a range of support materials. Examples include:

- *Ar Scáth a Chéile: Development Education in the Primary Classroom* (Trócaire and Curriculum Development Unit, Mary Immaculate College, Limerick, n.d.)
- Therese Hegarty et al., *Windows on the World: Shaping and Being Shaped by Culture* (4 vols., Columban Fathers and Sisters, Navan, 1992)
- Kathleen Horgan, *Team Planet: An Action Pack on Our World and Ourselves* (4 vols., Primary School Development Education Project, Limerick, 1993)
- Ita Sheehy, *So Everybody Fights: A Teaching Programme on Development Education for 9–13 Year Olds* (Irish Commission for Justice and Peace, Blackrock, 1988).

A reference library of support materials for development education is maintained by the National Committee for Development Education, 16 South Cumberland Street, Dublin 2.

Maps and mapping

An essential skill

The use and construction of maps is one of the most distinctive of all geographical skills. Maps enable us to record and present information about places and spatial relationships and they can also help us to understand more about environments, both those in which we live or move about and those of which we have no direct experience.

Yet maps are not solely related to the study of geography. Maps and plans are encountered constantly in everyday life and the ability to interpret and use them efficiently is an essential skill. Indeed it was the need to express the vital importance of the child's ability to use maps and other graphical forms such as charts, diagrams, photographs and models that led to the use of the term *graphicacy* to complement the skills of literacy and numeracy. This section of the guidelines deals with the introduction and development of map work in the primary school years.

Mapping concepts

Understanding and using maps involves the simultaneous use of a number of concepts and skills:

- a map is a plane surface (two-dimensional) representation of a three-dimensional landscape. As such it is a drawing from an *aerial perspective*, i.e. the view from above, a view which children will experience very rarely
- maps use a wide range of *symbols* to convey information. Some of these, such as lines to represent roads, and blue and green shading to show land and sea, seem to be relatively easy for children to understand but others are much more abstract. Colours may also be used to represent altitude, countries or environmental regions; a point may mark a railway station, a village or town; a cross may represent a church; and lines may show roads, rivers, canals, railways, boundaries or contours. The efficient reading of these symbols (which are not consistently used in all maps) requires the child to *discriminate* between the symbols, *interpret* their meaning and *select* those relevant to his/her needs
- if a map is to be used to find a route or as an aid to understanding an environment it must be aligned correctly with the features on the ground. The ability to align (or set) a map is known as *orientation*. In plans or maps of small areas this involves recognising features on the map and linking them to their real equivalents in the environment; the orientation of maps of more extensive environments such as that of the county or Ireland, requires a familiarity with directions, cardinal points and the compass

- locating positions on a map involves the use of some type of grid system or *co-ordinates* which allow positions to be described using horizontal and vertical references
- the construction and use of maps also involves the concepts of *scale* and *distance*. Understanding and using scale is dependent on the child's mathematical concept of ratio and his/her ability to measure accurately.

Map work for infant to second classes

Much of the geography programme for infant classes and first and second classes is designed to refine the child's knowledge of the locality and to extend his/her awareness of wider environments. The development of the child's mapping ability will complement this process: mapping must not appear as an end in itself but as a relevant and accessible tool.

Aims of map work in the early years

Mapping activities in the infant and junior classes should enable children to come to appreciate the uses and possibilities of maps. Through drawing pictures of events and places they have encountered, children should begin to appreciate that they can communicate information about their environment to others through the medium of maps. Gradually, these activities should also help children to understand how maps can help to extend our knowledge of environments: how they can clarify and refine our notion of where objects, features, places and spaces are located and how and why they are related to each other. Parallel to the growth of mapping skills will be the development of the child's ability to use spatial language, i.e. terms (such as beside, beyond, near, far, etc.) that enable him/her to describe location, direction and distances in the environment.

Suggested activities

The activities described on the following pages provide opportunities for the development of spatial language and introduce the child to maps as representations of the environment. Building on the earliest drawings children make of their homes, play spaces and other areas, these activities encourage them to explore picture maps as representations of the environment. At the same time they provide opportunities for the development of spatial language and introduce some of the main mapping concepts, in particular aerial perspective, direction, orientation and the use of a simple key.

A map-rich environment

All the activities can be complemented by the availability and use of maps and diagrams in the environment of the classroom and school. Diagrams used by the teacher and pupils to record seating in the classroom, the allocation of coat racks and the location of equipment on shelves are all types of maps. Several excellent atlases are available for junior classes, often incorporating satellite images and a range of simple maps. Children in first and second classes should also have ready access to maps of the locality, of Ireland and of the Earth.

Exemplar 9

Early map work – pictures, plans and maps

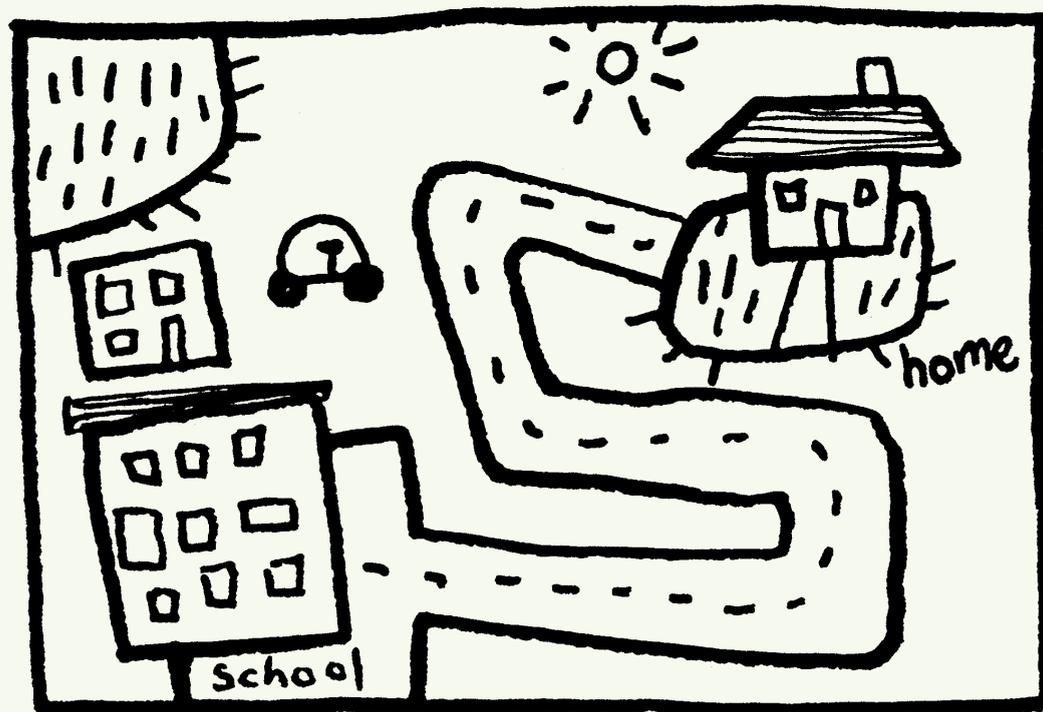
infants to second class

Picture maps

Children may be readily encouraged to draw pictures of their own homes and areas within them, of the classroom and school and of play spaces and other areas. Environments explored in the vicinity of the school, on 'nature walks' and during other visits may also be depicted.

These pictures will show what is to be seen in a place and may indicate roughly where things are in relation to each other. Simple picture maps may lack the symbolic nature of true maps. Generally elements in the environment will be presented in purely pictorial form, though some elements, such as paths and roads, may appear in aerial perspective. Nevertheless, picture maps provide an excellent basis for discussion about the things which can be seen in the environment, where these elements are and the links which exist between features such as paths, roads or walls.

These discussions can play a crucial role in refining and extending spatial vocabulary (the bench near the window, the tree in the middle of the field, the gate next to the shed, the wall in front of the house), while group discussion of several of the children's pictures may demonstrate how these pictures allow us to learn about environments we may not have seen. At times, children's pictures will include items which are not visible: for example, a picture of the front of the school may include the bins stored at the back of the building. Challenged on this issue, children may respond that they know the bins are there. Walking around the environment and comparing the pictures with the actual view can further enrich the child's awareness of environments and the problems associated with their representation.



Picture maps give children crucial opportunities to portray the features and events of an environment and indicate the relative location of items.

Stories and picture maps

Picture maps which retell a story and illustrate its location, either real or imagined, can be equally useful in the development of mapping abilities and spatial language. Some may be drawn by individual children but co-operative group work on a frieze can encourage even further discussion and learning.

Playmats

Playmats, showing the layout of one or two streets or of a farm, can provide invaluable opportunities for the development of spatial language. Used in structured play or in group discussions, playmats can introduce children to an aerial perspective of an area. Features, directions and distances can be discussed, toy vehicles moved along the street and buildings added to the area. Many similar activities can be introduced when playing with toys such as railway or road sets and model farms or garages.

Simple plans

Exploring the plan of small objects provides an excellent introduction to aerial perspective. Tracing around the base of toys or other small items which have been placed on a sheet of paper will create plans of each object. These can then be cut out and labelled.

Plans can also be examined by placing objects on an overhead projector and looking at the resulting plan on the screen. The plans might be traced and cut out. This activity can highlight very quickly the limited information which a plan contains. For example, the plan of a coin and a small bottle will appear similar but the objects are very different, and plans do not give any information on colour or texture.

These activities can be extended by playing matching games in which children match pre-prepared plans to original objects or swap plans they have made with a partner and ask him/her to try to match plans to the original.

Picture and plan

Much valuable work can be done by comparing oblique and aerial views of objects. A range of simple everyday objects such as mugs, small bottles, boxes, teapots or toy cars can be viewed and drawn in elevation (from the side) and from an aerial perspective. (The latter may be facilitated by having children place the object on the floor or in the bottom of a large box. This encourages children to view only from above.) Comparisons should then be made between the aspects of the object to be seen in the side and aerial perspectives.

Using a sheet of paper as a carpet or as the area of a farm and placing model furniture or model buildings on it will highlight how the furniture or buildings appear in plan form. Marking the outline of the different model pieces to show the space they occupy and then removing them will demonstrate the crucial characteristic of a map as a plan and how the different pieces relate to one another. This can be further emphasised through discussion and by encouraging the children to draw a person's route from the door to the television and thence to the armchair or from the house to the barn and thence to the shed.

The similarity of many of the outlines may also lead to the need for a simple key in which colours can be used to indicate different parts of a plan, e.g. chairs could be coloured red, cupboards blue, the television black, etc. While the term 'key' might not be used, this work will provide a valuable basis for the development of this concept in future years.

Exemplar 10

Simple maps in the environment

first and second classes

Relating the map to the environment

While activities involving models and toys can provide excellent ways to introduce particular mapping concepts, the use of maps and plans in real situations is crucial to the development of children's mapping skills and an appreciation of their usefulness in depicting and understanding the world. Many of the suggestions that follow would be useful in a topic on the school and its community. The techniques involved could be used when exploring other areas in the locality and beyond.

Completing plans

For children in first and second classes, maps or plans of the classroom will provide the context for the application of mapping skills. Recording the placing of furniture prior to its temporary removal or relocation presents a practical reason for map-making. Children may be asked to complete a partially finished plan of the room in this case. This activity will require the child to align the map with the features depicted on it, recognise what is missing and complete the map. This activity will also obviate difficulties children may experience in drawing the boundaries and key locations in the geography of the room: an incomplete plan which shows the location of the door, teacher's desk, windows and blackboard will simply require pupils to establish directions and relative positions of elements within the room.

Children should be allowed to move around the room in order to draw their maps on which the missing items may be recorded in simple plan form. Discussing and comparing the maps produced will highlight the degree of choice exercised by pupils when deciding which items to include and may also provide opportunities for discussion of the relative sizes of the objects inserted on the plans.

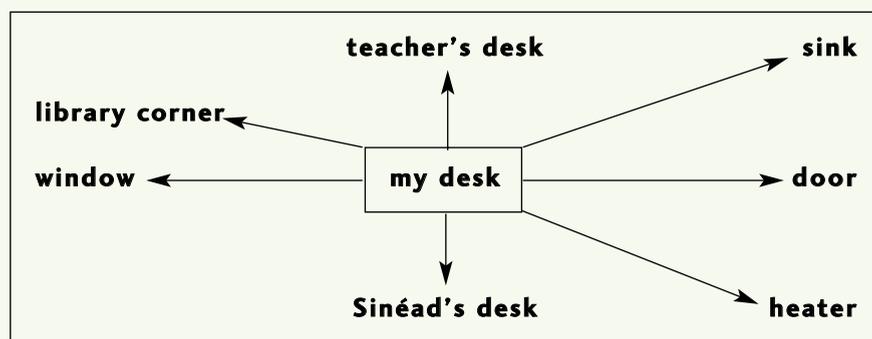
This type of activity can be very useful when exploring other environments such as a local natural environment or an urban setting. It can help children to become familiar with the features of the area or draw their attention to particular features and their inter-relationships. For example, completing a plan of a pond and its surroundings can alert children to the variations in vegetation between the edge of the pond and other parts of the area.

