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DRAFT EXTRACT

Geography Now!

New Junior Cycle

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Foreword

The Educational Company of Ireland is proud to present *Geography Now!* This textbook is designed to meet the needs of the new Junior Cycle Geography course. *Geography Now!* has been written by two highly experienced teachers.

The book offers a well-structured and thorough coverage of the new syllabus specification. Each of the learning outcomes is comprehensively covered.

Geoliteracy, the development of students' ability to develop far-reaching decisions through geographic thinking and reasoning, is actively fostered through the text. The components of geoliteracy – interaction, interconnections and implications – are examined throughout the three strands that make up the Junior Cycle Geography specification.

The sustainable use of resources in our fragile planet is treated through numerous case studies. The life chances of young people in countries at different stages of development are examined.

Great care has been taken to ensure that the language level is appropriate to Junior Cycle Geography students. Age-appropriate literacy and numeracy skills are developed. Bullet points and bold typeface highlight key terms and concepts.

A wide range of visual stimuli including photographs, charts, graphs and maps are an important learning instrument in every chapter. Learning activities, both individual, paired and in larger groups provide students with opportunities for interaction with their peers through discussions and debates.

There is a comprehensive range of Ordnance Survey maps along with aerial photographs and satellite images.

Each chapter begins with learning intentions and definitions and there is wide use of geo facts throughout each chapter. End-of-chapter reflections will help students to assess their learning. Linkages between topics are used to help students to learn in a non-linear way.

Geography Now! is part of a package of textbook, student activity book, e-book, students' graphic organiser, teacher's resource book and online digital resources. The Educational Company of Ireland is very confident that this package provides a full and comprehensive treatment of the syllabus.

Digital Resources

The *Geography Now!* digital resources will enhance classroom learning by encouraging student participation and engagement. They support the New Junior Cycle Specification's emphasis on the use of modern technology in the classroom and are designed to cater for different learning styles.

To provide guidance for the integration of digital resources in the classroom and to aid lesson planning, they are **referenced throughout the textbook** using the following icons:

Student website – **www.edco.ie/geographynow** – with interactive activities and quizzes

A series of stimulating **videos**, covering a variety of different topics, allows students to observe Geography in action

Animations bring key diagrams from the textbook to life and reinforce the topic at hand

PowerPoint presentations provide a summary of key chapters of the student textbook, highlighting main themes and topics.

Teachers can access the *Geography Now!* digital resources – which also include **editable lesson plans** and **solutions** to activities – via the *Geography Now!* interactive e-book, which is available online at **www.edcolearning.ie**.

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Section 1

Soil

13

Go to **www.edco.ie/geographynow** and try the interactive activities and quizzes.

Learning intentions

When you have completed this chapter you will be able to:

- Explain what soil is and list its ingredients
- Describe how soils are formed
- Examine soil profiles
- Assess how leaching affects soil
- Relate soil and vegetation influences
- Assess the exploitation of soil around the world and in Ireland
- Consider the conservation of soil around the world and in Ireland.

Learning Outcomes

1.4 Assess a soil type in a local area in relation to composition and vegetation

2.4 Assess the exploitation of water, fish stocks, forestry and soil as natural resources

Key terms

- mineral matter
- living organisms
- humus
- parent material
- carbon sink
- soil profile
- soil horizon
- bedrock
- plant litter
- topsoil
- subsoil
- soil texture
- leaching
- impermeable
- hardpan
- soil erosion
- monoculture
- desertification
- overgrazing
- overcropping
- soil conservation
- sustainable agricultural practices

DEFINITION

Sand is the largest particle found in soil. When you rub it, it feels rough. Sand is good for drainage, which means it lets water flow through it easily.

Silt is the medium-sized particle found in soil. Silt feels smooth when dry, and feels slippery when wet. Silt is better than sand or clay at holding nutrients.

Clay is the smallest particle found in soil. Clay feels sticky when wet and smooth when dry. It also turns hard as stone when dry.

Texture describes how a soil feels. It is influenced by the size and type of particles that make up the soil.

What is soil?

Soil is the thin layer of loose material on Earth's surface. It is one of the world's most important **natural resources**. Plants obtain their minerals from the soil, so **without soil there would be no food** for animals or people.

Soil has five main ingredients, both living and non-living. They are, with their approximate proportions:

- Mineral matter (45%)
- Air (25%)
- Water (25%)
- Humus (4%)
- Living organisms (1%).

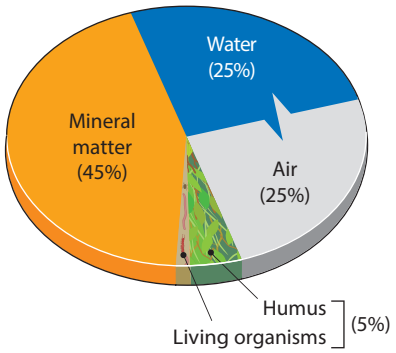


Figure 13.1 The amount of water and air in soil varies, depending on the weather and how well the soil can hold water

Link Science: Chemical World

Mineral matter

Mineral matter is the **biggest ingredient** in soil. It is made up of **rock particles** that have been broken down by weathering and erosion. It includes **sand**, **silt** and **clay**.

Learning Activity

Reflecting Communicating Co-operating

13.1 Work in pairs. One of you explain the term **weathering** to your partner; the other explain the term **erosion** to your partner. Help each other if you need reminding of what these terms mean.

Link Chapters 7 and 8

Air

Air fills the spaces (or **pores**) between the mineral particles in the soil. Air contains **oxygen** and **nitrogen**. These are vital for the growth of plants. Air also allows living organisms to survive in the soil.

Water

Link Science: Biological World

Water helps to bind the soil particles together. Water is important for plant growth because it contains **dissolved minerals**. Plants absorb these minerals through their roots.

Living organisms

Link Science: Biological World

Soil is home to creatures such as earthworms, woodlice and slugs. It is also home to millions of **micro-organisms** – tiny creatures, too small to be seen by the naked eye. They include bacteria and fungi.

When **worms** burrow through the soil, they mix it and also make it easier for water and air to pass through. Micro-organisms help to break down dead plants into humus.

GEO FACT

There are more micro-organisms in one handful of soil than there are people on Earth.

Humus

Organic matter is composed of the remains of dead creatures and plants. It is broken down and mixed into the soil by the living organisms.

As the organic matter decays, it turns into a dark brown or black substance called **humus**.

Humus provides **nutrients** that make the soil fertile. It also helps to bind the soil particles together.

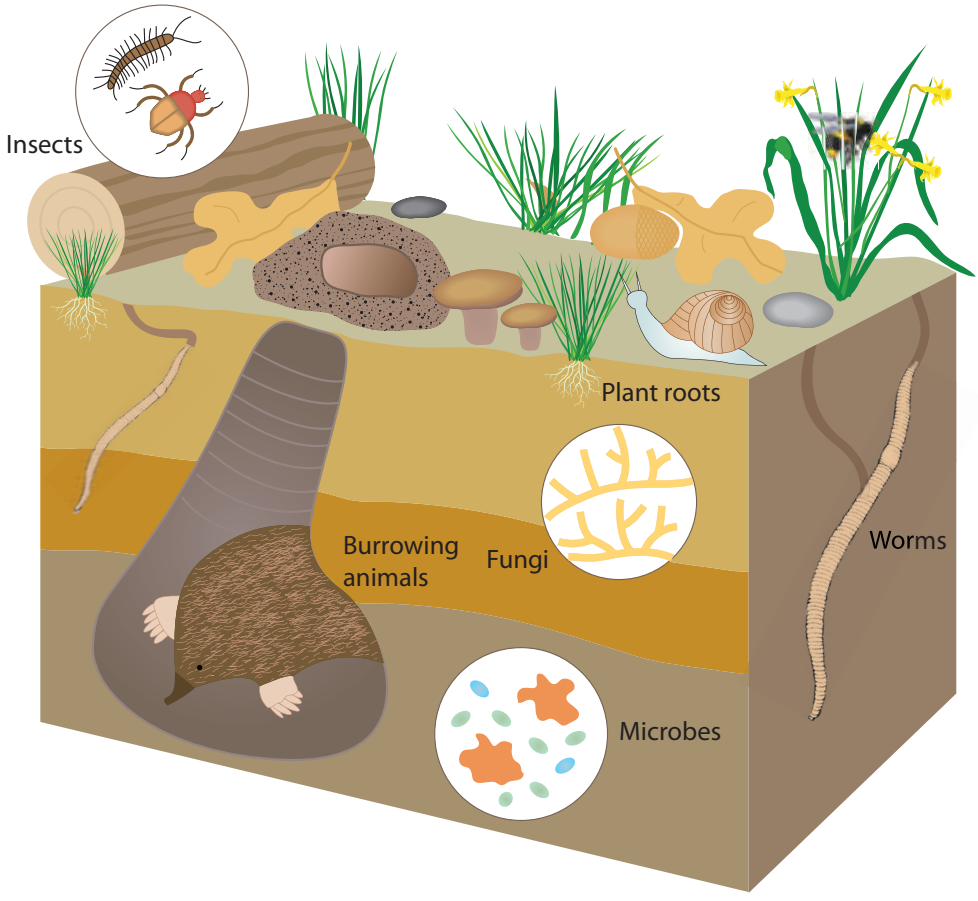


Figure 13.2 Living organisms help to make soil more fertile

How are soils formed?

