

## NATURAL RESOURCES

## Teachers' Notes

# Natural Resources

## → OUR SHARE OF THE EARTH

### Goals of the module

All modules of this resource emphasise our connectedness to our environment, our responsibility towards it and our dependence on it. This module is specifically about our environment as a resource for everything in our lives, from the basics like air, food and water, to fossil fuels, building materials and clothing. Our dependence is obvious and yet our general behaviour suggests we still don't appreciate the value of these resources. This module looks at food, weather and climate, energy resources and resource depletion. It is not a comprehensive discussion of these issues, but it can be used to start the process of thinking about and discussing them. The module is about encouraging connected thinking, leading to better environmental behaviour.

### Curriculum links

The main curriculum relevance for this module is the Environmental awareness and care strand of SESE, Science and Geography, in particular the strand unit Environmental awareness (become aware of the importance of the Earth's renewable and non-renewable resources;

foster an appreciation of the ways in which people use the Earth's resources, and the need to conserve them). The activities also relate to Weather climate and atmosphere in Geography and Living things and Properties and characteristics of materials in Science.

The module also addresses topics in the Myself strand of Social Personal and Health Education, in particular Taking care of my body (food and nutrition) and Myself and the wider world.

### Overview of the topic

Our interest in natural resources extends to both their quantity (the potential depletion of finite resources) and their quality—for example, pollution of drinking water or the quality of the air we breathe. Some aspects of quality of air and water will be addressed in the Impacts and Pollution module. The focus in this module will be on making the connections between different parts of the environment (soil, water, air, energy and materials) and discussing how we depend on them. The topic of depletion of finite resources—fossil fuels, fresh water or fish—features more significantly.

### Food

Food and water are fundamental requirements for life and a basic human right. Obviously we encounter food and water every day and can see that we depend on the environment to provide us with these necessities. This relates to the quality of the environment around us and its influence on our ability to produce enough food and clean water. Globally we produce enough food, but in developing countries shortage of food is a persistent problem. Lack of clean drinking water is now a major focus of international debate on environment and development.

In Ireland, food shortage itself is not a significant concern, but the environmental impact of our food habits is. Issues include the use of fertilisers and other chemicals, the safe disposal of slurries and manures and the loss of land to development and urbanisation. The way we grow, process, package and transport food has environmental impacts (e.g. water pollution from agrichemicals, climate change associated with energy use and production, excessive packaging and long-distance transportation of food). Our food habits are a major element of our personal environmental impact

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(see the Catulator game on this website).

Another major aspect of our resource use is consumption of fossil fuels for energy. Fuels such as oil, coal and gas are not renewable and will run out before too long. In addition, our consumption of these fuels is the major cause of climate change through what is known as the greenhouse effect. This is driven by emissions of carbon dioxide from the burning of carbon-based fuels, principally oil, gas, coal and peat, and of course the use of electricity that has been generated from these fuels. A unit of electricity means more carbon dioxide emitted than the direct burning of the fuels due to the high losses associated with generation and transmission.

The key message of this module is the interdependent nature of our relationship with our environment. We depend on it for a range of resources and have a responsibility to protect those resources and use them efficiently.

### Our resources – under pressure?

#### Water

Globally, there is more than enough fresh water to meet human needs into the future, but it is not evenly distributed, and many places suffer shortages for all or part of the year. In Ireland, the supply of safe drinking water has been a difficulty in some places because of problems with water treatment. As well as drinking water, Ireland's agricultural

sector depends on rainfall patterns, which are showing some signs of disruption due to climate change—a tangible and very significant human impact on the global environment.

#### Energy

Energy production from fossil fuels causes pollution and climate change. Energy use in Ireland is growing steadily (up by over 50% in the last decade), and the vast majority (95%) of our energy consumption is based on non-renewable fossil fuels. Increasing our use of renewable energy sources such as wind, wood and solar energy is a priority, and some progress is being made. Wind farms are being developed around the country to use this abundant resource, but not without controversy (see the Impacts and Pollution resource pack). Wood and other such materials (biomass) will become more important into the future—power stations may be partly or fully fuelled by trees!