Signpost maps

Exploring directions and how places and objects within the classroom are related to one another in an activity such as that described above helps to refine the child's sense of location and can lead to the use of signpost maps based on the child's own desk. As further areas are explored and the child's sense of direction comes to be developed, other signpost maps may be constructed to include locations beyond the classroom and school.

Simple orienteering

One of the most common ways in which we use maps is to plan a route. Children in second class and beyond can be readily introduced to this activity. Initially, routes to be followed might be marked on a plan of the classroom. A number of stopping points can be included at which specific questions or observations have to be made. For example, children might have to complete a drawing of an object which can be seen from that particular stopping point or count the number of panels in a cupboard door, etc. The activity can be varied by providing a map with only the first stop marked. To complete the route, instructions would have to be read at each stopping point. The resultant route could then be recorded by the child on his/her map.



Signpost maps help to record locational details and directions in the environment.

One of the most complex aspects of this activity is the alignment of the map to the environment as the child moves around. A simple strategy is to encourage the child to stand in a particular position and turn the map around until the particular items in the environment harmonise with their relative representations on the map. Much practice in small spaces, such as the classroom and school, will be required so that this habit is established from the beginning and so that checks are made each time one changes direction. In orienteering exercises, it may be useful for the child to place the map on the ground at each stop or after each corner.

Once the idea of following the route on the map is established the activity can then be used in other locations, such as the PE hall, the corridor of the school and the playground. A number of markers may be placed at strategic points around the building and grounds and their location marked on a map. For this age a partially pictorial map might be used, i.e. a map on which areas such as the yard or basketball pitch appear in true plan form while buildings or walls are shown in iconic form. At each marker the child would be required to complete a specific task, for example to record an attached symbol, picture or colour, to make a drawing or to answer a question and then proceed to the next marker. If children complete this activity in pairs or groups valuable discussions may ensue. Care should

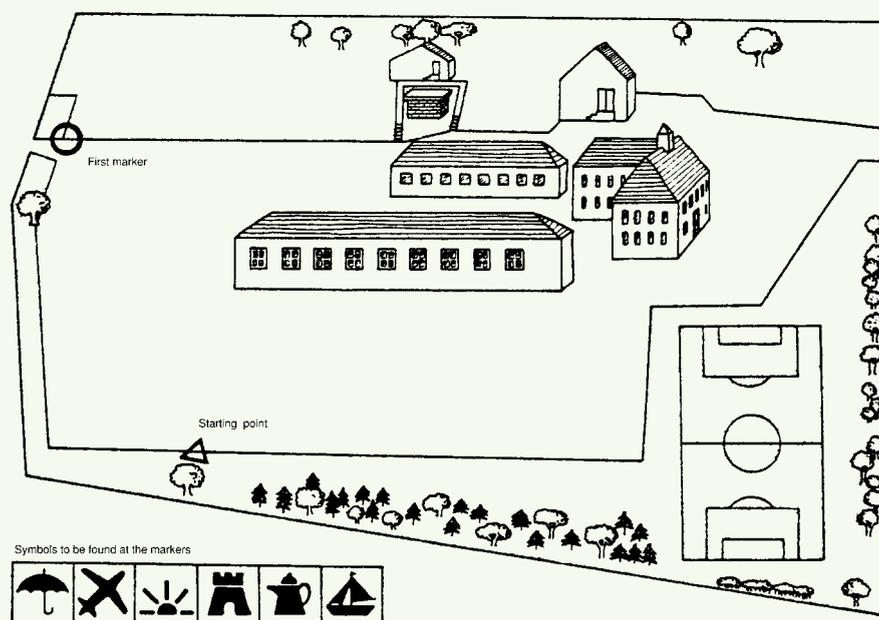
also be taken to ensure that map-reading and recording is genuinely shared among the members of the group.

Comparing pictures and plans

Comparing pictures and plans of an area can lead to very fruitful discussions. Oblique aerial photographs (i.e. those not taken from directly above) can be used for this activity, but other pictures taken from a vantage point such as a nearby tall building or a roof can be equally useful when a relatively small area, such as a playground, a street or a school garden, is under discussion. Ideally, enlarged prints should be used so as to facilitate group discussions.

Linking items on the photograph and map will inevitably lead to the need to align the two documents and identify directions. Routes can be traced on the photograph, for example the way from the corner of the road via the school gate to the entrance door. The selective nature of maps will also become apparent through identifying details in the photograph that are not included on the map.

Smaller photographs of individual features in the environment, perhaps taken by children as they explore the site, can also be valuable. Mounting these on a large-scale plan of the area will involve the use of several mapping concepts and skills.



Orienteering maps for younger children may relate closely to the children's stage of mapping development and show items in both plan and pictorial (iconic) form.

Map work for third to sixth classes

Aims of map work in the middle and senior classes

Map work in third to sixth classes should build on the foundations laid in the earlier years. While the predominant concern of the work in infants and junior classes will be to develop the child's understanding of aerial perspective, a broader range of mapping concepts and conventions will be introduced in the middle and senior years. These will include

- the symbols which are used on maps (such as the use of colour to distinguish land and water or altitude, the various lines used to represent roads or other transport links and other symbols used for settlements and human features)
- the use of a key, in particular those commonly used on Ordnance Survey maps and in atlases
- indexes and simple grid references
- the alignment or orientation of maps
- scale.

Many of these concepts may be introduced and developed as children engage in the construction of a wide range of maps and plans in which they can record and present information about the environments encountered in the geography programme. However, in the middle and senior years an increasing emphasis will be placed on the extraction of information about environments from a wide range of commercially produced maps. Children should develop their map literacy (or graphicacy) so that they can use maps to find out about and interpret the world around them in a critical, informed way.

Access to a wide range of maps

Access to a wide range of maps is necessary therefore in the middle and senior classes. Some of these maps, for example those of small areas in the locality or those of an historic site visited by pupils, may be prepared by the teacher, but most will be commercially produced. Constant reference to and use of maps will be an essential part of many geographical activities and should also form part of scientific, historical, mathematical and PE activities. In this way graphicacy will become an important facet of the child's interpretative and communicative skills.

Among the maps which could be used are:

- architectural drawings and plans of the school and other buildings in the area
- plans of rooms, often published in catalogues of companies involved in the design and fitting of kitchens, bathrooms and bedrooms
- scale drawings of cars, often contained in car review magazines
- plans supplied by supermarket owners to customers detailing the layout of their stores
- town plans, maps of walks and parks, and plans of historic buildings and sites reproduced on tourist information leaflets, guidebooks or notices
- maps of estates and roads, sometimes available from the local planning authority or from builders during the construction and sale of new houses in an estate
- route maps produced by bus, rail and airline companies
- town plans and other maps in handbooks produced by motoring organisations
- street atlases and maps available for larger cities and towns
- a wide range of Ordnance Survey maps of various scales (the available maps and their relative advantages are discussed in more detail in the appendix)
- large wall maps
- atlases
- maps on CD-ROMs and other electronic sources.

Exemplar 11

Making and completing maps

third to sixth classes

Many of the exercises outlined under this heading for the junior classes (pp. 128–133) can be profitably used with older children as well. The activities which follow seek to involve children in map-making situations which have real relevance so that the map becomes a tool which may be used to solve a practical problem.

Mapping the school and playground

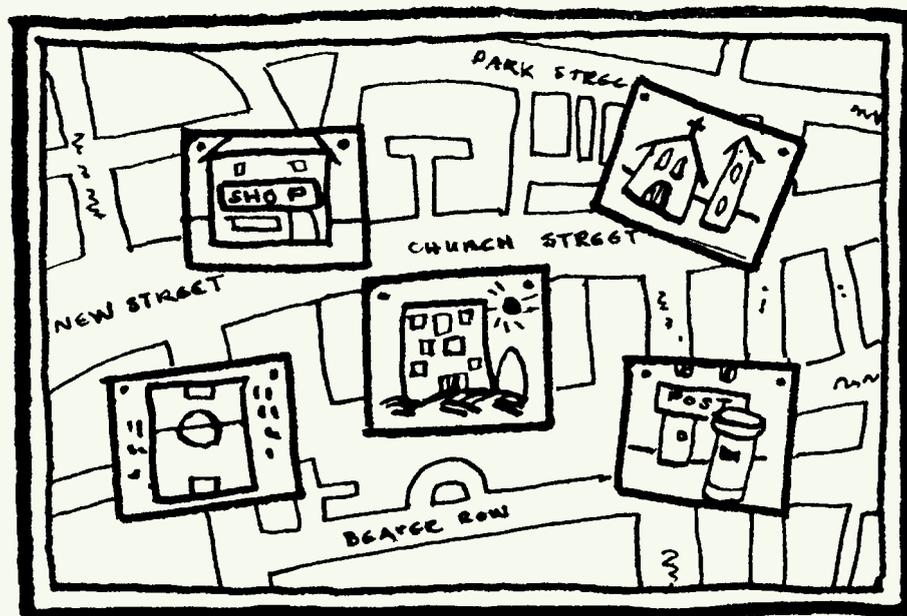
Although a seemingly simple exercise, the making of a map of the school and its surroundings can be a quite demanding task. Normally the child will be unable to see all this area at one time. He/she will have to move around and explore different aspects of the buildings and playground in order to construct a mental or cognitive map. It will then require the use of the imagination to reproduce this in the first draft of a map.

Discussing the first drafts of these maps can help the child to become aware of the relative scale of features (for example the size of the principal's office relative to that of the hall). It can also highlight the selection of features that should or should not be included (for example whether the map should show parked cars). The discussion should then help in subsequent re-drafting of the map.

Linking this exercise to a practical problem can help to make the activity more relevant and can highlight how the content of a map may vary depending on its intended use. For example, children might be encouraged to record and evaluate the evacuation plan for the school in the event of a fire. A map for this purpose will place an emphasis on the location of exits, the likely flow of people leaving the building and possible congestion areas. Map-making may lead to the recording of fire alarm buttons and extinguishers – features that might not be relevant on a map used for a different purpose.

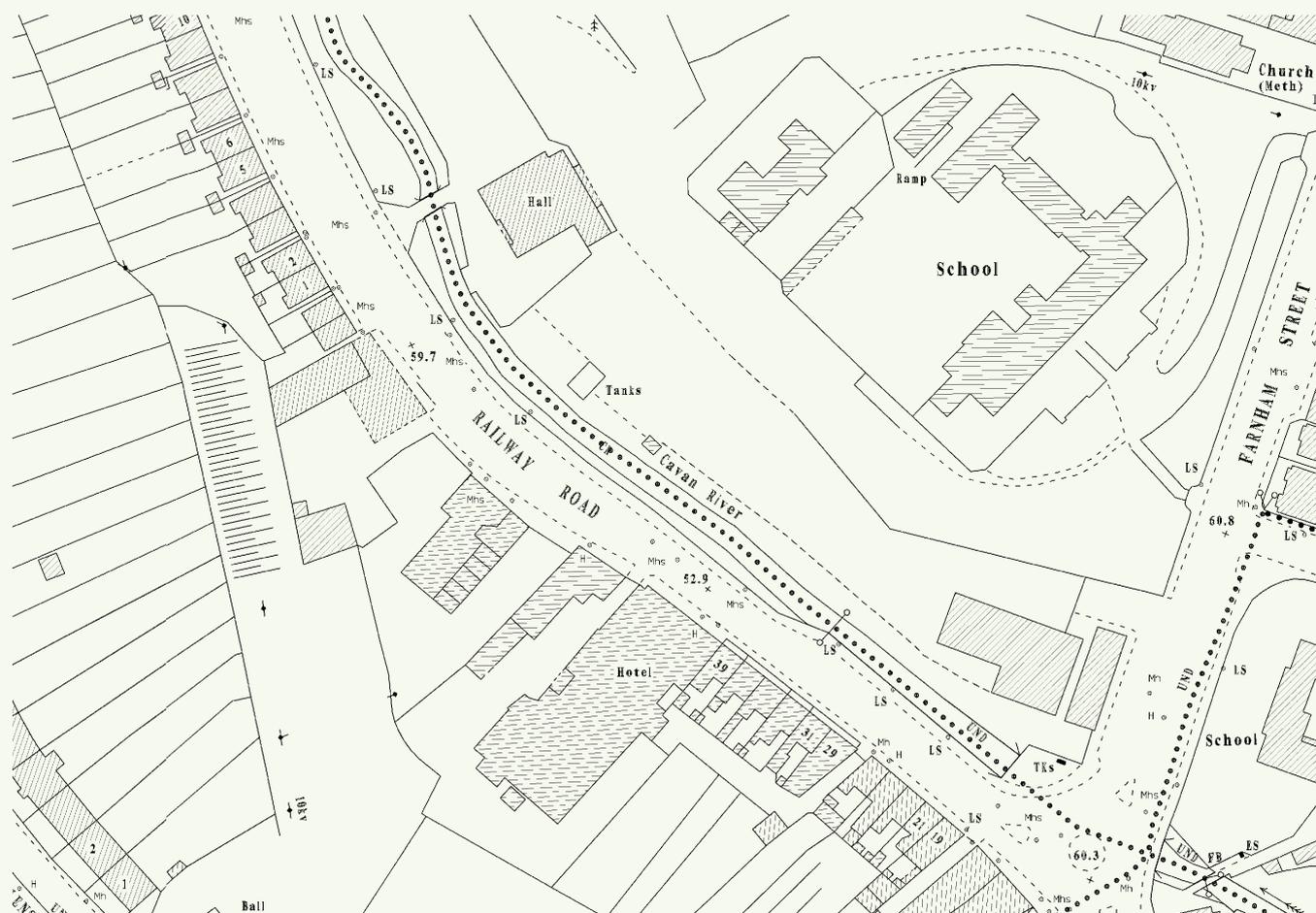
Mapping the local environment

For children in third and fourth classes, a walk around part of the locality will be an excellent way to introduce local studies. Such an exploration can provide the context for the drawing or completion of maps. Children need to be in relatively small groups for this activity to be most productive and a detailed discussion of how this might be organised is contained in the section *Organising fieldwork*.