A number of factors work together over a period of time to form soil. They are:

- Climate
- Parent material
- Vegetation
- Living organisms
- Landscape
- Time.

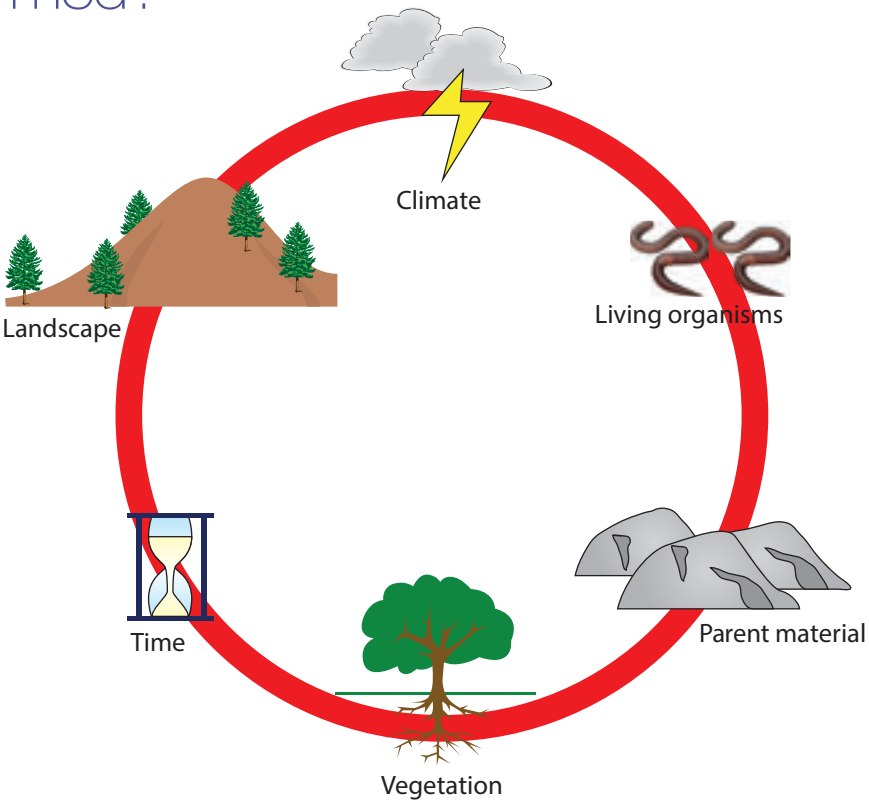


Figure 13.3 The factors that influence how soil is formed

Climate

Temperature and rainfall influence the rate at which the parent rock is broken down by weathering. Hot climates experience **chemical weathering**, while cold climates experience **freeze-thaw**.

Link Chapter 8: pages 73–74

Learning Activity

Reflecting Communicating Co-operating

13.2 Work in pairs. One of you explain the term **freeze-thaw** to your partner, and the other explain the term **chemical weathering** to your partner. Help each other if you need reminding of what these terms mean.

Parent material

The **type of rock** from which the soil is formed is called the **parent material**. This is what determines the type of soil in an area. For example, granite is slow to break down by weathering, while sandstone breaks down easily and forms soil quickly.

Soils that develop from limestone are more fertile than those that develop from granite or sandstone.

Vegetation

When vegetation dies, it is broken down and decays to add **humus** and **nutrients** to the soil. Deciduous vegetation provides more leaf fall than coniferous vegetation.

Learning Activity

Reflecting Communicating Co-operating

13.3 Work in pairs. One of you explain the term **deciduous** to your partner, and the other explain the term **coniferous** to your partner. Use a dictionary to look up these terms if you are not sure what they mean.

Link Chapter 24: pages 000–000

Living organisms

Micro-organisms such as **bacteria** and **fungi** help to break down the dead plant and animal life in the soil, turning it into humus.

As animals such as **earthworms** dig through the soil, they break it up and mix it, allowing more water and air to enter the soil. When these creatures die, their remains add nutrients to the soil.

Learning Activity — Communicating

13.4 Consider how important earthworms are to humans. Where would you put them on a scale of 0 (not at all important) to 10 (vital)? Compare your rating with that of your partner and justify to them your reasons for your assessment. Give your score to the rest of the class to see if everyone is in agreement.

Landscape

Upland areas are cold and wet, so soils are often waterlogged. There is little plant and animal life, so there is less humus.

Lowland soils are generally deeper and well drained. They have more humus as there is plentiful plant and animal life.

Time

Time is one of the most important factors in soil formation. The longer a rock is exposed to the forces of **weathering**, the more it is broken down. It may take up to 400 years for 1 cm of soil to form.

Soil as a natural resource

Soil is an important natural resource. Healthy soil performs numerous functions.

- The most important function of soil is the **production of food** for both human and animal use. Soil stores nutrients and gradually releases them to plants and crops.
- **Clean water** is largely the result of water being filtered as it percolates through the soil and rock. In storing water, soil also assists in the control of flooding.
- Soil provides **raw materials** for industry, including:
  - Kaolin for the pottery industry
  - Sand for the construction industry
  - Soil bacteria for antibiotics.
- Soil is a **carbon sink**. Along with plants and the oceans, it absorbs and stores carbon dioxide from the atmosphere.

Soil is a **non-renewable resource**. It is formed at a rate very much slower than the rate at which it is being damaged. Today, one-third of the soil on Earth is either moderately or highly damaged. This is due to factors that include:

- The increased demand for food
- Poor farming practices.

The result is soil erosion, desertification, soil pollution and loss of soil fertility.

Learning Activity

Literacy Curiosity

13.5 Read the extract below. Then answer the questions following.

Third of Earth's soil is acutely degraded due to agriculture
By Jonathan Watts

A third of the planet's land is severely degraded and fertile soil is being lost at the rate of 24 billion tonnes a year, according to a new United Nations-backed study that calls for a shift away from the destructive aspects of agriculture today.

The alarming decline, which is forecast to continue as demand for food and productive land increases, will add to the risks of conflicts.

The Global Land Outlook is billed as the most comprehensive study of its type, mapping the interlinked impacts of urbanisation, climate change, erosion and forest loss. But the biggest factor is the expansion of industrial farming.

Heavy tilling, multiple harvests and abundant use of agrochemicals have increased yields at the expense of long-term sustainability. In the past 20 years, agricultural production has increased threefold and the amount of irrigated land has doubled.

'Industrial agriculture is good at feeding populations but it is not sustainable. It's like an extractive industry,' says the UN.

The worst affected area is sub-Saharan Africa, but poor land management in Europe also accounts for an estimated 970m tonnes of soil loss from erosion each year with impacts not just on food production but biodiversity, carbon loss and disaster resilience. High levels of food consumption in wealthy countries such as the UK are also a major driver of soil degradation overseas.

Source: Adapted from the *Guardian*, 12 September 2017

DEFINITION

Heavy tilling involves the large-scale use of machinery in the farming of crops.

(a) Answer these questions with a partner.

(i) Suggest why the risk of conflict (wars) becomes greater when land suitable for farming becomes more scarce, as predicted in the second paragraph.

(ii) Identify from the article five activities that together cause soil degradation and loss.

(iii) Paragraph three states that the biggest impact on soil loss is industrial farming. Identify the three things stated in the article that are part of industrial farming.

(iv) Explain how industrial farming is like an extractive industry.

Link Chapter 22: pages 218–225

(v) Explain how high food consumption in countries such as the UK and Ireland impact on the soils overseas.

(b) Share your thoughts on the questions above with the rest of your class.

Learning Activity

Communicating Co-operating Curiosity Responsibility

13.6 'Safeguarding the soil with laws is the primary way of protecting people, plants, and animals. Without healthy, alive soil, there is no future. Healthy, alive soil protects us from environmental disasters, from climate change, from poisons all around.' So says People4Soil, a European citizens' initiative.

Walking debate: People4Soil set up an online petition to persuade the European parliament to make laws to protect soil. If you were eighteen and therefore old enough to sign this petition, would you do so?

(a) Consider your reasons for deciding whether or not to join in asking for laws to be made to protect soil. When your teacher says to, move to the sign that reflects how you feel: Sign, Not sure, Not sign.

(b) Each person should give a justification to the class for why they have chosen their position. If their reason makes you change your mind about your first thoughts, move to join the other group.

Does the majority of your class think there should be laws, or should not be laws, or are they undecided?

Soil profiles

If you dig down into the ground as far as the **bedrock**, you will find a number of different layers. Each layer is called a **horizon**. The layers can be seen along road cuttings and other areas where the soil is exposed.

Apart from the surface layer of **plant litter**, there are usually three horizons in a soil profile. They differ from one another in colour, content and texture.

DEFINITION

Bedrock

The hard layer of rock that lies beneath looser rocks and soil.

Plant litter

Dead plant material, such as leaves and twigs, that has fallen to the ground.

GEO FACT

Soil texture refers to the feel of a soil: the size and type of particles that make it up.