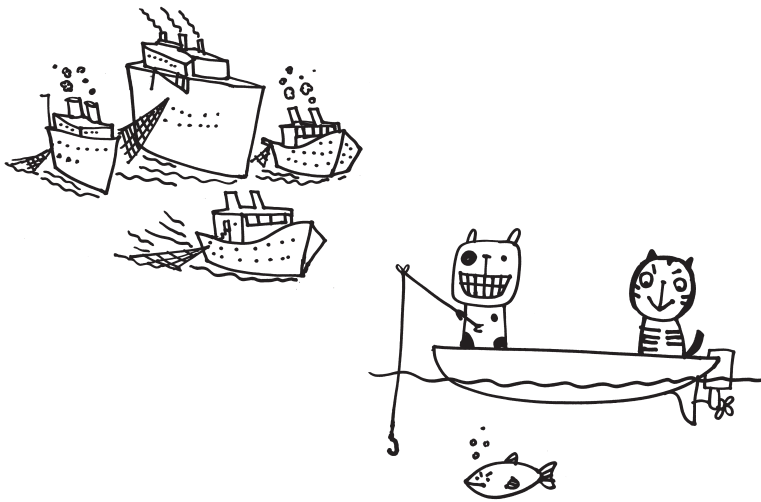
Almost a third of our energy is used for transport (cars mostly), and this also raises concerns about air pollution, particularly in cities (see Ireland's Environment 2004, Chapter 9 and Sustainable Energy Ireland's website [www.sei.ie](http://www.sei.ie) for more information for schools on energy).



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### Fisheries

Overfishing has led to a situation where there is concern that 25 of the 56 commercially targeted marine fish stocks in Ireland are overexploited or in decline. This is caused by taking too many fish and using unsustainable methods, such as catching fish on their way to breeding grounds. Other factors such as pollution of habitats, drainage and acidification of water can affect the availability of fish. The waters around Ireland are very important spawning grounds for mackerel, whiting, hake and haddock. The European Commission has begun to restrict catches of some deepwater species. See Ireland's Environment 2004, Table 17.1 (p. 275) for details on the state of stocks of each main fish species in Irish waters.

### Forests and woodland

Forest and woods cover about 9.5% of the total land area, in comparison to the 31% average for EU member states. About three-quarters of the trees are non-native coniferous trees planted for commercial purposes. Some of this planting destroyed native woodland and doesn't support as diverse a range of wildlife as native woodland. Non-native trees can acidify water courses and soil and be insensitively sited, causing an adverse affect on the landscape.

### Agriculture

Agriculture is in a period of change at the moment. The EU is encouraging farmers to reduce their impact on the environment by using less-intensive farming methods, preserving areas of high natural diversity, setting land aside for

periods, planting trees and encouraging organic production. Under REPS (Rural Environment Protection Scheme) over 30,000 Irish farmers have agreed to implement more environmental farming practices. However, the environmental impacts of farming remain a concern, particularly impacts on water quality.

### What can students do?

By developing an awareness of how we depend on natural resources and how we can use them more efficiently, students will be able to identify simple actions that allow us to optimise resource use. This also ties in with reducing waste. There are many simple things we can all do to help protect our natural resources. Everyday examples include choosing locally grown organic produce in season, cutting down on car use, especially for short journeys, turning off lights when not in use and avoiding excessively packaged goods. Over time, we need to change the way we do things to reduce consumption of non-renewable energy resources.

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### Where to go for information

#### Irish facts and figures, policy and targets

Ireland's Environment 2004 (available on [www.epa.ie](http://www.epa.ie)) is a key source of facts figures and discussion on all topics in these educational resources. Chapter 17 is particularly useful for this topic, but others are also relevant (e.g. Chapter 9 on transport, Chapter 10 on fisheries).

- ECO [www.ecounesco.ie](http://www.ecounesco.ie) has many resources for schools
- Sustainable Energy Ireland [www.sei.ie](http://www.sei.ie) (for energy-related materials see education section)
- The Tree Council of Ireland [www.treecouncil.ie](http://www.treecouncil.ie) (especially their Tree Day manual for schools)
- The Irish Peatland Conservation Council [www.ipcc.ie](http://www.ipcc.ie) has a range of educational materials on the special Irish resource of bog-lands and peat
- ENFO [www.enfo.ie](http://www.enfo.ie) (also St Andrew's St, Dublin 2) has a huge amount of material on all environmental topics for all age groups



### The natural resources pack—content overview

#### 1. Where do you stand? Investigating our share of the Earth

This activity encourages students to think about the finite nature of resources and the pressures on these resources across the globe and is a good introduction to the natural resources theme.

Students play a game in the yard that demonstrates that while we may think of the Earth as very large, its resources are already stretched when it comes to supporting all the people in it. This is good introduction to the natural resources theme.