An initial exploratory walk will be greatly enriched by the use of a blank map of the area. This map, on which the outline of streets, the school and one or two other features should be drawn, could be prepared using a large-scale map of the district. As children walk around the area they should be encouraged to align the blank map with the streets, note the route of their journey with arrows and then record some of the key features to be seen at marked points on the map. For example, children might be asked to fill in the building to be seen at a particular junction, the location of a church, post office, or filling station. One map might be given to each group, so encouraging debate about the map and the locations to be identified but all children should take a turn in holding and setting the map.

Follow-up work in the school can include transferring the information collected to an enlarged copy of the blank map mounted on the wall. On this map the teacher could encourage the use of some standard symbols (e.g. the use of a cross to represent a church) and could ask children to place on the map some photographs of the features recorded. This type of activity can complement the development of the child's sense of place and space as well as his/her map-making ability and knowledge of the locality.



Map based on Ordnance Survey Ireland by permission of Government Permit No. 6768.

Exemplar 12

Orientation

third to sixth classes

Orientation of the map

Children in third to sixth classes will require much time and many opportunities to develop and consolidate the skill of map orientation. Strategies used in the junior classes should be practised whenever maps of small-scale areas are to be used or drawn. The habit of checking the alignment of features and map representations should be reinforced as children move around in the environment.

Children at this stage may also be introduced to orientation using the compass. As children become aware of the position of the rising and setting sun, they will be introduced to the cardinal directions. They should become familiar with the position of features such as the north walls of the room and school, east or south-facing windows (through which the sun shines at certain times of day) and perhaps the eastern and western ends of a neighbouring church.

Compasses are available with large needles on which the north-pointing end is brightly coloured. These are fascinating items for children (and they may also be used in science experiments). Maps of the school grounds or another restricted area need to be prepared on which a number of parallel arrows, coloured to match the colour of the compass needle, are drawn along the map's north edge. The compass is placed on the ground and allowed to settle. The map is now laid out beside it so that the compass needle is parallel to the series of coloured arrows on the map. The map is now correctly aligned and this may be repeated at any location.

Once the technique is understood, orienteering activities similar to those described on p. 132–133 be undertaken using maps on which arrows indicate north. Marking the north edge of maps with a series of arrows (rather than the single north pointer usually used on commercially produced maps) should become a standard feature on the maps used and drawn by children in the middle and senior years. As children become more adept, maps of larger areas may be orientated.



Map orientation using a compass: the map, which may be marked along its north edge with a series of north-pointing arrows, is placed on the ground alongside the compass and adjusted until the compass needle and the arrows are parallel and pointing in the same direction. The variation between magnetic north and true north may be ignored in the primary school.

Exemplar 13

Activities with scale

third to sixth classes

Understanding and using scale

During most of the map-making activities in the primary school the emphasis will be on enabling the child to represent elements of the environment, including aspects such as distance, shape and location, reasonably accurately. The discussion of children's maps can encourage the consideration of the relative size of objects depicted but the accurate measurement of distances and the representation of features to correct scale will not be a major concern, especially in infant, junior and middle classes.

Children will, of course, need to understand the concept of scale if they are to use commercially produced plans and maps. It is best to begin with maps and plans of smaller areas (or objects) drawn to a large scale. Using maps becomes more difficult as the scale of the map decreases: as the scale gets smaller, the actual area depicted may increase but less detail will be shown and the level of abstraction will be greater.

The need for scale

The freehand drawings children make of their classroom and other areas will provide opportunities to discuss the relative size of various features. However, other activities need to be used to introduce the concept of scale. One useful approach is to encourage children to match and compare real objects, such as plates, cups, knives, forks and glasses, with toy models. An assorted collection of toys made to a variety of scales (including dolls or other figures, clothes, tools, cutlery, cups, furniture and cars suitable for use on a playmat) can also be used in sorting activities. Although the scale of these groups of objects may not be identical they involve children in recognising that a proportional relationship exists between the figures and so can help in establishing that representations of the real world vary in size.

First scale maps

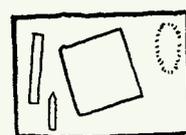
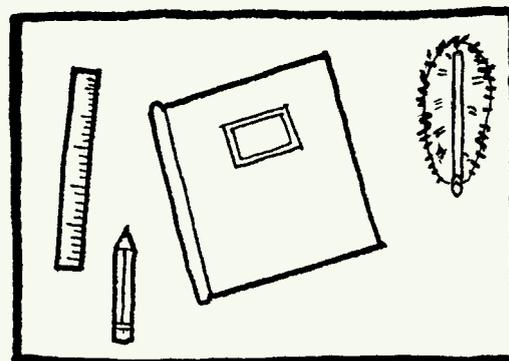
Small items belonging to the child can provide an ideal starting point for more formal work on scale. Using squared paper (e.g. 1 cm² or 2 cm² paper) small, regularly shaped objects such as pencil sharpeners, small boxes, bricks and other items may be measured and drawn at full scale (1:1).

The teacher may then introduce an object which is too long to be drawn on the sheets of paper. Discussing how to solve the resulting mapping problem can lead children to attempt a 'half size' drawing, and this scale (1:2) can then be used for a further range of objects.

This work can be extended by getting the child to draw the top of his/her desk and a number of small objects to scale. The top of the desk can then be mapped by mounting the scale drawings of the objects on the scale outline of the desktop.

The distances from the edge of the desk to the items on the desk can be measured and the scaled distances used to place the representations of the objects in the correct position.

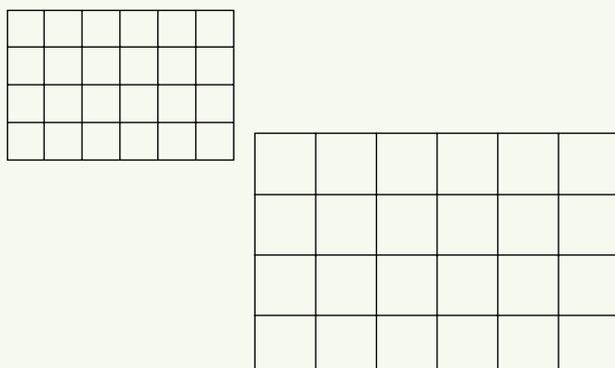
Later maps of larger areas and objects can be attempted and scales of 'quarter size', 'tenth size', etc. may be introduced as children become ready to apply the mathematics involved.



The desktop and a simple map of it

Enlarging pictures and maps

In this activity a drawing, which is divided up into squares, is copied and reproduced by the child on a set of larger squares. Examples of the activity will be well known to children from their inclusion in drawing and puzzle books. As children's understanding of scale develops, they can learn to repeat the exercise using squared paper of various sizes and compare the results.



Scale in the classroom

The classroom will also provide a limited area which may be represented in scaled drawings. The following activity could be used to introduce the connected concepts of ratio and scale.

The teacher could prepare a scaled drawing of the classroom and its main items of furniture using a scale of 1:25 without writing the scale on the plan and distribute copies of it to the children. Questions and discussion can ensure that children understand what is shown and can orientate the map correctly. The pupils can then be asked to measure distances on the map and the same distances in the room: for example, the distance from the teacher's desk to the wall might be 50 cm in the room and 2 cm on the map. When a number of these distances have been measured discussion should lead pupils to realise that a consistent relationship exists between distances on the map and those in the room. They can then measure further distances on the map, calculate what the real distances will be and verify them by measurement.

A further development of this exercise can be to draw a scaled ruler on a slip of paper on which each 1 cm mark is labelled as 25 cm. This paper scale can then be used to read off distances on the plan.

Scaled maps

As the child's mathematical development in fifth and sixth classes makes possible the handling of ratio and scales, the use of scales such as 1:1,000 and 1:2,500 should be explored. These are relatively difficult concepts and much practice will be required before the child can understand that 1:1,000 means that 1 cm on the map represents 1,000 cm or 10 m on the ground. Maps using these scales are available from the Ordnance Survey and these large-scale maps will be ideal for the exploration of the school and its immediate surroundings. These maps could be used to measure distances, to establish whether a certain area of the playground could be used to accommodate a basketball court or to estimate the cost of re-laying asphalt. Distances between locations in the locality could also be established.

The street maps available for larger cities and towns tend to use the scale 1:9,000 (or 1:15,000 in the case of Dublin). This translates into 1 cm representing 90 m (or 150 m) – distances that can be envisaged by primary school children. However, the use of smaller-scale maps is considerably more difficult for the child to grasp accurately. The Ordnance Survey's *Discovery Series* maps will be useful for the examination of regions in counties as their scale of 1:50,000 (or 1 cm representing 0.5 km) is relatively easy to calculate but the calculation of distances on smaller-scale maps will not normally form part of the primary school programme.

Exemplar 14

Co-ordinates and grid references

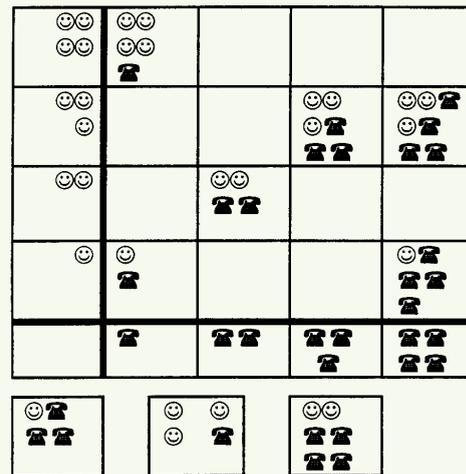
fifth and sixth classes

Using a simple grid

A variety of grid systems are used in commercially produced maps. Ordnance Survey maps use a grid system in which the country is subdivided into a number of squares labelled with the letters of the alphabet. This system makes it possible to describe the location of every point in the country using a letter of the alphabet and a six-figure reference number. The lines of latitude and longitude constitute another system which is useful for locating places on small-scale maps in atlases and on the globe. The simplest grid system, which uses letters along one axis and numbers on the other, is often used in town plans.

Although children will use a wide variety of Ordnance Survey maps in the geography programme, the use of six-figure grid references will be beyond the ability of primary school children. However, the basic concept of describing locations on a map using co-ordinates can be introduced in fifth and sixth classes.

All grid systems are based on the concept of co-ordinates in which locations are described using reference points on horizontal and vertical axes. Work in the mathematics curriculum will complement the introduction of co-ordinate geometry. Although this may not be formally introduced until the senior classes, children will have already used the principles involved in simple multiplication and addition squares and the principles can be reinforced through the use of simple board games.



Simple board games can be used to introduce and reinforce the concept of co-ordinates. Geo-boards and some computer programs may complement this work.

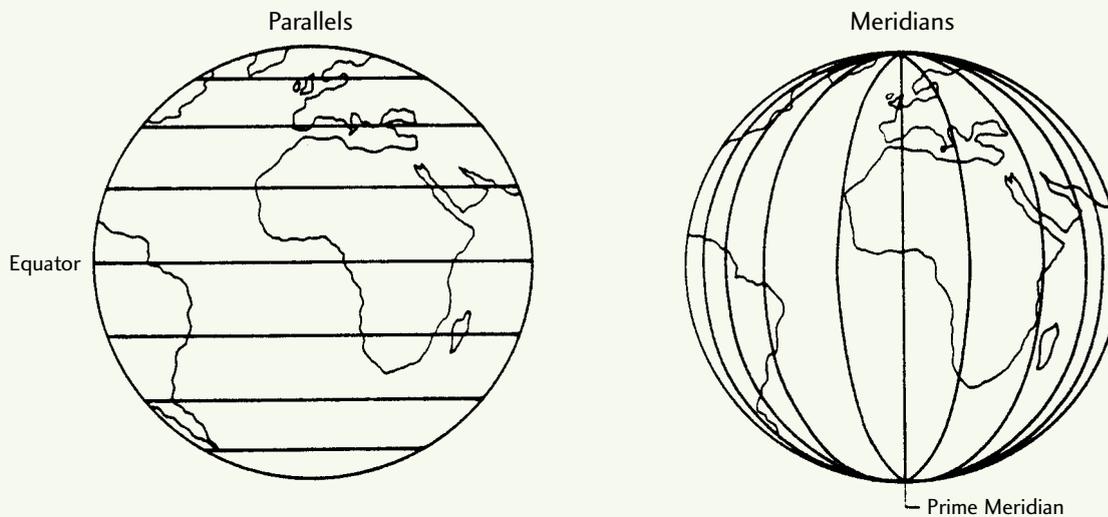
Maps of the classroom, a garden, town or other relatively small area to which a simple grid has been added can be used to reinforce and practise the use of grid references. Numbers may be placed along the horizontal axis and letters along the vertical axis so that co-ordinates such as 3A, 2F etc. will result. Note that the horizontal reference (called the easting co-ordinate on Ordnance Survey maps) must be given first, as this is the convention used on all commercially produced maps.