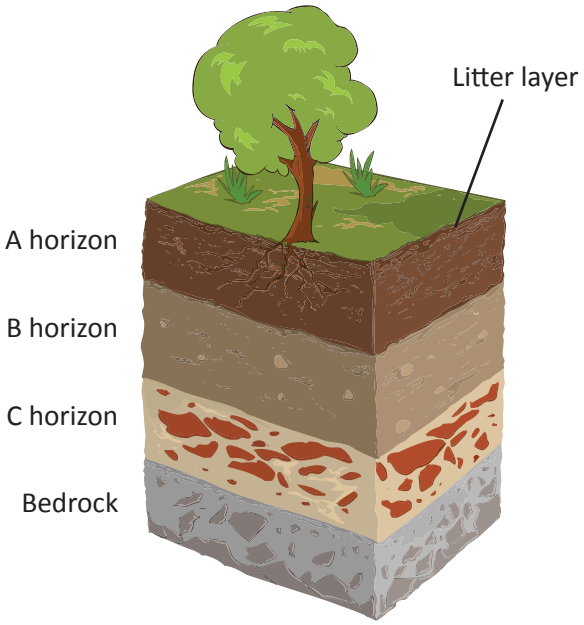


Figure 13.4 A typical soil profile. Compare with the photograph at figure 13.5

A horizon

The upper layer of soil is called the **topsoil**. It is usually darker than lower layers as it has a high humus content. It is **loose and crumbly**. Most of the organisms live in this layer. It is generally the most **fertile** layer of soil.

B horizon

Found beneath the A horizon, this is called the **subsoil**. It is usually lighter in colour because it has less humus. It has more **stones** than the A horizon because it is closer to the parent material and is protected from weathering.

C horizon

The C horizon consists of partially weathered **parent material**. It is made up of large and small rock particles. It lies directly on top of the solid bedrock.

Figure 13.5 A soil profile

Learning Activity

Curiosity Literacy

13.7 Examine the soil profile in the photo at figure 13.5. Answer the following questions in your copy.

(a) Name the horizons that you can identify.

(b) Describe the plant litter.

Leaching

In wet climates, such as in Ireland, water soaks down through the soil. As it does so, it washes minerals, humus and nutrients down into the B horizon. This process is known as **leaching**.

Leaching can cause the A horizon to lose its fertility because it washes the nutrients down beyond the reach of plant roots.

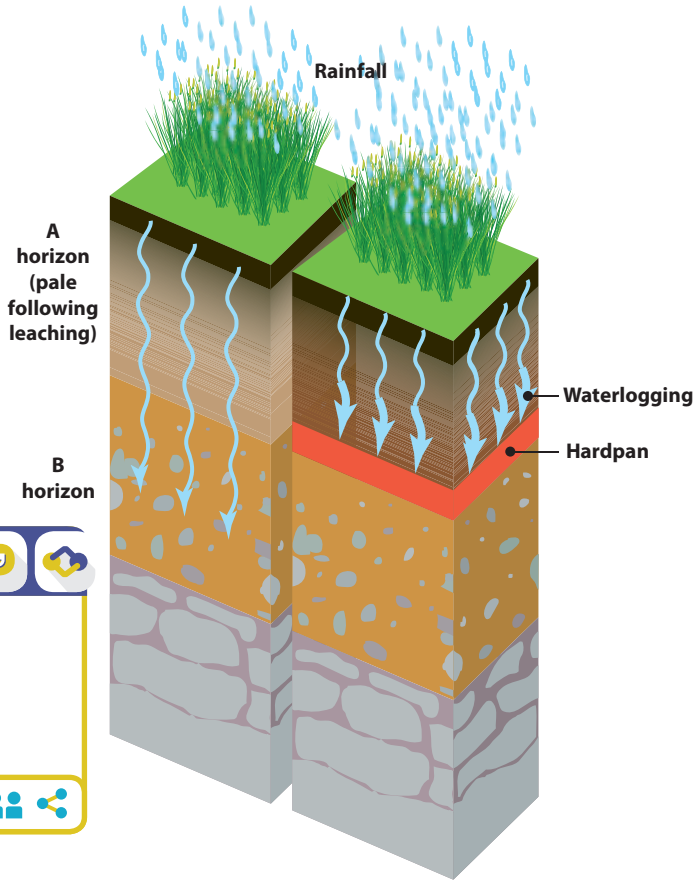


Figure 13.6 Leaching (left) and hardpan (right)

Learning Activity

Curiosity Communicating Co-operating

13.8 Consider what leaching means to farmers. Why would it be a problem? Discuss your thoughts with your partner and then share them with the rest of the class to see what conclusion everyone has come to.

Hardpan

If leaching is very severe, minerals such as clay and iron oxide (rust) build up at the bottom of the A horizon. They cement together to form a crust called **hardpan**.

Since hardpan is **impermeable**, it causes the soil above it to become **waterlogged**.

Impermeable
Rocks that do not let water soak through them are called impermeable.

Figure 13.7 The upper layer of this soil profile has a very pale colour because the nutrients have been leached from it. Note the layer of hardpan, formed by a crust of iron oxide (rust)

Natural vegetation and soil

Soil conditions can influence vegetation; vegetation, in turn, can influence soil conditions.

Table 13.1 How soil influences vegetation

Drainage	**Sandy** soils are free-draining and can support a wide range of vegetation.
	Clay soils become waterlogged and support a limited range of vegetation.
Nutrients	**Fertile** soils contain a wide range of nutrients, including nitrogen and calcium, and can support a wide range of vegetation.
	Infertile soils can support only a limited range of vegetation.
Depth	**Deep** soils support vegetation with long roots such as deciduous forests.
	Shallow soils are limited in the vegetation that they can support (e.g. conifers).

Table 13.2 How vegetation influences soil

Plant litter	**Deciduous** trees provide lots of plant litter to form humus and brown earth soils.
	Coniferous trees provide little plant litter (mostly needles), leading to the formation of relatively infertile soil.
Soil erosion	**Roots** bind soil particles together, thus slowing down or preventing soil erosion.
	Loss of vegetation cover results in soil being eroded by surface water.
Leaching	**Vegetation** can absorb surface water, thus reducing the amount of leaching.
	Without vegetation, the water moves downward in the soil, leaching nutrients.

Learning Activity

Curiosity Communicating

Figure 13.8 Soil and vegetation in a lowland landscape

Figure 13.9 Soil and vegetation in an upland landscape

13.9 Examine figures 13.8 and 13.9 with your partner and identify two ways in which soil conditions and vegetation have influenced one another.

The sustainable exploitation of soil

Healthy soil is essential. It:

- Produces crops used to feed humans and animals
- Grows fibres and trees
- Stores and filters groundwater
- Stores vast quantities of carbon
- Supports innumerable organisms
- Antibiotics can be developed from bacteria found in soil.

Soil is a **non-renewable** resource and is increasingly under pressure.

Learning Activity

Curiosity Communicating

13.10 Earlier in the chapter we discussed how soil is made. Why, then, do we consider it to be a non-renewable resource? Discuss this with your partner and share with the rest of the class.

Soil erosion

Soil erosion is the washing away or blowing away of the upper part of the soil cover.

Undisturbed by humans, soil is usually covered by a canopy of grasses, shrubs and trees. The canopy protects the soil when the rain falls or the wind blows.

GEO FACT

Half of the topsoil on Earth has been lost in the last 150 years.

When the plant cover is disturbed by cultivation, grazing, deforestation, burning, or bulldozing, the soil is exposed to erosion by wind and water. The slow rate of natural erosion is greatly speeded up. Soil is lost at a rate much faster than new soil can be created.

Loss of fertility

Agriculture practices, many on an industrial scale, damage and degrade soil quality.

Pesticides and other **chemicals** used on crop plants have helped farmers to increase yields. However, the **overuse** of some of these chemicals changes the nature of the soil and interferes with the micro-organism population.

Monoculture is the continuous production of one type of crop year after year on the same area of land. **Chemical fertilisers** are used to replace the nutrients absorbed from the soil. Plants are more open to disease, requiring the increased use of **pesticides**.

GEO FACT

Most of the eroded soil ends up in the oceans, rivers or reservoirs, increasing the risk of flooding as well as water pollution from fertilisers and pesticides.

Desertification

Soil can be damaged if it is overused; it can lose its nutrients and become infertile. This means vegetation and crops can't grow. The area can become like a desert. This spread of desert conditions is known as **desertification**.

The areas that are most affected by desertification are those at the edge of existing deserts.

Nowhere is desertification more severe than in the **Sahel**, a region at the southern edge of the Sahara Desert.

Desertification in the Sahel

Desertification in the Sahel results from a combination of **climate change** and **human activities**.

Learning Activity

Curiosity Responsibility

13.11 With the aid of an atlas or other reference, identify the countries marked A to E on figure 13.10 that make up part of the Sahel.