**Theme** Outdoor Class activity (CA) or indoor Demonstration (D)

#### Curricular Strands

**SESE** Science and Geography—Environmental awareness and care  
**SESE** Geography—Natural environments; Rocks and soils; Soils  
**SPHE** – Myself and the wider world; Environmental care

**Skills** Questioning, observing, predicting, interpreting

**Time** 30 minutes

#### 2. Grow your own! What foods can be grown in Ireland?

This activity encourages thought about where food comes from and its environmental impact, particularly for food travelling long distances. Students consider what foods we can and cannot grow in Ireland. The activity also includes information on the basic skills of gardening and growing food.

**Theme** Class activity (CA)

#### Curricular Strands

**SESE** Science—Living things; Plant and animal life  
**SESE** Science and Geography—Environmental awareness and care  
**SPHE** – Myself; Taking care of my body; Food and nutrition

**Skills** Questioning, observing, predicting, sorting, identifying

**Time** 20 minutes for introductory activity; 40 minutes to prepare for potato growing, followed by regular watering/observation trips over the season

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### 3. Wait your turn! Investigating crop rotation

This exercise explains simple crop rotation and facilitates learning more about growing vegetables and about chemicals in farming.

**Theme** Class activity (CA)

#### Curricular Strands

SESE Science–Living things;  
Plant and animal life

SESE Geography–Natural environments; Rocks and soil; Soil

SESE Science and Geography–Environmental awareness and care

SPHE–Myself and the wider world; Environmental care

**Skills** Questioning, observing, sorting, identifying

**Time** 20 minutes to explain; 20 minutes to complete worksheet

### 4. Food miles–How well travelled is our food?

Investigate where food comes from, how far it travels, the idea of 'food miles', and the potential effect this has on the environment.

**Theme** Class activity (CA)

**Curricular Strands** SESE, Geography–Human environments; Trade and development issues; People at work

SESE Science–Living things; Human life.

SESE Science and Geography–Environmental awareness and care

SPHE–Myself; Taking care of my body; Food and nutrition

**Skills** Questioning, analysing, estimating and measuring, a sense of place, a sense of space

**Time** 20 minute introduction; 30–40 minutes completing the questionnaire and discussing findings (could be split over two days)

### 5. How's the weather? Build your own school weather station

Students build weather instruments to investigate the natural resources of sun, wind and water in their school grounds.

**Theme** Class activity (CA)

#### Curricular Strands

SESE Geography–Natural environments; Weather, climate and atmosphere

SESE Science–Energy and forces; Heat

SESE Science and Geography–Environmental awareness and care

**Skills** Questioning, observing, predicting, designing and making, identifying

**Time** 45–50 minutes to make; 20 minutes to set up

### 6. Euro power! A wind powered money lifter

The class makes a wind turbine to lift a euro coin using the power of the wind. This helps students to move towards an understanding of the availability of renewable resources.

**Theme** Class activity (CA)

#### Curricular Strands

SESE Science and Geography–Environmental awareness and care

SESE Science–Energy and forces; Forces; Science and the environment

**Skills** Questioning, observing, predicting, sorting, identifying, designing and making

**Time** 40 minutes to make; 15 minutes to try out

### 7. Far from the Earth– We depend on the Earth for everything

Students pick everyday objects and trace the path of their materials back to the Earth. This shows how few steps we are from the Earth and encourages thought on our interaction with the Earth.

**Theme** Class activity (CA)

#### Curricular Strands

SESE Science–Materials; Science and environment

SESE Science and Geography–Environmental awareness and care

**Skills** Questioning, observing, recording, communicating

**Time** 40 minutes (or longer if you wish)

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### 8. Straw, sticks or bricks? Surveying local buildings

Students choose a local building, possibly the school itself, and carry out a survey to identify the materials used in construction

**Theme** Class activity (CA)

#### **Curricular Strands**

**SESE** History–Buildings; Sites or ruins in my locality

**SESE** Geography–Human environments; Settlement, homes and other buildings

**SESE** Science and Geography–Environmental awareness and care

**Skills** Observing, questioning, analysing, estimating and measuring, recording and communicating, evaluating, a sense of place, maps and globes

**Time** 20–30 minute introductory discussion; 30–60 minutes conducting the survey depending on site and level of detail of survey. Additional time can be spent on presenting results or follow on activities.

### 9. Fishy business! Overexploitation of natural resources

This is a game where students visualise the idea of overfishing and depletion of resources by pretending to be fish trying to get to their breeding grounds while other students try to catch them.

**Theme** Physical activity (PA) for the sports hall

#### **Curricular Strands**

**SESE** Science and Geography–Environmental awareness and care  
**Physical Education**–Games; Sending, receiving and travelling; Understanding and appreciation of games

**SPHE**–Myself and the wider world; Environmental care

**Skills** Running, dodging, throwing, observing, communicating, hypothesising

**Time** 30 minutes