Workcards can be used to ask children to identify items for which references are given, to compile the co-ordinates for a number of features and finally to use an index so as to locate places on a map. The last exercise can be undertaken using town maps for which street references are given.

Latitude and longitude

Developing children's understanding of simple grid systems will make them aware of the lines they see on atlas maps and on the globe. They can be taught that these lines form another grid system. However, the geometry involved in understanding meridians of longitude and parallels of latitude is beyond the capacity of most primary school children and is therefore excluded from the curriculum. Work on latitude and longitude

should be confined to making children aware of certain key lines of latitude and longitude on the globe such as the Equator, the Tropics of Cancer and Capricorn, the Arctic and Antarctic Circles, the Prime (Greenwich) Meridian and the International Date Line. The longitude and latitude of Ireland may also be examined and it may be possible to compare the variations in time at locations around the globe.



Children in fifth and sixth classes should recognise some key lines of latitude and longitude on the globe but will not generally use longitude and latitude on maps.

Exemplar 15

The past and the future in maps

third to sixth classes

Maps, photographs and a sense of time

Any map of an area is an historical document. It records the features of a place as they were when the map was drawn and, as with other historical documents, it can provide evidence of the interests and perspectives of the cartographer. Aerial photographs also provide an historical summary of the landscape but, unlike maps, they record everything that is visible in the landscape from the altitude at which they are taken. It is important that children are made aware of these characteristics so that they can view and evaluate maps and photographs in a balanced way.

Even relatively modern maps may not accurately reflect the area they represent. In urban areas, particularly, the construction of new buildings and roads often renders many maps out of date almost before they are published. Having opportunities to examine large-scale maps and town plans made five or ten years ago and comparing them with more recent maps and/or aerial photographs will enable children to recognise instances of change and continuity in the landscape. This can be especially illuminating for children, who often believe that all things which existed before they were conscious of their environments are equally old. Interviewing an adult who remembers the landscape before and after the changes noted will enrich this activity

further by throwing light on some of the reasons for change and the impact which it had on the lives of people.

Similar work is possible in rural areas. Here, maps from the 25-inch and 6-inch Ordnance Survey series will have recorded features as they existed in the nineteenth and early twentieth centuries and these maps may have been updated at particular intervals. Children should be taught to check the date of these and indeed of all maps and photographs. As in the case of urban areas, some features will have disappeared (for example hedgerows or ring forts), some may have been altered (for example the line of a road) and some will be completely new (for example reservoirs, farm and other buildings).

This activity can also help children to link what may be, to them, completely unrelated features. For example, sections of embankments, isolated bridges and some stone-built dwelling houses may appear as unrelated items in the landscape but on an old map they will be shown as elements of the railway line now closed and lifted. The isolated embankments may have been broken by new roads and other buildings or levelled for farming but the sections which remain can be pieced together by the child on the older map and the line of the railway connecting several places traced. In doing so the child will have simultaneously enriched his/her sense of place, spatial awareness of the locality and sense of time.



The selection of map content and other details can indicate the perspective and interests of the cartographer, as in this 14th-century European illustration of people in other lands (a drawing by Sebastian Munster published in *Cosmographic Universelle*). Images such as this reflected the European belief that the inhabitants of other continents were not fully human.

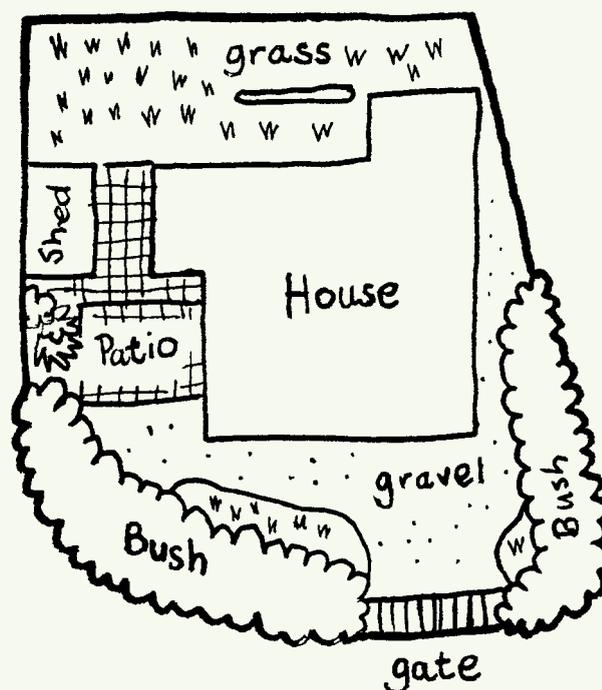
The construction of maps inevitably involves selection and abstraction, processes which are influenced by the purpose of the maps and by the concerns and interests of the cartographer. An exaggerated example of this may be seen in the maps and accounts of the Americas compiled by Europeans shortly after their arrival in that continent. These included grotesque images of native people, reflecting the European belief that these peoples were not fully human. Comparing the maps of the world drawn in the fifteenth and sixteenth centuries with those available to us now also demonstrates how our knowledge of the world has expanded. However, it is important for children to realise that places existed even though they are not recorded on the older maps, that it was a lack of knowledge on the part of Europeans rather than the non-existence of peoples and civilisations that led to errors on the maps.

These cases provide glaring examples of bias but it is important to realise that our modern maps are also the result of subjective choices. Maps which appear on picture postcards and on tourist promotional material, for example, may include sites of interest to visitors and physical features but exclude other items such as industrial sites. This may be justified on the grounds of the needs of tourists but how accurate a portrayal of the place is contained in the resulting map and its accompanying illustrations?

Maps and the future

Maps have a further quality to which children should be introduced: they allow us to imagine and envisage the future. The solution to a practical problem or the effect of a proposed project can be discussed much more readily if we use maps and plans to envisage its scale, situation and likely impact. For example, if an extension is to be built to the school or the internal use of rooms is to be altered, children could be asked to propose their ideas for the alterations. Children in fifth and sixth classes who can work readily with scale can test out ideas: for example, they could establish whether a conventionally sized classroom could be fitted into a specific section of the yard.

The planning of school gardens or a play area for infants can also become the subject of map work and can then be tested through the construction of scaled models in a designing and making task. Similarly, maps can be used if an environmental issue such as road safety near the school is to be resolved. Maps can assist in the analysis of the problem: for example, maps can be used to establish from what direction most children approach the school and where most need to cross the road. Alterations to road signs or the installation of a pedestrian crossing or cycleway can then be plotted on the map and analysed.



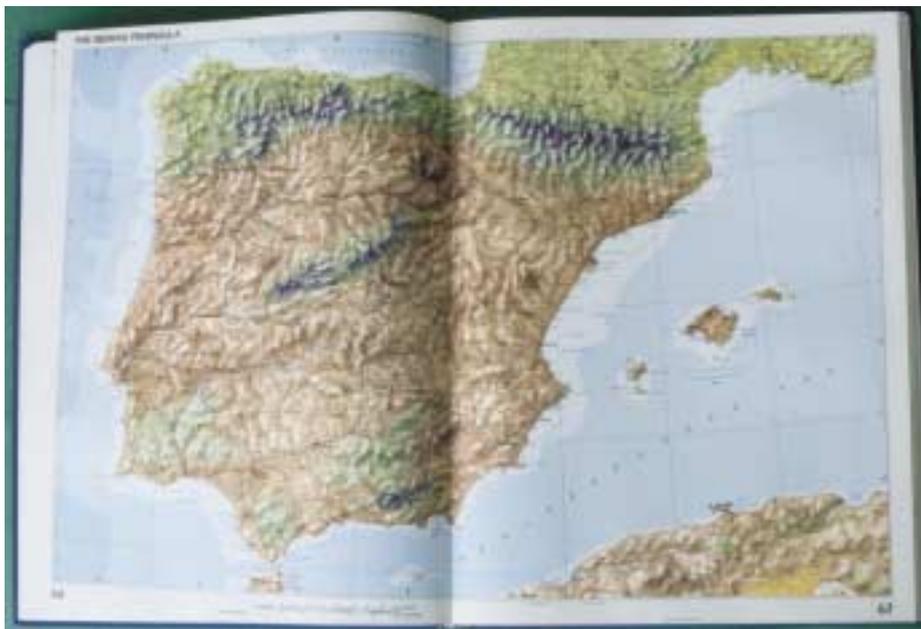
Maps can allow us to imagine and plan the future appearance of part of the environment such as a school garden or the use of spaces around one's home.

Atlases, globes and map projections

Atlases should become a normal tool of reference for the primary school child.

Atlases

Atlases have been a traditional resource in the teaching of geography and should be available at all levels in the primary school. However, it should not be assumed that a familiarity with large-scale maps and plans will necessarily equip the child to use an atlas. Children will need to be taught how to interpret efficiently the information contained in the atlas.



Atlas maps which attempt to show the actual natural environmental conditions and altitude using a model or relief effect may be useful in helping children to understand the surface features of an area.

Atlases tend to use small-scale maps which show relatively large areas of land and sea but in doing so they have to rely on a high degree of abstraction. While a large-scale map such as a 1:1,000 plan of the locality can show recognisable outlines of buildings and streets, an atlas map will generally represent an urban area with a single round dot.

Atlases also compress a great deal of information on a single map: for example, it is typical to find major political boundaries, natural features such as rivers and mountains, urban areas and transport links on the same map. Even where political and natural features are shown on separate maps different categories of features are indicated using various styles of type, and words are often printed in close proximity to each other. On maps of physical features the use of colour to represent altitude can add to the confusion. For example, since the child tends to equate green with fertile areas much of the Sahara can appear to be covered with luxuriant growth.

Choosing and using atlases

The following issues should be considered when choosing and using atlases:

- atlases in which maps are crowded with detail should be avoided
- lettering in clear and easily distinguished type will have a very significant influence on the accessibility of atlas maps for children

- the legend or key should appear on all pages, not just in a special section at the beginning of the atlas
- the inclusion of 'globe-style' maps of the world and satellite photographs (as well as other world map projections) will help the child to appreciate the link between the atlas maps and the globe
- large-format or 'big book' atlases are available for infant and junior classes. These can be very useful in group discussions with younger children
- some atlases are available with prepared transparencies for overhead projectors so as to facilitate the location of places and the discussion of maps
- most atlases will have maps of political and physical features. However, some atlases include a third type of map, sometimes called environmental maps, in which the natural vegetation (or potential natural vegetation) is illustrated and special printing effects are used to show altitude in 'relief'. These maps can give pupils a much better concept of what the actual surface of the land looks like and their inclusion should be considered when purchasing an atlas
- all atlas maps will show latitude and longitude but the use of a simpler grid system, such as an alphanumeric grid, will make the maps much more accessible to children. The index of the atlas should also use this system, perhaps in addition to the use of latitude and longitude
- atlases should become a normal tool of reference for the primary school child. The names of places arise frequently, both in discussions and in the life of the school. They will arise in such contexts as the discussion of news items, the arrival of visitors in the school, the collection of money for charities working abroad or the departure of a pupil to another school. These occasions provide opportunities to refer to the atlas and to record the location of the place on a large wall map. At times the limited level of detail included in primary school atlases may, infuriatingly, fail to include the particular location in question but this can also be an advantage as it demonstrates the selective nature of the atlas. It may necessitate consulting a more detailed atlas and/or an electronic atlas available on CD-ROM

- often children fail to realise that the large-scale maps they use in local studies are simply sections of the atlas maps in their atlases. Atlases will not include maps of sufficiently large scale to be useful in studies of the locality or of other limited environments in Ireland and so the use of 1:1,000 or other large-scale maps becomes essential. However, it is a good practice to encourage children to find the area depicted in large-scale maps (for example the section of a county depicted on a *Discovery Series* map or the boundaries of a full county) on the smaller-scale maps in an atlas. Similarly, large-scale maps may be used for studies of places in other countries but the location of these should also be identified on atlas maps
- the scale to which atlas maps are drawn varies enormously within the atlas. For example, the maps of Ireland and perhaps of countries in Europe will generally be drawn to a much larger scale than those of Africa or Asia. Unconsciously this may lead to a very distorted view of the world and of the size of different regions relative to their importance. This can be ameliorated to some extent by the inclusion on each page of a small map of Ireland (or Europe) drawn to the same scale as the main map
- many schools will choose to use a standard atlas for each class. These may vary from level to level in the school but within each class all children will use one atlas. This has obvious advantages for class work and discussions but children should not be confined to one atlas. Having access to other atlases can lead children to compare various representations of the same area. Questions can be raised about the items that are included on one atlas yet absent from the other. This will have important consequences for the child's view of atlases. Often children believe that a place or feature does not exist if it is not shown on the atlas and the opportunity to compare maps will help the child to realise that atlas maps are selective.