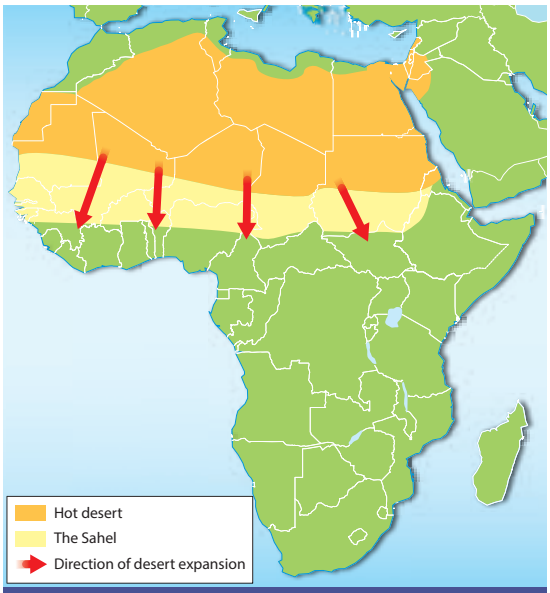


Figure 13.10 The Sahel lies to the south of the Sahara Desert

Climate change The climate of the Sahel has changed over the last thirty years.

- Rainfall in the region has become unreliable. Rains may come late or may not come at all.
- Higher temperatures lead to increased evaporation and less condensation.

As a result, several **droughts** have occurred.

Human factors The countries of the Sahel have a high birth rate, leading to **rapid population growth** and an **increased demand for food**. This placed increased pressure on the land:

- People keep large herds of cattle and goats, leading to **overgrazing** of the land. Overgrazing is caused by grazing too many animals on a piece of land for too long, so it is unable to recover its vegetation.
- **Overcropping** occurs when land is continuously cultivated, as many farmers change from grazing to growing food crops. The soil does not get time to recover the nutrients that have been taken out by other crops. Without fertilisers, the soil soon loses its nutrients and the crops fail.
- People need wood for shelter and cooking. This leads to **deforestation** as people travel from place to place in search of trees and even shrubs. Their roots no longer anchor the soil and soil erosion is speeded up.

Results of desertification

Desertification has had very serious results for the people of the Sahel:

- Vast areas of land are now **unable to support agriculture**.
- Hundreds of thousands of people have **died** because of **famine**, for example in the 1980s.
- Millions of people have been forced to **migrate** in search of food or aid. Many of these people still live in **refugee camps**.
- Many people have moved into urban areas, leading to the growth of **slums**.
- Millions of **animals have died**.

Figure 13.11 The Sahel region

Solutions to desertification

Desertification can be stopped – or even reversed – if there is good management of soil. Most solutions to desertification in the Sahel are carried out at a local level rather than in the region as a whole.

Figure 13.12 Young trees in a nursery in the Sahel prior to being planted as part of a shelter belt

Learning Activity

Curiosity Responsibility Communicating Creativity

13.12 Investigate solutions to desertification. List three ways and combine them with your partner's list. Share your list with another pair of students, and combine your lists.

13.13 In your group of four, research 'The Great Green Wall'. Create a slide presentation, including images. Present this to the rest of the class.

Soil erosion is a world-wide problem

There are very few countries in the world in which soil erosion is not a problem. For example:

- China and India are losing soil at a rate thirty to forty times faster than the natural replacement rate.
- The United States is losing soil ten times faster than it is being replaced.

At these rates, and with current practices and population growth, much of the world's topsoil could be gone **within a few decades**.

Soil degradation has now affected about **one-third** of global land area. The UN estimates that about another one per cent of the global land area is degraded each year.

Learning Activity

Curiosity Communicating Literacy

13.14 EU legislation protects our air and our water as their quality is so important for our health. Currently, there is no EU directive to protect our soil. Do you think there should be laws to protect the exploitation of Ireland's soil? Discuss your thoughts with your partner. Share and continue the discussion with the rest of the class.

Soil conservation

Soil conservation is the prevention of soil loss from erosion or reduced fertility. It is best done by using **sustainable agricultural practices**. Some of these practices are explained in table 13.3.

Sustainable agriculture

How we meet our need for food, fibres and wood in the present without impeding the ability of future generations to meet their needs.

Table 13.3 Sustainable agricultural practices

Practice	What it is	How it works	Where it is used
Crop rotation	Growing, for example, a cereal crop and a root crop in the same field on consecutive years	It increases the **yield** and the **fertility** of the soil because the nutrients used by one of the crops are replaced by the different crop in the next year	Beneficial in all crop farming areas
Contour ploughing	Sloping land is ploughed along the contours rather than up and down the slope	The furrows will be level and can hold rain, preventing run-off and reducing soil erosion	Effective in the large cotton fields and tobacco fields of the southern states of the USA
Terrace farming	**Terracing** is a method of creating flat areas on hillsides. Mud or stone walls are built and the space behind them is filled with soil	When it rains, instead of washing away the soil, the soil stays in place. Nutrients are retained or carried down to the next level	Popular in Asia for planting rice
Windbreaks	Rows of tall trees that are planted close together around the farmland	Evergreen trees are best as they provide year-round protection. Trees and hedges slow down surface run-off and keep nutrients in the soil	Effective when combined with **strip farming**, where different crops, such as cereals and root crops, are grown in long strips in the same field

Figure 13.13 Windbreaks protecting soil from wind erosion and vines from wind damage in New Zealand

Figure 13.14 These rice terraces in the Philippines are part of a World Heritage site

Learning Activity

Communicating Co-operating Responsibility Creativity

13.15 Farmers add fertiliser to their fields to improve the quality of the soil. Gardeners can add compost – a natural fertiliser – to their gardens. In small groups:

(a) Research how to make compost.

(b) Research the benefits of composting – to the soil and to the environment.

(c) Present your findings to the rest of the class in a series of posters. Make sure each member of your group creates or contributes to one of the posters.

Reflecting on my learning

Reflecting Communicating Literacy

Write sentences using each of the following terms from this chapter. You may use more than one of the terms in your sentence if appropriate.

- bedrock
- carbon sink
- desertification
- hardpan
- humus
- impermeable
- leaching
- living organisms
- mineral matter
- monoculture
- overcropping
- overgrazing
- parent material
- plant litter
- soil conservation
- soil erosion
- soil horizon
- soil profile
- soil texture
- subsoil
- sustainable agricultural practices
- topsoil

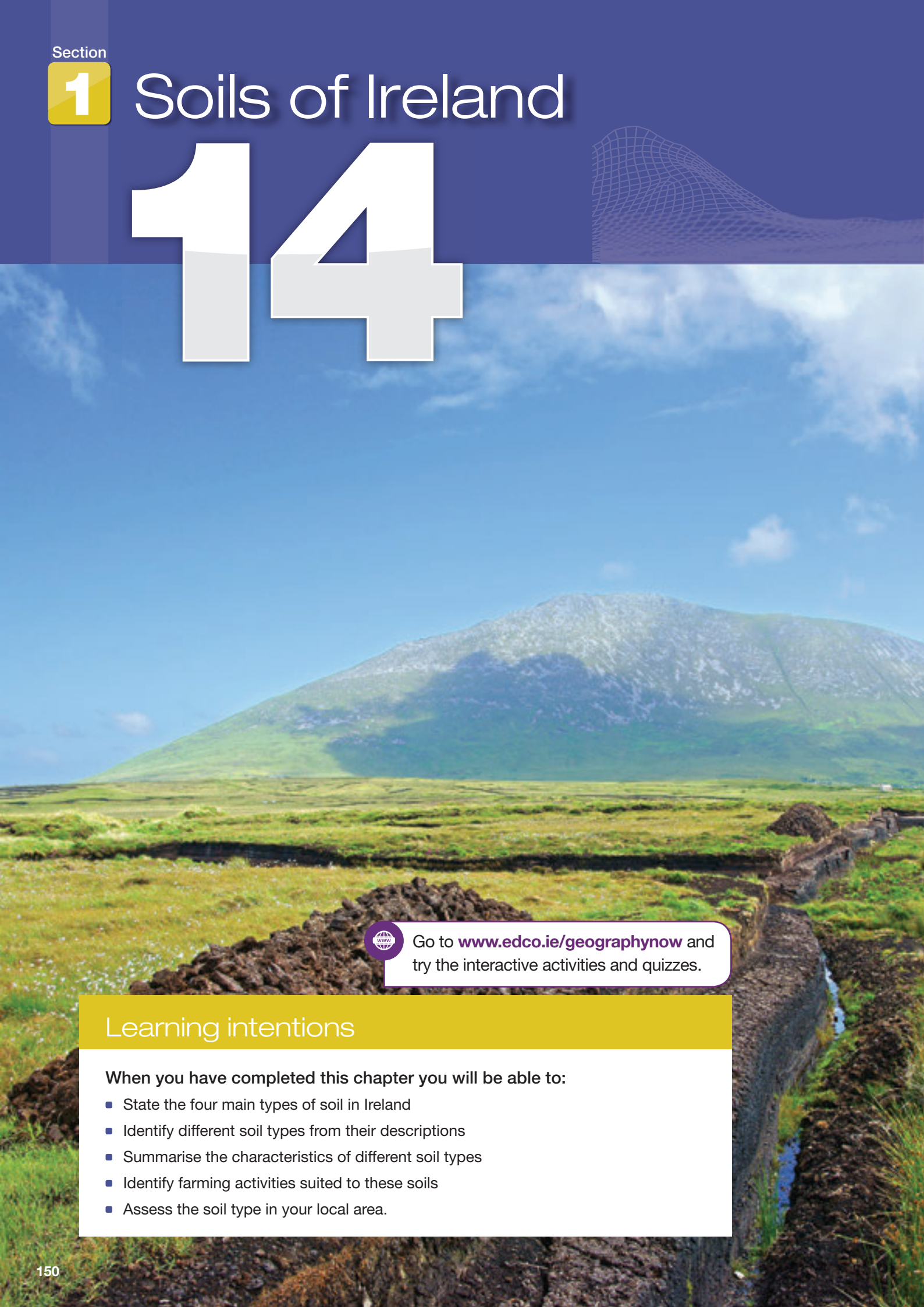
Revision
Go to **www.edco.ie/geographynow** and try the interactive activities and quizzes.