Globes and map projections

A globe provides the most accurate representation of the Earth. Images of the Earth taken from space have become common-place in books, in pictures and on television and have accustomed even quite young children to the spherical nature of the planet. This awareness should be reflected in geographical work in the primary school and children should have ready access to globes from their earliest years in school. At times we may under-utilise globes and resort to using maps when a globe would present a much more realistic impression, both of the relative location of places and of the relative importance or size of countries and other areas.

A wide range of globes made of different materials, and to different scales, is available and the curriculum outlines how these may be used at each level in the school.

Choosing and using globes

The following issues need to be considered when choosing and using globes:

- like maps, globes may show political divisions, natural features or landscape and environmental features. As with maps, children will need to be introduced to the symbols (such as lines and colours) that are used on the globe. Globes which show a limited degree of detail and allow the child ready access to basic geographical information are essential
- in some cases the surface of the globe may be modelled so as to represent mountain ranges and lowland areas using relief. These can have many of the same advantages as the environmental maps discussed in the preceding section
- as with atlases, access to a range of globes is important. Children should not be left with the impression that the Earth is covered with the patchwork quilt of coloured areas displayed on a globe showing political demarcations. The use of globes showing natural features is important and by comparing a range of globes it should also become clear to the child that a degree of selection has been exercised in their construction

Using globes: skills outlined in the curriculum

for infants

- become aware of globes as models of the Earth

for first and second classes

- identify land and sea on maps and globes
- use maps of Ireland and the globe to develop an awareness of other places

for third and fourth classes

- identify major geographical features and locate places on the globe

for fifth and sixth classes

- compare maps, globes, aerial photographs, satellite photographs and other remotely-sensed images
- recognise key lines of latitude and longitude on the globe

Equator, Tropics of Cancer and Capricorn, Arctic and Antarctic Circles, Greenwich Meridian, International Date Line, latitude and longitude of Ireland

- develop some awareness of problems of map construction

*effect of various map projections on relative size of countries
importance of perspective and bias in map construction*

- large plastic inflatable globes are much less expensive than those made from rigid materials and are very suitable for use in infant and junior classrooms
- in the early years, children's appreciation of the globe as a representation of the Earth may be fostered through the use of satellite photographs. The photographs, 'globe-like' maps and globes should be examined and discussed together
- as places arise in discussion there should be frequent reference to the globe. In the early years, especially, washable felt-tip pens can be used to mark locations found on a plastic globe. In the middle and senior years work with the atlas and globe should complement each other so that children are constantly reminded that the maps in their atlases are simply sections of the globe

A range of globes

- inflatable plastic globes
- rigid or solid globes mounted on stands
- small desk globes
- pencil-sharpener globes
- globes on key-rings
- globes on plastic or rubber balls
- erasers in globe form
- globe cushions
- wooden globes as furniture in historic houses or in reproduction furniture shops
- globe simulations on CD-ROMs

- inflatable plastic globes may be used in games designed to enhance children's locational knowledge. For example, working in pairs or small groups, a child may pass or spin the globe to a second child while calling out a place-name. The receiver must locate the place on the globe before spinning or passing the globe to the next child
- it can aid the child's understanding of the connections between the globe and world maps if he/she has access to a relatively small desk globe when first comparing it with world maps in an atlas. Such a globe will be of a similar scale to the maps in the atlas so the sizes of features will correspond roughly on the globe and map
- latitude and longitude should be introduced to the child using the globe rather than maps. The nature of these circles is grossly distorted on the small-scale maps to be found in atlases. Parallels of latitude are not equal in length, as they decrease in size as one moves north or south of the Equator, yet on most maps they appear to be equal in length. Meridians of longitude, on the other hand, are all of equal length, each circumscribing the Earth through the poles. All meridians meet at the poles but on many maps they appear to be parallel to one another. Moreover, the mathematics underlying the drawing of the lines of latitude and longitude are beyond the competence of the primary school child.

For these reasons, it will be sufficient for children to recognise some of the key lines of latitude and longitude (as the curriculum outlines). These can then act as points of reference for the child as other places are discussed. For example, areas of rainforest will be found at or near the Equator and countries adjacent to the Arctic Circle will have colder climates. Similarly, the Prime (or Greenwich) Meridian and the International Date Line will be encountered in discussions of the Earth's movements in relation to the sun.

Exploring map projections

A spherical Earth and a flat map

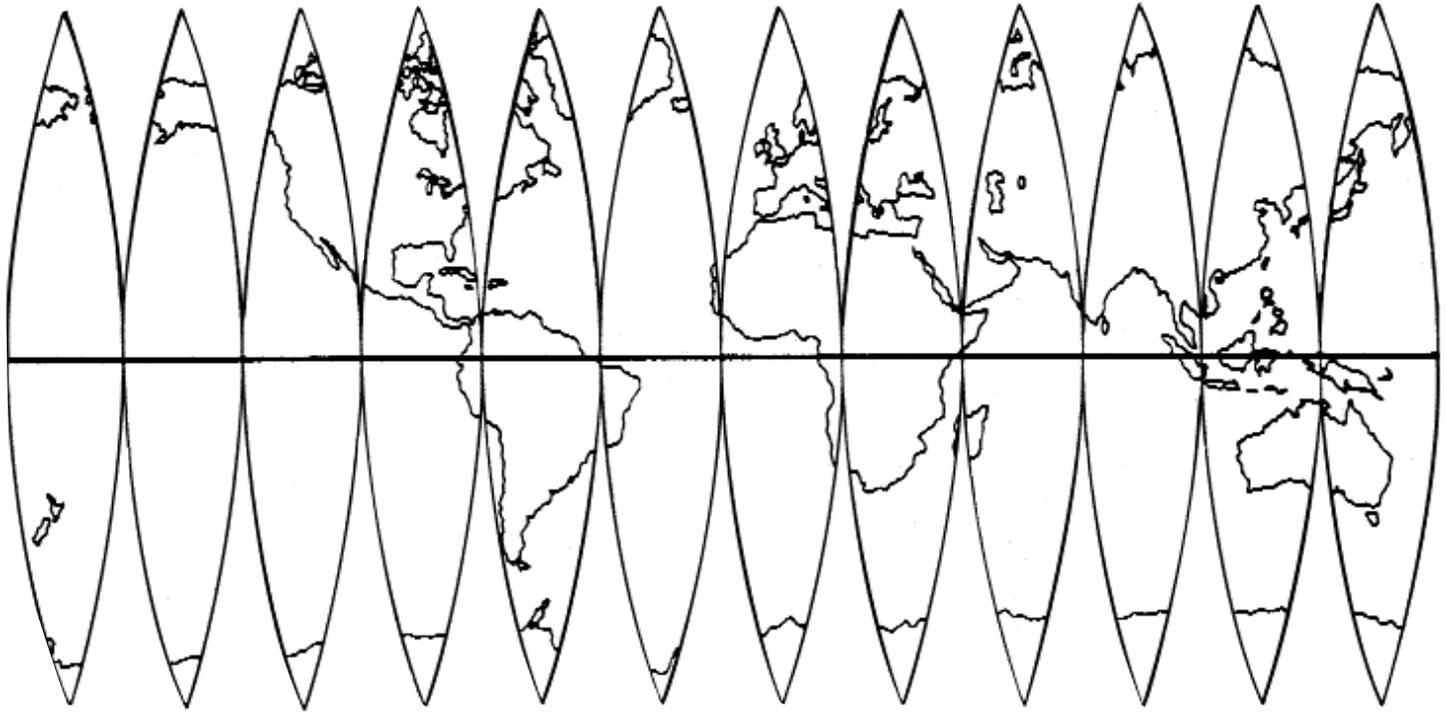
The perceived authority of maps and atlases often makes us prone to accept their contents in an unquestioning manner. However, all maps contain certain levels of inaccuracy because it is impossible to represent the spherical nature of the Earth other than on a globe. Children in primary school will be unable to understand the mathematics and geometry used by cartographers to overcome the problem of representing a three-dimensional landscape on a two-dimensional surface. However, they should be made aware of the problem because the solutions used to construct acceptable maps result in considerable distortion of the map contents and of our view of the world and its peoples.

The difficulties faced in attempting to represent the global surface on a flat map are most easily illustrated through using an old inflatable plastic globe (or failing that a burst football). It will be impossible to spread the deflated globe evenly on a flat surface and children may be encouraged to suggest solutions. Cutting up the globe, ideally along lines of longitude, will permit the flattening of the shape, as in the picture overleaf, but the resulting map would not be very easy to use.

An awareness of map projections

Cartographers have adopted a number of strategies to produce acceptable maps. These seek to represent the *true shape* of the continents or seas, or the *true area* of a part of the Earth, or *true relative direction*. It is impossible to represent all three characteristics accurately on the same map, so that each map projection sacrifices the accuracy of one characteristic in order to embody the qualities the cartographer desires.

Some of the most commonly used map projections are described below for teachers. The basis on which these projections are constructed will not be understood by children in fifth and sixth classes, but pupils of this age should be made aware that different projections have been developed and that all are inaccurate in some respect. In this way children should be encouraged to become more critical of the maps and images presented to them in geography lessons and in the media.



Cutting up an old inflatable plastic globe will illustrate some of the problems involved in map construction.

The basis on which map projections are constructed will not be understood by children in fifth and sixth classes.

However, these pupils should be made aware that different projections have been developed because the resulting maps can distort our view of the world and its peoples.

Common map projections are:

- Mercator's projection: designed by the Flemish geographer Gerhardus Mercator (1512–1594). This projection, which was used by navigators, preserves true direction and allows the setting of accurate courses using compass points. However, parallels of latitude are shown to be of equal length (while in fact they decrease in size in the higher latitudes) and the distance shown between parallels increases towards the poles. This means that areas furthest from the Equator (including Europe) are exaggerated in size. Children could be asked to compare the relative sizes of Africa, Greenland, Europe and Australia on the globe and on this map projection and then speculate on how this might have influenced our view of the importance of Europe and Africa
- Peters' projection: this is an equal-area projection designed to ensure that the true relative area of different sections of the globe is represented accurately. This projection addresses the exaggeration in the size of areas such as Europe in the Mercator projection, hence its popularity in development education. Compare, for example, the relative size of Europe and Africa on Peters'

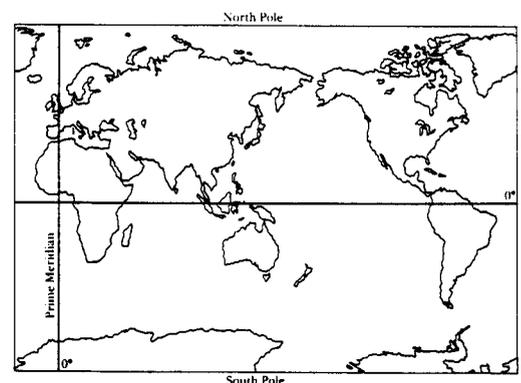
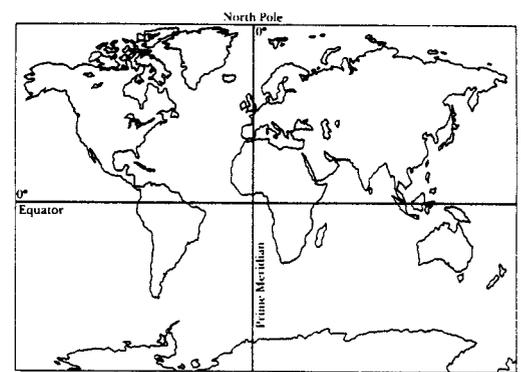


World map projections: A–Mercator's projection, B–Peters' projection, C–Mollweide's projection, D–Gall's projection. Children can compare and contrast locations, the shape of areas and their relative size on the maps and on the globe. The difficulties encountered in representing the sphere on maps will become very evident and the arbitrary nature of maps should become apparent.

projection and on a Mercator map. Similarly, a map of natural vegetation using Peters' projection would provide a much clearer sense of the relative areas covered by rainforest, tundra, desert, temperate grassland, etc. However, this area accuracy is achieved at the expense of the shape of different features, as comparisons with the globe will demonstrate

- Mollweide's projection: this is an equal-area projection in ellipse form designed by Karl Mollweide (1774–1825). Scales along the Equator and the other parallels are constant and so the shape of the continents is portrayed more accurately than on Peters' projection. However, the outer areas of the map are 'warped' and some distortion of the Equatorial area also occurs. By choosing to place the centre meridian of this map at the area of most interest, the worst effects of this distortion can be avoided but the outer parts of the map will always be distorted to some extent
- Gall's projection: this map attempts to reach a compromise between true shape and true area and is frequently used in schools. It is probably the best all-purpose projection for general classroom use but it is important for children to realise that it too cannot be completely accurate.

Authors, particularly those interested in development education, frequently point to the habit of centring world maps on the Prime Meridian so that Europe appears to be at the centre of the world. It is suggested that this can lead to an unconscious 'Eurocentric' view of the world. Whether true or not, it can be illuminating to show children other world maps such as those used in American schools (on which the American continent tends to be at the centre) and those used in Australian schools (where the map is centred on the Pacific Ocean). A discussion of these maps might lead children to suggest why these various arrangements are used and whether they may influence our view of our own place and of the environments of others.