PowerPoint summary

Section 1

Soils of Ireland

14



Go to **www.edco.ie/geographynow** and try the interactive activities and quizzes.

Learning intentions

When you have completed this chapter you will be able to:

- State the four main types of soil in Ireland
- Identify different soil types from their descriptions
- Summarise the characteristics of different soil types
- Identify farming activities suited to these soils
- Assess the soil type in your local area.

Learning Outcomes

1.4 Assess a soil type in a local area in relation to composition and vegetation

2.3 Identify how the physical landscape influences the development of primary activities

Key terms

brown earth soils | peaty soils | podzol soils | gley soils

Soils of Ireland

There are four main soil types in Ireland:

- Brown earth soils
- Peaty soils
- Podzol soils
- Gley soils.

These are summarised in table 14.1.

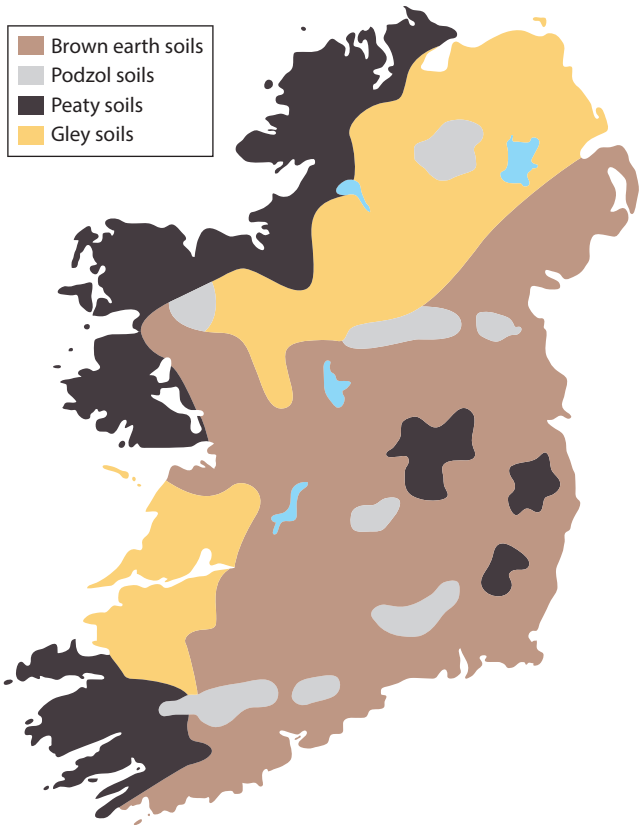


Figure 14.1 This map shows the general locations of the main soil types in Ireland

Learning Activity

Curiosity Responsibility

14.1 Looking at figure 14.1 and using an atlas or other reference source, identify:

(a) Two counties with brown earth soils.

(b) Two counties with podzol soils.

(c) The most common soil type in Ireland.

(d) The main soil type in your county.

(e) One soil type common in lowland areas.

Table 14.1 Main soil types in Ireland

Soil type	Relief, drainage, climate and vegetation	Soil characteristics	Human response
Brown earth soils	■ Found in low-lying areas, where the climate is less extreme ■ Developed on the **boulder clays** deposited after the last ice age ■ Developed in areas that were formerly covered by **deciduous forest**	■ A plentiful supply of plant litter decayed to form **humus**, giving the soil its **dark brown** colour ■ Due to mixing by organisms, the A and B horizons **blend into** one another ■ Brown earth soils are **well drained** ■ There is **very little leaching**	■ The most **fertile** soils in Ireland ■ Suited to a wide range of farming activities, including **arable** and **pastoral** ■ Due to its lowland location, much brown earth land is lost to settlement, transport and industry
Podzol soils	■ Found in both upland and lowland areas, mainly in areas that were covered by **coniferous forest** ■ Developed in a **cold**, **wet** and **poorly drained** environment ■ As a result, plant litter decayed very slowly producing only **small amounts of humus**	■ The soil is **acidic** because of the pine needles ■ Heavy rainfall causes **leaching**, and **hardpan** may develop. This gives the A horizon a greyish colour ■ Podzols are very heavy soils and, as a result, are **badly drained**	■ Lacking in nutrients and **relatively infertile** ■ Limited use for agriculture. ■ Mainly used for rough grazing and forestry ■ Fertility can be improved by the addition of **lime** (crushed limestone) and **fertiliser**
Gley soils	■ Associated with areas where the **drainage is poor** ■ These include areas with **impermeable bedrock** and **clay soils**, such as floodplains ■ Many of these areas are flat, where the water is unable to drain away	■ Since they have a lot of clay, **waterlogging** is common. As a result, there is very **little oxygen** in the pores ■ There is very little bacterial action so **humus builds up** on the surface ■ Leaching and hardpan are problems	■ **Limited agricultural** potential ■ Mainly used for pastoral farming (**sheep grazing**) and **forestry** ■ Fertility can be improved by **deep ploughing** and the addition of **fertiliser**
Peaty soils	■ Found in uplands (**blanket bog**) and lowlands (**raised bog**) ■ Especially common in areas with **high rainfall** ■ Associated with badly drained lowlands	■ Very **dark** in colour and have a spongy texture ■ Apart from water, peat soils contain solid organic matter that decays slowly ■ The **partly decayed solids** include roots, stems, leaves and seeds	■ An **acidic soil** that has few nutrients and is not naturally very fertile ■ When drained, it is great for growing root crops and salads. (Think **compost**!) ■ Harvested as a **non-renewable** source of fuel

DEFINITION

Pastoral farming

Livestock farming (e.g. dairy or sheep), rather than growing crops.

GEO FACT

Peat (or turf) consists of partially decayed organic matter and is used as fuel and garden compost.

Figure 14.2 Brown earth soil covers much of the Irish landscape. It is a fertile soil that suits both arable and pastoral farming

Figure 14.3 The A horizon, or topsoil, has a dark brown colour and is rich in humus. The B horizon is the subsoil

Figure 14.4 Podzol soils were formed in areas associated with coniferous forests. It is a relatively infertile soil

Figure 14.5 Podzol soils are heavily leached. Minerals are washed downwards and the A horizon is left with a greyish tinge

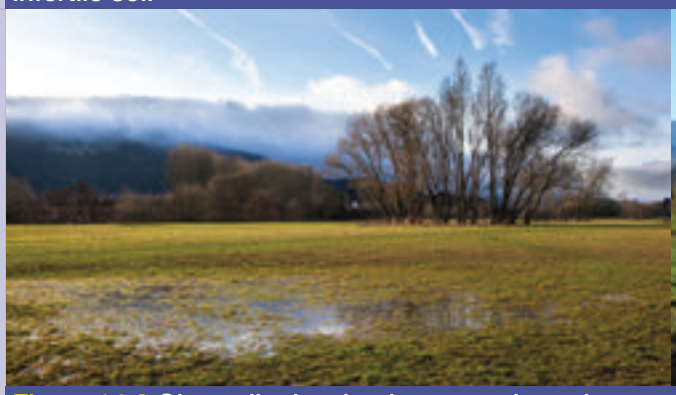


Figure 14.6 Gley soils develop in areas where the drainage is very poor. As a result, they become waterlogged

Figure 14.7 Drainage channels are dug to help drain gley soils and make them suitable for pastoral farming