Using information and communication technologies

Information and communication technologies can be a greatly enriching resource in the teaching and learning of geography. Among the ways in which they may be used are the following:

- data-handling programs can be used by children to record and analyse substantial records or bodies of information. For example, children might enter data collected about traffic flows, the use of land areas, weather observations or other geographical phenomena into a data-base. The computer may then be used to analyse the information, look for patterns and present the findings in graphical format
- many programs are available to introduce children to mapping concepts. Some of these allow children to look at scenes and then to view the area in aerial perspective. Children may be required to match items in the scene with their representation on the map and the complexity of the task may be varied to cope with the different learning speeds of individual pupils. Some of the best of these programs supply the child with a map and a set of instructions for completing a journey: the child may then attempt to complete the journey using the map and at each stopping place the computer allows the child to look at the view to the north, south, east and west. In this way the child is encouraged to relate the 2-D map representation to the 3-D environment in the context of a game



Several computer programs offer new ways to learn and practise mapping skills.

Weather Record	
Date 5 Nov.	Time of reading 09.30
Cloud type cirrus cumulus ✓ stratus	Amount of cloud none quarter half three quarters ✓ all sky
Temperature 12°	Rainfall amount 10 mm
Wind direction SW	Wind speed Force 4
Conditions Raining heavily, puddles in yard, very dark.	
Observer	Tom

Data from regular weather observations, such as those above taken by a sixth-class child, can be entered into a simple data-base program; graphs and charts may be produced and patterns analysed.

- word-processing and drawing programs give the child another means of communicating his/her geographical findings. By allowing redrafting, editing and correction to be completed so readily, computers can encourage the child who may not find conventional written work satisfactory
- information technology can greatly enrich the range of sources and information available to the child. Many CD-ROMs which include information about a wide range of environments and the peoples and other living things to be found there may be used. CD-ROMs also include environmental sounds and provide an added dimension to the sense of place which may be explored by the child. Many reference books are available in CD-ROM format
- a growing range of atlases is becoming available in CD-ROM format. These atlases can store a much greater range of maps than conventional atlases and have the added advantage of allowing pictures and other data concerning places to be included
- weather-recording instruments which may be connected to and monitored via a relatively simple personal computer are available. A set of electronic instruments to record maximum and minimum temperature, atmospheric pressure and wind speed and direction in this way is available for school use. While such equipment is likely to be beyond the resources of many primary schools, teachers may find that it is in use in post-primary schools, and sharing of the data collected may be possible
- using the internet can give children access to an even greater range of sources. An increasing number of interpretative centres, industries, organisations, charities and NGOs, meteorological agencies, embassies, government departments and other bodies have web pages and children can 'visit' these via the computer
- the internet can also give children an added incentive for geographical research. Some schools have established links with other schools and classes and have shared details of their projects and investigations via e-mail. For example, children can share and compare weather observations using this method.

Looking at children's work

Children's work

Children's participation in a broad range of geographical activities will provide a flow of information about their progress in achieving the objectives of the curriculum. This information is crucial to the teacher's professional judgement about how successfully pupils are learning in geography and in enabling him/her to help children to learn more effectively. A number of techniques will be used in collecting and recording information about pupil progress in geography. Each has its contribution to make in assisting the teacher in assessing progress, identifying difficulties, communicating to the pupil, parents and others, and in planning further learning for the child.

Teacher observation

The details of children's learning which teachers notice as geographical topics are explored and taught provide essential and immediate information about each child's progress. Observations may be made as children undertake tasks or explorations, engage in discussions, interact with the teacher or receive guidance and help. Although watching children's reactions and activities during geography work will provide information about their grasp of geographical knowledge, observations are particularly valuable in assessing the extent to which children have developed appropriate skills and attitudes.

Some of the details of children's learning which emerge may do so in a spontaneous or incidental way; at other times teachers may decide to systematically look out for particular behaviours, abilities or interactions. It is not possible to assess all the available information about pupils' learning so it can be useful to identify particular children or groups whose work might be the focus of observation. Clarifying in advance the expected outcomes of the learning situation will also help to enhance the observations made.

For example, a lesson in which children are required to navigate around the classroom, school or playground using a simple map will enable the teacher to recognise those children who have difficulty using the map as a purposeful tool in contrast to those for whom the alignment and reading of the map poses little difficulty.

Much of the information gleaned through the teacher's observations will not be written down but noting significant aspects of some children's progress or gaps in their geographical knowledge and/or skills may help in the planning of future work for the individual, group or class. Notes might be kept in a simple notebook or diary or on a sheet for the topic, group or class involved. Teachers' observations complement other assessment tools to produce a much more comprehensive view of the child's learning in geography.

Teacher-designed tasks and tests

Teachers will use a wide range of activities to introduce children to the units of the geography curriculum, to allow them to learn about aspects of the topics involved and to reinforce knowledge and skills acquired. The activities will include observing and exploring in the environment, the examination of pictures, maps, plans and other sources of geographical information, oral discussions, asking and answering questions, and recording and communicating in oral, pictorial, model, written and computer formats. The active learning situations in which these will take place can be used to assess the progress of individuals and groups and can be especially useful in evaluating children's development of skills and attitudes.

The way in which children complete investigations in the environment will provide much crucial evidence of learning in geography. The extent to which children have grasped geographical knowledge and skills will be evident from the ways in which they observe accurately, annotate drawings, ask pertinent questions, suggest hypotheses and make assessments and judgements from the evidence available in their surroundings. Children's behaviour in the environment and the concern they demonstrate for its care will be indicative of the success of the programme in cultivating a sense of responsibility for the environment and in stimulating pupils into becoming

active participants in caring for and improving their surroundings.

Tasks completed in the classroom also provide important assessment information. The critical skills which a child may apply to information obtained from the internet or from books will be important, as will the child's facility at abstracting details required from maps or other sources. Children's willingness to suggest and test ideas about the events they observe or the materials they handle will be indicative of their learning, not only in geography but also in science. Children's pictorial and written work and their communication in other forms such as maps, plans, photographs and computer files should provide opportunities for them to demonstrate what they know and understand about the local and wider environment and what geographical skills they can apply. An analysis of the maps and plans children draw, for example, can give some indication of the level of sophistication achieved in the child's developing sense of place and space.

Work samples, projects and portfolios

The collection of samples of the children's work in portfolios provides one of the most important tools of assessment in geography and SESE. Samples from some of the wide range of tasks suggested in the curriculum and guidelines may be compiled by the teacher or older child, enabling balanced monitoring of the child's progress in knowledge and skills to be made in the context of the environments and geographical processes with which he/she is familiar. Samples may be maintained by the child and/or teacher in simple folders or wallets and it should also be remembered that geography scrapbooks and copybooks may be forms of portfolios.

If work samples and portfolios are to assist teaching and learning they must remain manageable and so there is a need to keep only the most significant items. Samples should be retained when they

- show that particular objectives have been achieved, for example at the end of a unit of work
- mark significant progress in the application of a geographical skill, for example, if a child demonstrates the use of aerial perspective rather than oblique views or iconic representation on a map

- indicate a weakness or gap in the child's knowledge or skills, such as a poor understanding of the location of the home area relative to the nearby urban area or a capital city
- indicate significantly greater progress or a breadth of understanding beyond the content of the lessons.

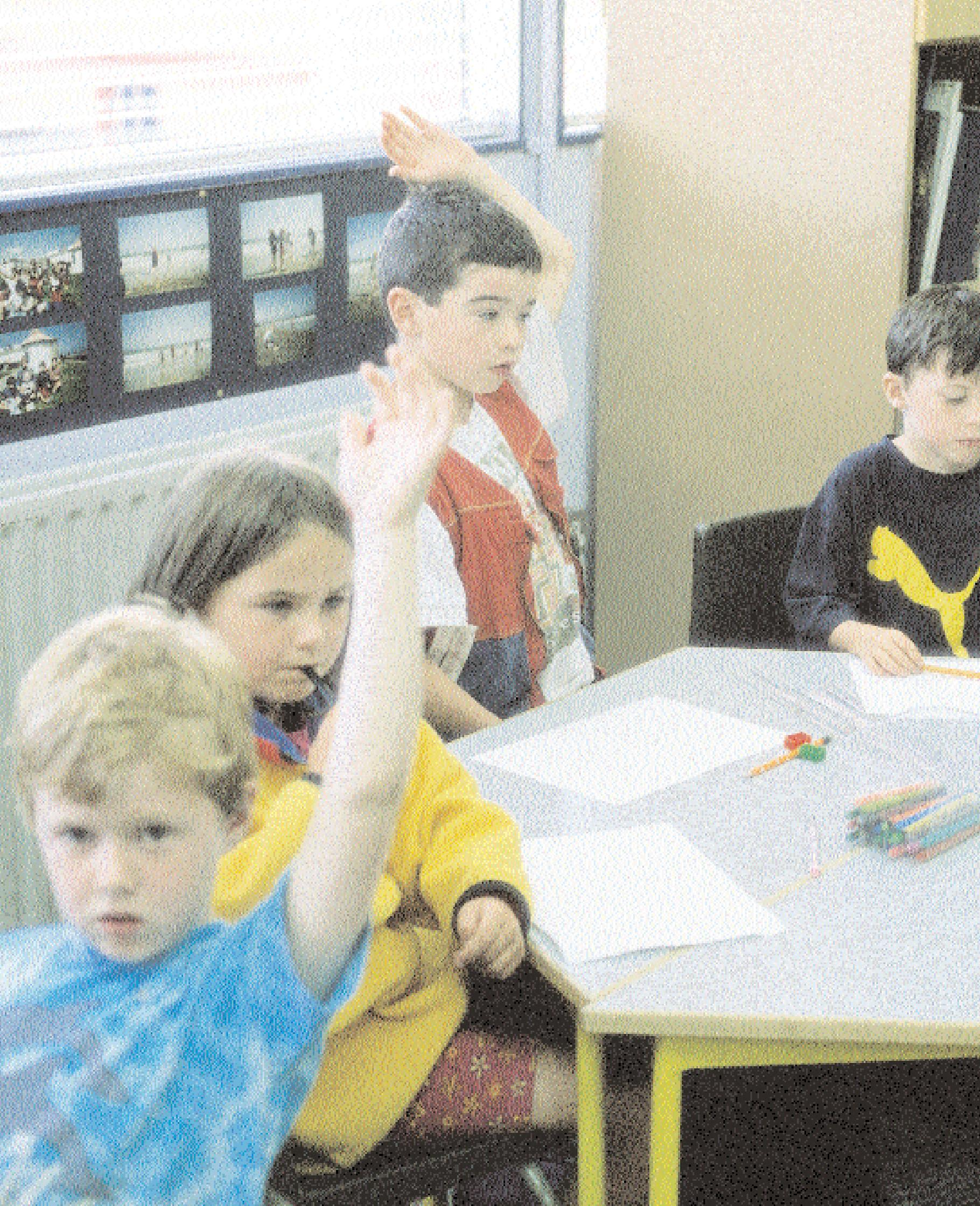
Samples should have attached the name of the child, the date and the help, if any, the child was given in completing the task. The cumulative record of the child's work, some of which may be selected by the child, allows the teacher to make an informed professional judgement about the child's progress and his/her readiness for further learning experiences. It will also provide an excellent basis for reporting to parents and others. The contents of portfolios can form the basis of end-of-term displays for parents and can inform the assessment of the child's progress which is recorded and reported on pupil record cards or pupil profiles.

Portfolios also have a role to play in helping the teacher to review and evaluate the content, methodologies and approaches which he/she has used over a term or year. Work samples which demonstrate the effectiveness of particular approaches or weaknesses in children's learning provide important information for the planning of future work. The analysis of portfolios from a range of children and classes by groups of co-operating teachers could lead to the sharing of teaching experience and the development of a common approach to the assessment of geography within the school and so enhance the reliability of pupil assessment.

Curriculum profiles

Curriculum profiles provide a way in which the child's progress can be assessed and recorded using indicators of achievement. These indicators, sometimes grouped in sets, attempt to summarise the range of knowledge, skills and attitudes which might be expected at various stages in the child's progress.

By marking, highlighting or shading these indicators as they are achieved by pupils, a record may be kept of the child's progress. Reviewing the child's portfolio of work and other tasks completed by him/her will help the teacher to update the profile from time to time and the curriculum profile can provide the information needed for the child's end-of-year pupil profile card.



Section 6

Appendix

Useful maps and books

Useful maps for local studies in the primary classroom

- a large-scale map of the school and its immediate environs, ideally a 1:1,000 map or a 25-inch map
- a large-scale map of the wider environment of the school, for example a map of scale 1:10,000 or a 6-inch map
- *Discovery Series* maps to cover the county

Maps available from the Ordnance Survey

A wide range of maps and other publications is available from the Ordnance Survey Office, Phoenix Park, Dublin 8. All of the Ordnance Survey's map data is held electronically and so maps of most areas of Ireland can be produced at any desired scale up to 1:1000. The following pages illustrate some of the range of maps which schools might find most useful.

1:1,000

This is the largest-scale map available and is compiled from the latest digital information. Most urban areas are covered by these maps but the range is expanding. A 1:1,000 map of an area containing a school would be ideal for map work activities. It shows the detailed outline of buildings, walls, gardens, roads and many other features.