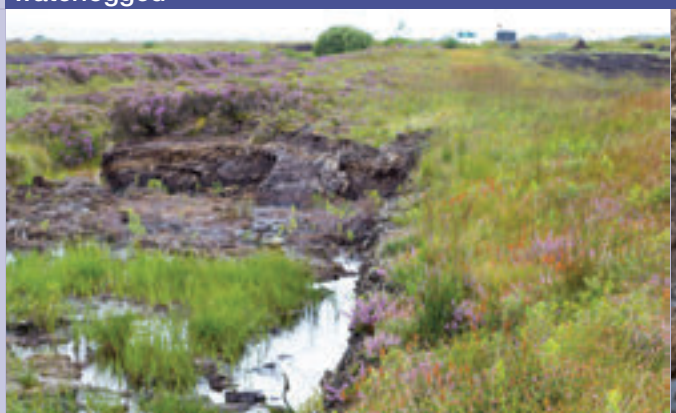


Figure 14.8 Peat soils are spongy and retain water. They are easily waterlogged

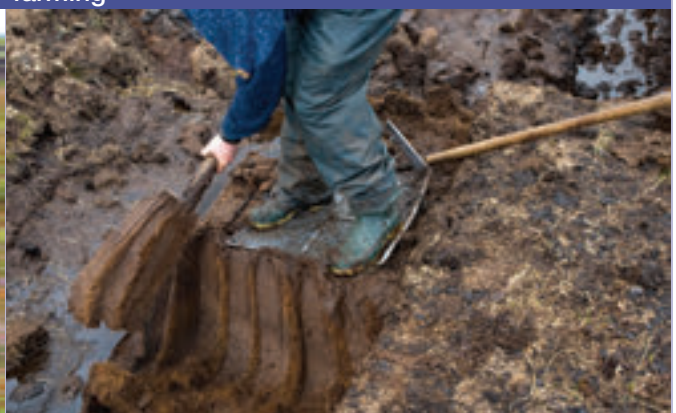


Figure 14.9 Peat consists of a variety of slowly decaying organic matter

Learning Activity

Communicating Co-operating

14.2 Read the extract and, with your partner, answer the questions following.

Loss of peatland is caused by habitat change and exploitation (e.g. through drainage and peat extraction), non-native plants, nutrient pollution and climate change. In addition to their biodiversity value, peatlands are also very important carbon sinks, and act like large sponges to help protect us from flooding. When bogs are drained and harvested, they can no longer perform these functions. Indeed, drained and degraded bogs go from being carbon sinks to very large carbon sources. It has been estimated that the annual emissions from Ireland's degraded peatlands are roughly equal to Ireland's annual transport emissions from cars. The only way to reverse this trend is to block drains and restore our peatlands. This will have benefits in terms of nature conservation, climate change as well as easing and preventing flooding.

Source: Adapted from An Taisce website

DEFINITION

Biodiversity

Short for biological diversity, which is the variety of plant and animal life found in a location.

Questions

(a) Identify from the extract three environmental benefits of peatlands.

(b) Describe how people make a living from peatlands.

(c) State the comparison given for the amount of carbon emissions from bogs that have been harvested and damaged.

GEO FACT

Bord na Móna will cease harvesting and processing peat by 2030. Instead, it will produce energy through sustainable means such as biomass, solar, wind and waste-to-energy.

Learning Activity

Communicating Co-operating Curiosity Responsibility

14.3 **Walking debate:** Do you think Ireland should reduce the amount of harvesting of peatlands?

(a) Think about how peatlands benefit and harm people and wildlife. When your teacher says to, move to the sign that reflects how you feel: Agree, Not sure, Disagree.

(b) Each person should give to the class a justification for why they have chosen their position. If your classmate's reason makes you change your mind about your first thoughts, move to join their group. You can move as often as you like until everyone has decided on their position on this subject.

Learning Activity

Curiosity Co-operating

14.4 Peaty soils are found along the western part of the country (see figure 14.1). Suggest why this is so. (Hint: Examine a physical map of Ireland.) Discuss your thoughts with your partner. Share your conclusions with the rest of the class.

Learning Activity

Responsibility Curiosity

14.5 The maps in this book have given a very broad view of the types of soil in Ireland. Use Teagasc's interactive soil map (do a web search on the term "Teagasc soil map") to find the precise soil type:

(a) Where you live.

(b) Where your school is.

Check with others in your class that you have found the right area and soil type.

Farming

Farming is considered a primary economic activity.

Link **Chapter 22:** pages 218–225

Learning Activity

Reflecting Literacy

Work with a partner for these questions.

14.6 What do we mean by 'primary economic activity'?

(a) Write a definition of primary economic activity in your copy.

(b) Show your partner your definition and ask them whether they consider it an accurate description.

14.7 You and your partner take one question each from (a) and (b) below and tell your partner your thoughts:

(a) Is a farmer with land made up of podzol soil more likely to grow crops or rear cows for meat? Justify your answer.

(b) Is a farmer with land made up of brown earth soil more likely to have a dairy farm or forestry for harvesting? Justify your answer.

Land use capability in Ireland

Soil type is the main influence on land use in Ireland. However, land use is also governed by altitude, slope and drainage. As a result of all of these factors, there are wide variations in the capability of the land from east to west. The most capable soils are found to the east of the country, with the most limited soils found along the west.

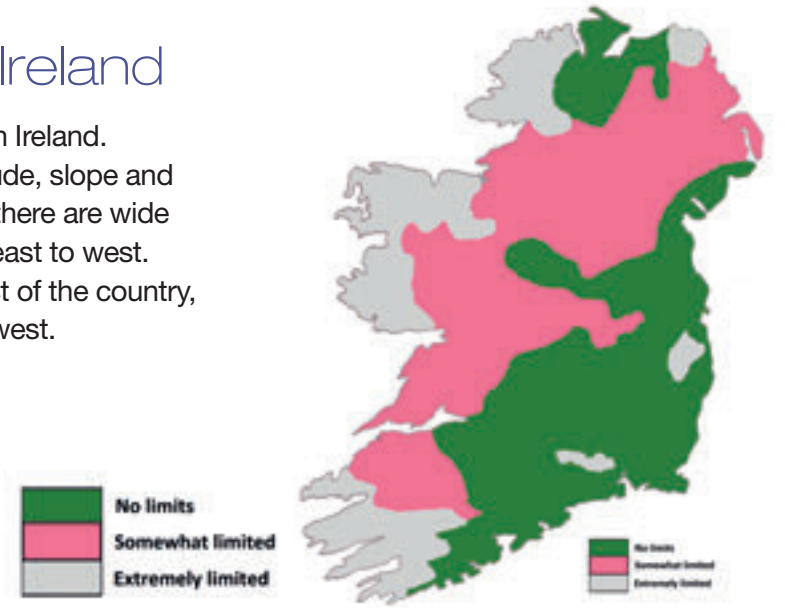


Figure 14.10 General view of the impact of soil type, altitude and drainage on agriculture in Ireland

Section 2

A significant weather event

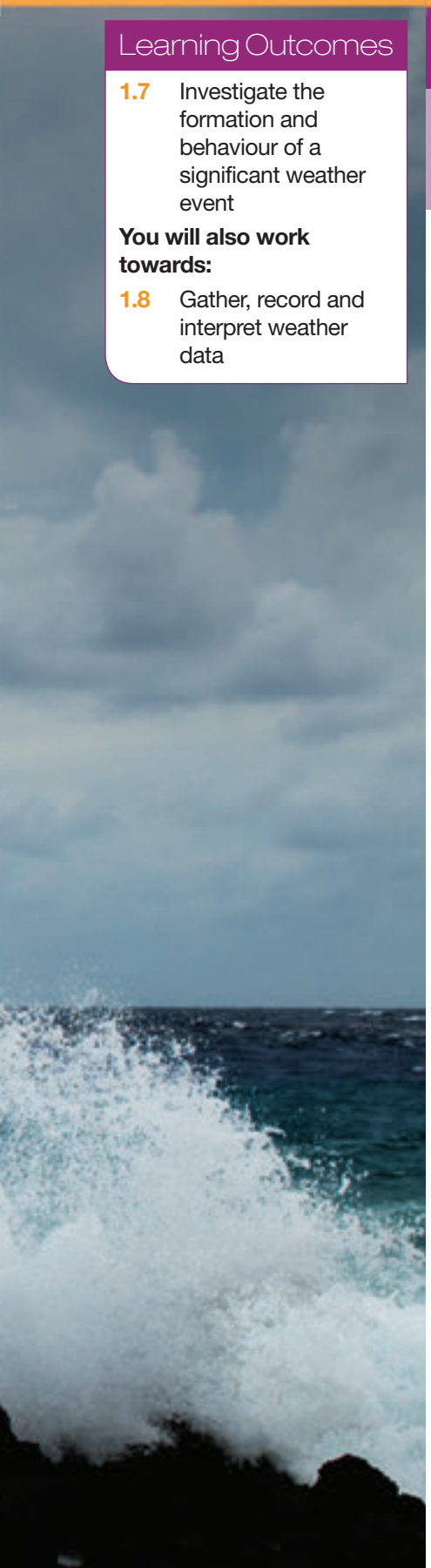
19

Go to **www.edco.ie/geographynow** and try the interactive activities and quizzes.

Learning intentions

When you have completed this chapter you will be able to:

- Explain what a hurricane is
- Describe the formation of a hurricane
- Analyse a recent hurricane
- Assess the impacts of a hurricane.



Learning Outcomes

1.7 Investigate the formation and behaviour of a significant weather event

You will also work towards:

1.8 Gather, record and interpret weather data

Key terms

hurricane | cyclone | tropical storm | typhoon | eye | storm surge

Hurricanes

Hurricanes are the most powerful storms that occur in Earth's atmosphere.

To be classed as a hurricane, the storm must have **continuous wind speeds of over 120 kph**. That is just for a category 1 hurricane! A category 5 hurricane has continuous wind speeds of over 250 km/hr.

GEO FACT

Hurricanes, typhoons and cyclones are all the same type of weather event. Different names are used in different places.

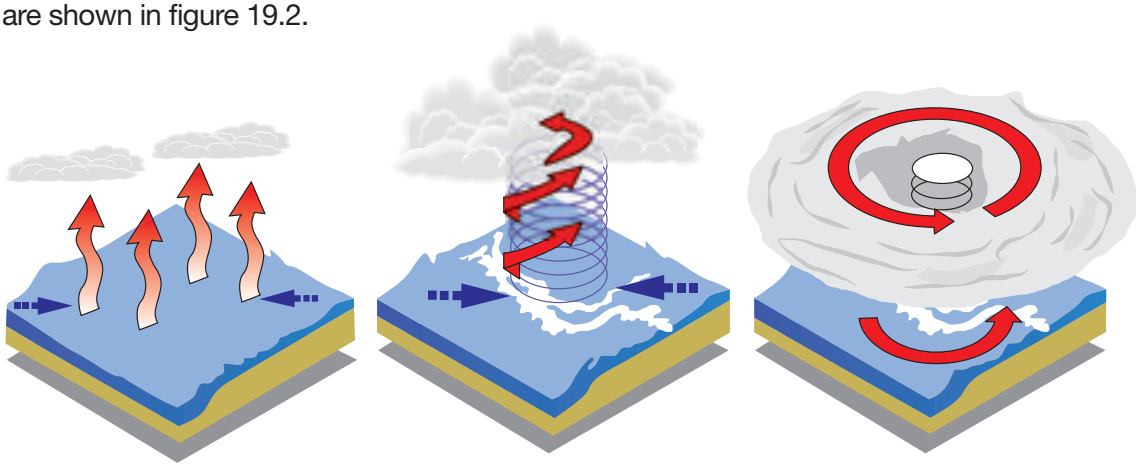
Some facts about hurricanes

- Hurricanes can form only over warm, tropical waters near the equator.
- The winds in a hurricane blow in a large spiral around a centre known as the **eye**. The eye is generally 30 to 50 kilometres wide.
- The winds may extend outward on either side of the eye for 500 kilometres.
- The winds blow in an **anti-clockwise** direction in the northern hemisphere due to the Coriolis effect.
- The hurricane season in the Atlantic lasts from **June to November**, with the peak months being August and September.
- As a hurricane nears land, it can bring **torrential rains**, **high winds** and **storm surges**.

Figure 19.1 Weather map symbol for a hurricane

How hurricanes form

Hurricanes form only over warm ocean waters near the equator. The water temperature must be at least 26°C and the air must be moist (high humidity). The stages of formation are shown in figure 19.2.



- Warm, moist air over the ocean rises upward from near the surface. This creates an area of unusually low air pressure.
- Air from surrounding areas pushes in to take the place of the warm, rising air. It too becomes warmer and rises.
- As the warm, moist air rises, it cools, condenses and forms clouds.
- All this movement of air creates wind.
- A column of low pressure develops at the centre and the winds blow around it.
- As the weather system develops, it begins to **spin** because of the Coriolis effect.
- As the storm spins faster and faster, the **eye** of the storm develops at its centre. This is a calm area of very low pressure.
- The most violent winds occur in the area surrounding the eye.
- Tropical storms usually weaken when they hit land, because they are no longer being fed by the energy from the warm ocean waters.

Figure 19.2 The stages in the development of a tropical storm and hurricane

Figure 19.3 Hurricane Ophelia over Ireland. Note the eye in the centre and how the cloud swirls as the hurricane moves in an anti-clockwise direction

DEFINITION

Storm surge

The rise in seawater level during a storm. The seawater is pushed towards the shore by the force of the winds that swirl around the hurricane.

Hurricane Ophelia

Most hurricanes that form in the Atlantic are pushed westwards towards the Gulf of Mexico and the Caribbean by the trade winds.

However, the hurricane that developed there in early October 2017 took an entirely different track. It headed in a north-easterly direction towards Ireland and Britain.

This was Hurricane Ophelia and it made landfall in Ireland on Monday 16 October as the most powerful storm ever to hit the whole country.

GEO FACT

Hurricanes are given names. The first one of the year has a name starting with A, and the next B, and so on.

The path of Hurricane Ophelia

- Ophelia started out in the mid-Atlantic where, this year, the ocean temperatures were warmer than usual.
- It began as a tropical storm but gathered strength as it travelled. Instead of crossing the Atlantic toward the hurricane-ravaged Caribbean, it went in a north-easterly direction towards Ireland.

GEO FACT

Ophelia was the tenth Atlantic storm in a row to reach hurricane status, a new record.

- Ophelia briefly became a Category 3 hurricane on the Saturday. In doing so, it became the strongest hurricane ever observed so far east in the Atlantic Ocean.
- It gradually weakened to a Category 1 hurricane on Sunday.
- The waters off the southwest coast of Ireland are too cool to support a hurricane so that by the time it hit Ireland on Monday, Ophelia had further weakened to a tropical storm.
- As the centre of the storm lost its wind speed, it grew in area, with the winds spreading out to cover more territory.
- Ophelia tracked track directly over Ireland on Monday, bringing wind gusts of greater than 120 kilometres per hour.
- Met Éireann had issued its highest possible 'status red' warning, covering the whole country ahead of Ophelia's arrival.
- The storm continued across Scotland before dying out over southern Scandinavia on Wednesday.

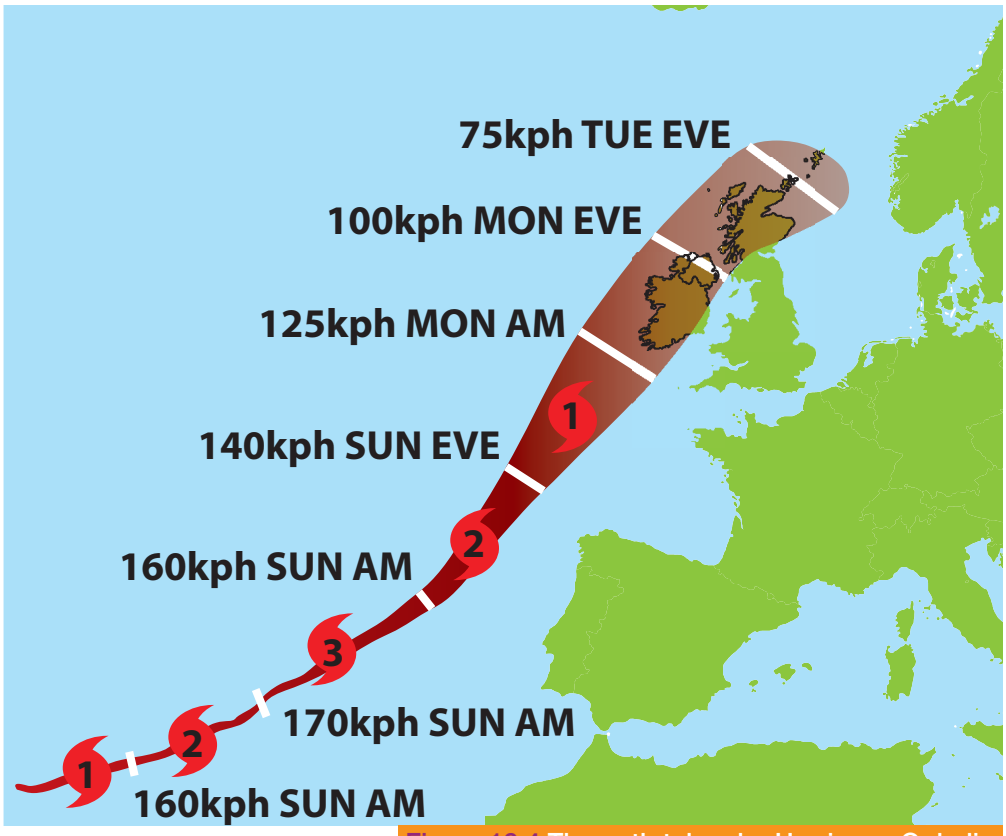


Figure 19.4 The path taken by Hurricane Ophelia and the tropical storm that accompanied it

Figure 19.5 Twenty seven mature trees along the Marina in Cork were felled by Storm Ophelia

The impact of Ophelia was felt throughout the country. There was major damage to property, large-scale flooding, power cuts and widespread disruption to transport, much of the latter as a result of fallen trees.

Learning Activity

Communicating Co-operating Responsibility Creativity

19.1 In small groups, find pictures on the internet that show the impacts of Hurricane Ophelia on the areas it affected. Put these into a slide show and present it to the rest of the class, commenting on each picture.

You will need to decide between you which pictures to use and how to caption them. You should all take a turn at presenting a few of the slides.

19.2 Research the impact of another weather event in your area. Find online or newspaper articles and pictures, and create your own article or blog post using the information and images.

Hurricane Irma

In September 2017, Hurricane Irma became the first hurricane in almost thirty years to achieve category 5 status in the tropical Atlantic region.

It spent nine days as a major hurricane, with four of them as a category 5 hurricane – the longest life span for a storm of this intensity on record.