Map based on Ordnance Survey Ireland by permission of Government Permit No. 6768.

DESCRIPTION

Map Scales

1:1000
3391-18



Scale: — 1:64 50 100 0 0 100 Feet
 Scale: — 1:64 50 100 0 0 50 Metres
 50 Metres Ref. No. 20255_3
 Plot Date 27-JUL-1998

An tSuirbhéireacht Ordánáís, Páirc an Fhionnuisce, Baile Átha Cliath, a thionsaigh, a cúlú agus a d'fhoilsigh Complaí, Printad and Published at the Ordnance Survey, Phoenix Park, Dublin. Dianchosc ar mhacasamhlá an iomláin n-ó gan chuid de gan chead roimh ré ó Stiúrthóir Shuirbhéireacht Ordánáís na hÉireann.
 Reproduction in whole or in part is prohibited without the prior permission of the Director of the Ordnance Survey of Ireland.
 © Riailas na hÉireann 1998
 © Government of Ireland 1998

Sample extract from 1:1,000 series

Useful maps and books

1:2,500 (25 inches to 1 mile)

Maps from this series cover all parts of the country but details may not be fully up to date. Nevertheless, these maps show a great deal of detail and will be very useful for the development of mapping skills in the locality. While many items shown on these maps will have changed substantially since the last revision (e.g. road layouts, railway lines, buildings, field boundaries) the existence of these changes will highlight the extent to which the environment evolves and changes. In the absence of a 1:1,000 map, the school should attempt to have a copy of the 25-inch map of the area in which the school is located.

Map based on Ordnance Survey Ireland by permission of Government Permit No. 6768.

1:10,560 (6 inches to 1 mile)

This series also covered all of the country and like the 25-inch series it was based on imperial measurements rather than modern metric scales. Each 6-inch map covers a greater area than a 1:1,000 or 25-inch map and is ideal for use in studies of the wider locality of the school. In most cases a 6-inch map will cover several townlands. If the school is located near the centre of a 6-inch map, then the location of many, of the children's homes may be found on the map. 6-inch maps also show a considerable level of detail (field boundaries, for example, are included) but many of the features shown may well be out of date.

Map based on Ordnance Survey Ireland by permission of Government Permit No. 6768.

1:50,000 Discovery Series

This series of maps, compiled from the latest metric data, covers all of the country and is presented in colour. On average, each county in Ireland is covered by two or three of the Discovery Series sheets, so these maps are ideal for county studies and they complement the 1:1,000 or other large-scale series.

Map based on Ordnance Survey Ireland by permission of Government Permit No. 6768.

City street maps

City street maps are available for Dublin (1:20,000), Cork (1:15,000), and Galway, Limerick and Waterford (1:9,000). These can be very useful for exploring the geography of these urban areas.

Books on the geography of Ireland

The books in the following list will be useful for teachers when researching the geography of their local area. Further books and other sources, including historical atlases, maps and other items, are discussed in the *Appendix of the Teacher Guidelines for History*.

Aalen, F H A, et al.	<i>Atlas of the Irish Rural Landscape</i>	Cork, Cork University Press, 1997
Clarke, Howard	<i>Irish Cities</i>	Cork, Mercier Press, 1995
Geoghegan, Philip, et al.	<i>Building Sensitively in Ireland's Landscapes</i>	Dublin, Bord Fáilte and An Taisce, n.d.
Harbison, Peter	<i>The Shell Guide to Ireland</i>	Dublin, Gill & Macmillan, 1989
McAfee, Patrick	<i>Irish Stone Walls: History, Building, Conservation</i>	Dublin, O'Brien Press, 1997
Mitchell, Frank, and Ryan, Michael	<i>Reading the Irish Landscape</i>	Dublin, Town House, 1997
Pfeiffer, Walter and Shaffrey, Maura	<i>Irish Cottages</i>	London, Artus Books, 1990
Rowan, Alistair, and Casey, Christine	<i>The buildings of Ireland</i> [A projected nine-volume series intended to provide a comprehensive architectural guide to all significant buildings. To date the following are published: North-west Ulster North Leinster]	London, Penguin
Shaffrey, Patrick and Maura	<i>Buildings of Irish Towns</i>	Dublin, O'Brien Press, 1983
Shaffrey, Patrick and Maura	<i>Irish Countryside Buildings</i>	Dublin, O'Brien Press, 1985
Simms, Anngret, and Andrews, J H	<i>Irish Country Towns</i>	Cork, Mercier Press, 1994
Simms, Anngret, and Andrews, J H	<i>More Irish Country Towns</i>	Cork, Mercier Press, 1995

Source references for the curriculum and guidelines

Australian Education Council	<i>Studies of Society and Environment: A Curriculum Profile for Australian Schools</i>	Carlton (Victoria), Curriculum Corporation, 1994
Blyth, Joan	<i>Place and Time with Children Five to Nine</i>	London, Croom Helm, 1984
Bowles, Rachel	<i>Soils, Plants and the Environment</i>	Sheffield, Geographical Association, 1992
Bowles, Rachel	<i>Earth in the Environment</i>	Sheffield, Geographical Association, 1992
Bowles, Rachel	<i>Water in the Environment</i>	Sheffield, Geographical Association, 1992
Butt, Graham, et al.	<i>Assessment Works: Approaches to Assessment in Geography at Key Stages 1, 2 and 3</i>	Sheffield, Geographical Association, 1995
Catling, Simon	<i>Placing Places</i>	Sheffield, Geographical Association, 1995
Convey, Andrew, and Speak, Christine	<i>A European Dimension in the Teaching of Geography: An Introduction</i>	Sheffield, Geographical Association, 1994
Curriculum Council for Wales	<i>Environmental Education: A Framework for the Development of a Cross-curricular Theme in Wales</i>	Cardiff, CCW, 1992
Curriculum Council for Wales	<i>Approaches to Teaching and Learning about Wales at Key Stages 2 and 3</i>	Cardiff, CCW, 1993
Department for Education (UK)	<i>Key Stages 1 and 2 of the National Curriculum (England)</i>	London, HMSO, 1996
Department of Education and Science	<i>The Teaching and Learning of History and Geography</i>	London, HMSO, 1989
Department of Education and Science	<i>Geography from 5 to 16: Curriculum Matters 7</i>	London, HMSO, 1990
Department of Education, Northern Ireland	<i>The Northern Ireland Curriculum: Key Stages 1 and 2: Programmes of Study and Attainment Targets</i>	Belfast, HMSO, 1996
Department of Education, Northern Ireland	<i>Geography: Programmes of Study and Attainment Targets</i>	Belfast, HMSO, 1991
Development Education Support Centre	<i>Guidelines for Good Practice in Development Education</i>	Dublin, DESC, 1994
de Villiers, Mike	<i>Developments in Primary Geography: Theory and Practice</i>	Sheffield, Geographical Association, 1995
Foley, Marcia, and Janikoun, Jan	<i>The Really Practical Guide to Geography</i>	Cheltenham, Stanley Thornes, second edition, 1996
Hegarty, Therese, et al.	<i>Windows on the World: Shaping and Being Shaped by Culture (4 vols.)</i>	Navan, Columban Fathers and Sisters, 1992

Horgan, Kathleen	<i>Team Planet: An Action Pack on Our World and Ourselves (4 vols.)</i>	Limerick, Primary School Development Education Project, 1993
Irish National Teachers' Organisation	<i>Social and Environmental Studies in Primary Education in Ireland</i>	Dublin, INTO, 1992
Keane, Margaret, and McCartin, Carmel (eds.)	<i>Geography with a European Dimension</i>	Dublin, Royal Irish Academy, 1995
Madden, Patrick	<i>Go Wild at School</i>	Dublin, School Wildlife Garden Association, 1996
Marsden, Bill, and Hughes, Jo (eds.)	<i>Primary School Geography</i>	London, David Fulton, 1994
May, Stuart, et al.	<i>Fieldwork in Action Books 1–4</i> <i>1: Planning Fieldwork</i> <i>2: An Enquiry Approach</i> <i>3: Managing Out-of-Classroom Activities</i> <i>4: Primary Fieldwork Projects</i>	Sheffield, Geographical Association 1993 1996 1994 1996
Mills, David (ed.)	<i>Geographical Work in Primary Schools</i>	Sheffield, Geographical Association, 1988
Milner, Angela	<i>Geography Starts Here: Practical Approaches with Nursery and Reception Children</i>	Sheffield, Geographical Association, 1996
National Council for Curriculum and Assessment	<i>Report of the Review Body on the Primary Curriculum</i>	Dublin, NCCA and Department of Education, 1990
National Curriculum Council	<i>Earth Science for Primary Teachers</i>	York, NCC, 1993
National Curriculum Council	<i>Teaching Geography at Key Stages 1 and 2</i>	York, NCC, 1993
National Curriculum Council	<i>An Introduction to Teaching Geography at Key Stages 1 and 2</i>	York, NCC, 1993
National Curriculum Council	<i>Geography: Non-statutory Guidance</i>	York, NCC, 1991
Neal, Philip, and Palmer, Joy	<i>Environmental Education in the Primary School</i>	Oxford, Blackwell, 1990
Nicholson, Heather Norris	<i>Geography and History in the National Curriculum</i>	Sheffield, Geographical Association, 1991
Nicholson, Heather Norris	<i>Place in Story-time: Geography through Stories at Key Stages 1 and 2</i>	Sheffield, Geographical Association, 1996
Northern Ireland Council for Educational Development	<i>Guidelines for Primary Schools: Geography</i>	Belfast, NICED, 1988
Northern Ireland Curriculum Council	<i>Proposals for Geography in the Northern Ireland Curriculum</i>	Belfast, NICC, 1990

Northern Ireland Curriculum Council	<i>Consultation Report on Geography</i>	Belfast, NICC, 1991
Northern Ireland Curriculum Council	<i>Guidance Materials for Geography</i>	Belfast, NICC, 1991
O'Connell, Catherine	<i>Peatlands and the Primary School Curriculum</i>	Dublin, Irish Peatland Conservation Council, 1994
O'Doherty, Carmel	<i>Primary Science Starts Here</i>	Limerick, Primary School Science Project, 1994
O'Reilly, Michael	<i>With Travellers: A Handbook for Teachers</i>	Dublin, Blackrock Teachers' Centre, 1993
Palmer, Joy	<i>Geography in the Early Years</i>	London, Routledge, 1994
Rawling, Eleanor, and Daugherty, Richard A.	<i>Geography into the Twenty-First Century</i>	Chichester, Wiley, 1996
Roinn Oideachais	<i>Safety in School Science</i>	Dublin, An Roinn Oideachais, [n.d., 1997]
Scoffham, Stephen	<i>Using Maps from Atlases at Key Stage 2</i>	Sheffield, Geographical Association, 1993
Scottish Consultative Council on the Curriculum	<i>Environmental Studies 5–14 Exemplification: Social Subjects: Understanding People and Place</i>	Dundee, SCCC, 1996
Scottish Office Education Department	<i>Curriculum and Assessment in Scotland: National Guidelines: Environmental Studies 5–14</i>	Edinburgh, HMSO, 1991
Sebba, Judy	<i>Geography for All</i>	London, David Fulton, 1995
Sheehy, Ita	<i>So Everybody Fights: A Teaching Programme on Development Education for 9–15 Year Olds</i>	Blackrock, Irish Commission for Justice and Peace, 1988
Trócaire	<i>Ar Scáth a Chéile: Development Education in the Primary Classroom</i>	Limerick, Trócaire and Curriculum Development Unit, Mary Immaculate College, n.d.
Wiegand, Patrick	<i>Children and Primary Geography</i>	London, Cassell, 1993

Glossary

aerial	literally from the air; used to describe the view from above, for example an aerial perspective
aerial photograph	a photograph taken from an elevated position, usually from an aircraft but also from a satellite; may be oblique or vertical
align	see <i>orientate</i>
altitude	distance above average (mean) sea level
anemometer	an instrument for measuring (and recording) wind speed
Antarctic Circle	the parallel of latitude at 66.5°S (see <i>latitude</i>)
Arctic Circle	the parallel of latitude at 66.5°N (see <i>latitude</i>)
aspect	the direction in which something faces; often used to describe sloping land or a building in relation to the sun
atmospheric pressure	the pressure exerted by the weight of the atmosphere on the Earth's surface, decreasing with height above sea level and varying with weather conditions; may be measured with a barometer and expressed as inches, millibars or hectopascals of pressure
barometer	an instrument for measuring atmospheric pressure
Beaufort scale	scale of wind speed ranging from 0 (calm) to 12 (hurricane, over 120 km/h) devised by Sir Francis Beaufort in 1805
built	constructed by humans; for example, built features in the landscape may include items such as buildings, roads, railway lines, fields, walls or power lines; a built environment is composed largely or solely of features constructed by people
cardinal points	the four main points of the compass: north, east, south, west
cirrus	see <i>cloud types</i>

climate	the average weather conditions experienced in a particular region over a lengthy period of time, usually longer than 30 years
clinometer	an instrument for measuring the angle of elevation of a slope
cloud cover	the estimated fraction of the sky covered in cloud, usually expressed in eighths (okta)
cloud types	terms used to classify clouds by form and by height and according to whether they are rain-bearing or not; primary school children may be introduced to the three main forms, viz. cirrus (feathery), stratus (sheet or layer), and cumulus (heaped)
cognitive map	a mental map or stored image of a place
contour	an imaginary line joining all the points of equal height above or below sea level; this line when drawn on a map
core	the central part of the Earth
crust	the outer layer of the Earth
cultural environment	artistic, religious, ethnic, scientific, technological and recreational activities are aspects of cultural environments
culture	beliefs, behaviours and overall way of life shared by a group of people; a network or system of beliefs, ideas, symbols, values, behaviours and social relations together with its tools, buildings, works of art and other forms of artistic expression transmitted from one generation to the next
cumulus	see <i>cloud types</i>
deposition	the laying down of material which has been eroded and transported; for example, material eroded by a river might be deposited in a delta; rock eroded by the sea may be deposited as a beach

developed area/world	economically prosperous area or region
developing area/world	an area or region developing economic prosperity, often regarded as the converse of developed area
dispersed (settlement)	a pattern of settlement in which homes or other buildings are scattered rather than grouped together
ecosystem	a system formed by all organisms and their interactions with each other and with their physical environment; for example, the ecosystem of a hedgerow would include the soil, plants, insects and other animals, their inter-dependences and inter-relationships
electronic sources	sources of information including CD-ROMs, computer disks, on-line sources (such as those available via e-mail and the internet) and all other forms of information and communication technologies (ICT)
environment	the total surroundings or external conditions within which people, animals and plants live
Equator	the great circle of the Earth with a latitude of 0°, lying equidistant from the poles
erosion	the wearing away of rock or other surfaces, caused by the action of running water, ice, wind or wave action or by chemical processes; erosion involves both the breaking off of material and its removal
ethnic group	a group within a larger population distinguished by traits such as common geographical origins, language, culture or religious traditions
graphicacy	one of the four methods by which people communicate information (literacy, numeracy, oracy, graphicacy); the ability to record, communicate and interpret spatial and other information through the use of methods which do not rely primarily on verbal or numerical means; graphicacy involves the use of maps, plans, diagrams, photographs, models, globes, electronic displays and other methods

graphical	relating to graphicacy
grid	a system of parallel lines intersecting at right angles and producing a series of squares on a map so as to facilitate the description of each point within the squares by the use of co-ordinates or grid references; on simple maps an alphanumeric grid system having the horizontal axis numbered 1, 2, 3, etc. and the vertical axis marked A, B, C, etc. will produce grid references such as 4A and 2C
iconic	in pictorial form; used to describe elements of a child's map, perhaps houses or trees, which are drawn in pictorial form, in contrast to elements such as paths or roads which appear in true plan form
igneous rock	rock which has been formed by the solidification of molten rock material or magma; for example, granite and basalt are igneous rocks
key	an explanation of the symbols, shading and colours used on a map
landform	the shape, form and nature of a feature on the surface of the Earth, for example a hill, mountain or beach
landscape	the total surface form of any rural or urban area, including both natural and human features
large-scale map	a map showing a small area on which features appear in great detail; the larger the scale the greater the detail which may be shown but the smaller the area of land depicted
latitude	distance north or south of the Equator measured as an angle with the centre of the Earth in degrees, the Equator being 0°, the North Pole 90°N and the South Pole 90°S; lines of latitude are parallel to the Equator and are therefore called parallels of latitude; see <i>Equator</i> , <i>Tropic of Cancer</i> , <i>Tropic of Capricorn</i> , <i>Arctic Circle</i> , <i>Antarctic Circle</i>

lava	molten rock or magma that issues from a volcano or fissure on the Earth's surface
location factor	a factor or consideration which encourages people to locate homes, work-places or other features in a particular place; for example, the availability of good transport links might be a location factor for an industry
longitude	the angular distance east or west of the Prime Meridian (i.e. the line of longitude running through Greenwich near London) measured in degrees; all meridians of longitude meet at the north and south poles and intersect parallels of latitude at right angles
magma	semi-molten rock found beneath the crust of the Earth
mantle	the part of the Earth lying between the core and the crust
meridian	a line of longitude
metamorphic rock	rock which has been derived from existing rock which was altered by the application of heat and/or pressure; for example, marble is a metamorphic rock formed when limestone is subjected to heat and pressure
nucleated (settlement)	a cluster of dwellings or other buildings
oblique aerial photograph	a photograph taken from an aircraft or satellite with the camera pointing down at an angle rather than vertically; the photograph produced combines aspects of the ground view with those of the true plan so that buildings and other features are much more readily identified
orientate	to set or align a map so that a north-south line on the map is parallel to the north-south line on the ground; for young children the orientation of maps and plans of small areas will involve linking real places to their representations on the map

parallel	a line of latitude
phenomena	events that can be studied and/or explained scientifically; for example, weather phenomena could include rainfall, a storm, a rise in temperature or the formation of clouds
plates of the crust	the large and rigid elements which make up the crust of the Earth; these plates may move slowly in relation to one another
primary industry	an activity directly concerned with the collection or use of natural resources for example farming, fishing, hunting and mining (see <i>secondary industry</i> and <i>service industry</i>)
primary product	a product of a primary industry
Prime Meridian	the line of longitude which passes through Greenwich near London; other lines of longitude are measured in degrees east or west of this meridian
process	a continuous change made up of a series of actions or events; for example, natural processes include erosion and deposition while processes such as settlement, migration and trading will be encountered in human geography
remote sensing	a means of obtaining information about a feature or phenomenon at a distance from it and without physical contact with it; for example, information might be obtained from sensors on aircraft (as in an aerial photograph) or a satellite (as in satellite images showing land use or temperature)
remotely sensed image	an image obtained using remote sensing
resource (natural)	a feature of the environment (such as minerals, fossil fuels, soils or climate) which may be used to meet human need; renewable resources are naturally replenished (e.g. solar energy, rainfall) while non-renewable resources are finite and so their exploitation will lead to their exhaustion (e.g. fossil fuels and minerals)

secondary industry	the processing of raw materials or foodstuffs; the making of articles or materials by physical labour or mechanical power; (see <i>primary industry</i> and <i>service industry</i>)
sedimentary rock	rock formed from layers of sediment which have resulted from the breakdown of other rocks or organic material and the deposition of the debris in environments such as deep oceans and seas; for example, sandstone and chalk are sedimentary rocks
service industry	distributive trades (for example retailing and wholesaling), financial, commercial and educational institutions, transport and communications, professions and personal services, public administration and defence, construction, repair and maintenance services (see <i>primary industry</i> and <i>secondary industry</i>)
set	see <i>orientate</i>
settlement	any form of human habitation, varying from a single dwelling to the largest cities; the process which gives rise to settlements
signpost map	a plan indicating the direction to various objects or locations from a central point; for example, a signpost map might have a child's desk at its centre from which arrows could radiate to indicate the direction to objects within the room
small-scale map	a map showing a large area on which features are represented in less detail; the smaller the scale the less detail which may be shown but the larger the area of land depicted
social environment	patterns of human behaviour, the social institutions developed by people, and the political and economic systems which they utilise
stratus	see <i>cloud types</i>
streetscape	the impression made on the senses (primarily visual) by the human and natural features of an urban area

sustainable development	the prudent and rational use of natural and human resources so as to maintain, protect and improve the quality of the environment for present and future generations
topography	the description of the surface features of a place
Tropic of Cancer	the parallel of latitude at 23.5°N
Tropic of Capricorn	the parallel of latitude at 23.5°S
Tropics	the area between the Tropic of Cancer and the Tropic of Capricorn
vertical aerial photograph	a photograph taken from an aircraft or satellite with the camera pointing down vertically; objects at the centre of the resulting photograph are shown in true plan form
weathering	the process by which rocks are decomposed or disintegrate by exposure at or near the Earth's surface to water, the atmosphere and organic matter; weathering is concerned with the breakdown of rocks while erosion involves weathering and the transport away of the resulting rock debris
windrose	a graphical representation showing the frequency of winds blowing from the eight chief points of the compass

Membership of the Curriculum Committee for Social, Environmental and Scientific Education

These guidelines has been prepared under the direction of the Curriculum Committee for Social, Environmental and Scientific Education established by the National Council for Curriculum and Assessment.

Chairpersons	Michael Dee	Irish National Teachers' Organisation
	Angela Griffin (<i>from 1995</i>)	Irish National Teachers' Organisation
	Helen Kennedy-Martin (<i>to 1995</i>)	Irish National Teachers' Organisation
Committee members	Br Thomas Costello	Teaching Brothers' Association / Association of Primary Teaching Sisters
	Peadar Cremin	Management of Colleges of Education
	Margie Cullen	National Parents Council – Primary
	Marie Danaswamy (<i>to 1995</i>)	National Parents Council – Primary
	Henry Goff	Irish National Teachers' Organisation
	Teresa Farry (<i>from 1996</i>)	Irish National Teachers' Organisation
	David Fitzgerald	Catholic Primary School Managers' Association
	Angela Griffin	Irish National Teachers' Organisation
	Kathleen Horgan (<i>to 1996</i>)	Irish National Teachers' Organisation
	Jim Hourihane	Irish Federation of University Teachers
	Siobhán Hurley	Irish Federation of University Teachers
	Helen Kennedy-Martin	Irish National Teachers' Organisation
	Frankie McGrath (<i>to 1995</i>)	Irish National Teachers' Organisation
	James Malseed	Church of Ireland General Synod Board of Education
	Sheelagh Morrow	Church of Ireland General Synod Board of Education
	Patrick Murchan	Catholic Primary School Managers' Association
	Éamonn Ó Breacáin	Department of Education and Science
	Tomás Ó Briain	Irish National Teachers' Organisation
	Colm Ó Ceallacháin	Department of Education and Science
Micheál Ó Cinnéide (<i>from 1995</i>)	National Parents Council – Primary	
Micheál Ó Mathúna	Department of Education and Science	
Sr Mairéad Rabbitte	Association of Primary Teaching Sisters / Teaching Brothers' Association	
Brian Tubbert	Irish National Teachers' Organisation	
Education officers	Harold Hislop	
	Carmel O'Doherty	

Membership of the Primary Co-ordinating Committee

To co-ordinate the work of the Curriculum Committees, the Primary Co-ordinating Committee was established by the National Council for Curriculum and Assessment.

Chairperson	Tom Gilmore	
Committee members	Sydney Blain <i>(from 1995)</i>	Church of Ireland General Synod Board of Education
	Liam Ó hÉigeartha <i>(from 1996)</i>	Department of Education and Science
	Dympna Glendenning <i>(to 1995)</i>	Irish National Teachers' Organisation
	Fionnuala Kilfeather <i>(from 1995)</i>	National Parents Council—Primary
	Éamonn MacAonghusa <i>(to 1996)</i>	Department of Education and Science
	Fr. Gerard McNamara <i>(from 1995)</i>	Catholic Primary School Managers' Association
	Peter Mullan	Irish National Teachers' Organisation
	Sheila Nunan <i>(from 1995)</i>	Irish National Teachers' Organisation
	Eugene Wall	Irish Federation of University Teachers
Co-ordinator	Caoimhe Máirtín <i>(to 1995)</i>	
Assistant Chief Executive Primary	Lucy Fallon-Byrne <i>(from 1995)</i>	
Chief Executive	Albert Ó Ceallaigh	

NCCA Chairpersons: Dr Tom Murphy *(to 1996)*, Dr Caroline Hussey *(from 1996)*

Acknowledgements

For permission to use copyright material the publishers make grateful acknowledgement to the following:

<i>Copyright owner</i>	<i>Material</i>	<i>Page</i>
Irish Traveller Movement: Derek Speirs	Photograph of girl drawing caravan	38
Ordnance Survey of Ireland	Government Permit No. 6768	94 99 137
Northern Ireland Council for the Curriculum Examinations and Assessment	Orienteering map reproduced from <i>Guidelines for Primary Schools: Geography</i> , NICED, published by Longman Group UK Limited, 1998.	133
Cassell PLC	Globes, sectioned globe, and world maps reproduced from <i>Children and Primary Geography</i> by Patrick Wiegand, 1993 by permission of Cassell PLC, Wellington House, 125 Strand, London, England	142 152 154
Bibliotheque Nationale de France	Reproduction of drawing by Sebastien Munster from <i>Cosmographie Universelle</i>	143
Quadrillion Publishing Limited	Maps from <i>Geographical Atlas of the World</i> published by Quadrillion Publishing Limited, Godalming, Surrey, England	145
The Geographical Association	World maps reproduced from <i>Placing Places</i> by Simon Catling, 1995 published by the Geographical Association, Sheffield, England.	153

The publishers have, as far as possible, endeavoured to acknowledge sources. The publishers would therefore be glad to hear from any unacknowledged copyright holder.

For access and permission to take photographs the publishers make grateful acknowledgement to the boards of management, principals, teachers and pupils of the primary schools countrywide who co-operated with the project. We would also like to acknowledge the help received from Pavee Point Travellers' Centre.

ISBN 0-7076-6336-9



9 780707 663364



AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA | DEPARTMENT OF EDUCATION AND SCIENCE