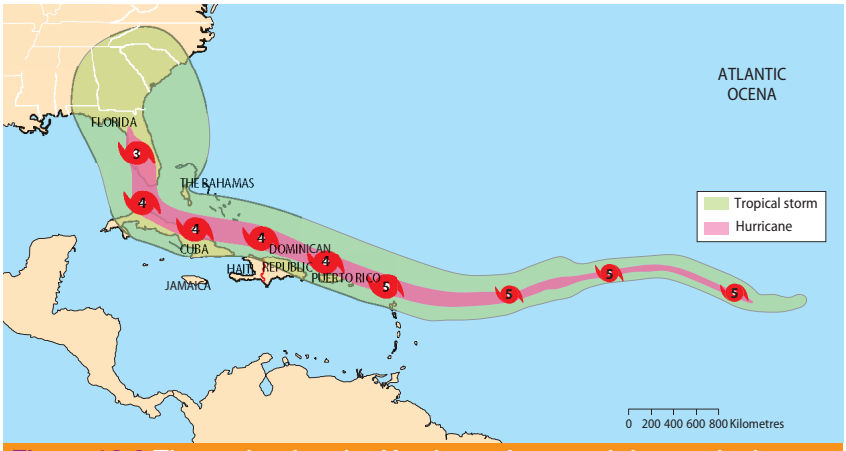


Figure 19.6 The path taken by Hurricane Irma and the tropical storm that accompaied it

Learning Activity

Curiosity Responsibility

19.3 Research Hurricane Irma. Write the answers to the following in your copy.

(a) What wind speed (in kmh) must be reached for a storm to be classified as a hurricane?

(b) What wind speed (in kmh) must be reached for a hurricane to be classified as category 5?

(c) Identify three impacts of the hurricane on the island of Puerto Rico.

(d) Identify three impacts of the hurricane on the state of Florida.

(e) Investigate why the impact of the hurricane on Puerto Rico was more severe than the impact it had on Florida.

(f) Note your source(s) for your answers to questions (a) to (e).

Reflecting on my learning

Reflecting Communicating Literacy

Write sentences using each of the following terms from this chapter. You may use more than one of the terms in your sentence if appropriate.

cyclone | hurricane | tropical storm
eye | storm surge | typhoon

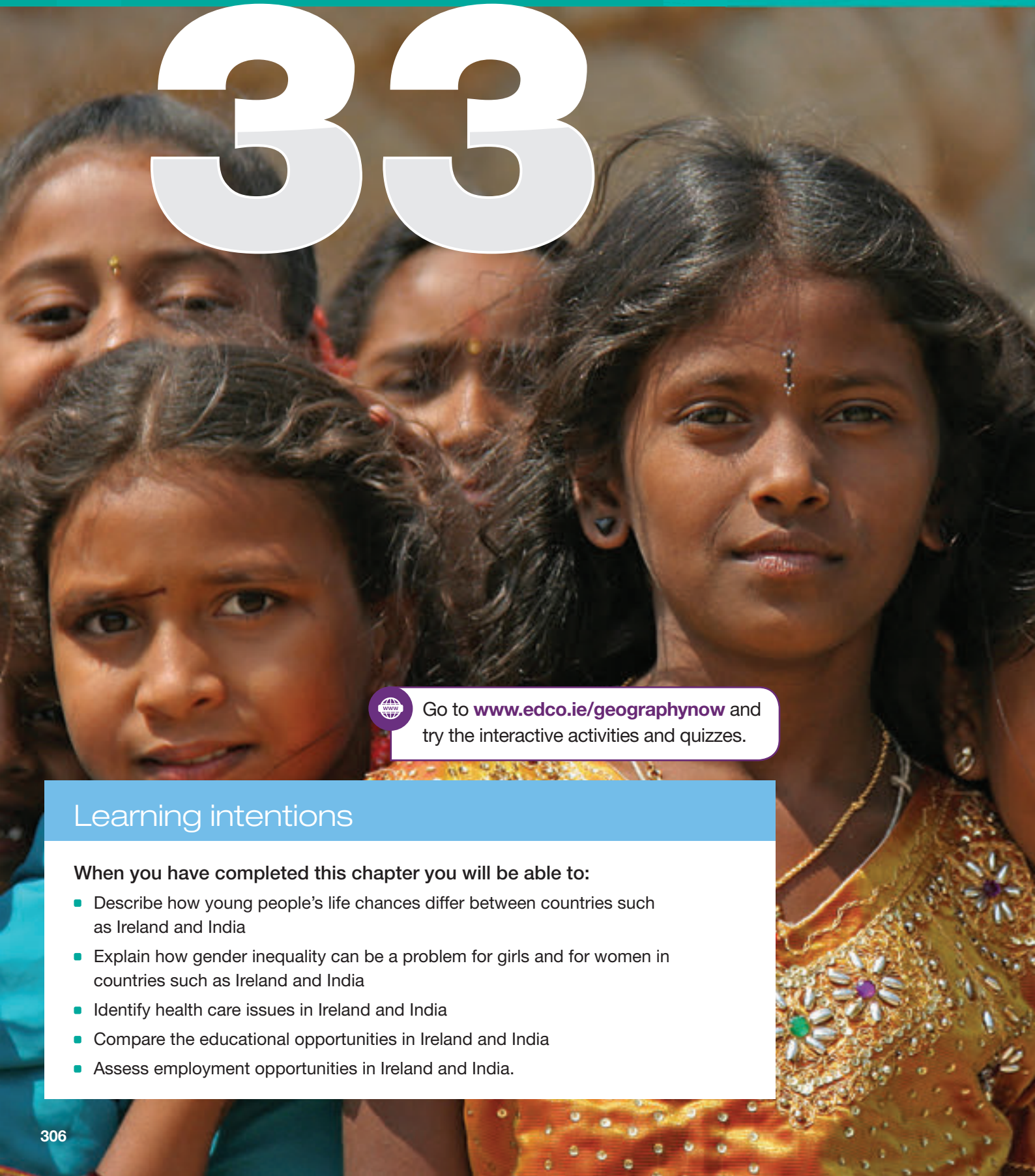
PowerPoint summary

Revision
Go to **www.edco.ie/geographynow** and try the interactive activities and quizzes.

Section 3

Life chances for young people in different parts of the world

33



Go to **www.edco.ie/geographynow** and try the interactive activities and quizzes.

Learning intentions

When you have completed this chapter you will be able to:

- Describe how young people's life chances differ between countries such as Ireland and India
- Explain how gender inequality can be a problem for girls and for women in countries such as Ireland and India
- Identify health care issues in Ireland and India
- Compare the educational opportunities in Ireland and India
- Assess employment opportunities in Ireland and India.

Learning Outcomes

3.7 Compare life chances for a young person in relation to gender equality, health care, employment and education opportunities in a developed and a developing country

Key terms

life chances | education | employment | gender equality | health care

Life chances

Link Chapter 8: pages 266–275

Life chances are the opportunities that young people have in order to improve their quality of life and to develop their full potential.

In previous chapters, we have seen that death rates and life expectancy vary a great deal across the world. Similarly, the life chances of young people differ between those living in developed countries and those living in the least developed countries.

A person's life chances are influenced by:

- The level of **gender equality** that exists in their culture
- Their **educational options**
- The **health care** that is available to them
- **Employment opportunities** in the economy.

In this chapter, we will compare the life chances that exist for young people in **Ireland**, an economically developed country, and the life chances that exist for young people in **India**, an economically developing country.

Learning Activity

Curiosity Reflecting Communicating Literacy

33.1 Consider the opportunities available to young people in Ireland, and what you know or can imagine about the opportunities available to young people in India.

(a) On your own, create a table in your copy with the following headings. Make each row deep enough to fill in about four lines. Then fill in one thing you know or think might be true about opportunities that are or are not available for young people in the two countries.

	Ireland	India
Gender equality		
Educational opportunities		
Health care		
Employment opportunities		

Learning Activity

Curiosity Reflecting Communicating Literacy

(b) Share your completed table with your partner. Add to your table anything they thought of that you didn't.

(c) Join with another pair and share your tables. Add to your table anything they thought of that you didn't.

Gender equality

Gender equality means treating women and men equally.

Ireland

One hundred years ago, women's roles in Ireland were very different from those of today. At that time, Ireland, apart from north-east Ulster, was an **agricultural society**. Within this society:

- Many women's marriages were arranged
- Very few women owned property
- Women were tied to the traditional roles of wife and mother
- Women in general did not plan their families
- Very few women worked outside the home.

Women today have lifestyles that are very different from the lives of their grandmothers.

Figure 33.1 Women in a traditional role in Ireland in the past

GEO FACT

In 1918, women aged 30 years and above were given the vote in Ireland for the first time.

Changes in the role of women

Now, many women work outside the home. There is a combination of reasons for this:

- **Free secondary education** was introduced in 1967. This increased education levels for girls and boys. Today, young women enter third level education in greater numbers than young men.
- **The Women's Liberation movement** of the 1970s – an international movement – led to many changes in the status of women.
- **Gender equality laws** gave women equal pay and equal status for equal work in the job market.
- **Crèches** enable mothers to go to work.
- Many women choose to work outside the home for **personal** and **economic reasons**.
- Mothers today have, on average, two children each, giving them **more freedom** to work outside of the home.
- The great increase in the **cost of homes** means that in many homes two people have to work to pay the mortgage or rent.

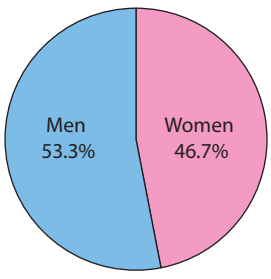


Figure 33.2 Ireland's workforce in 2015

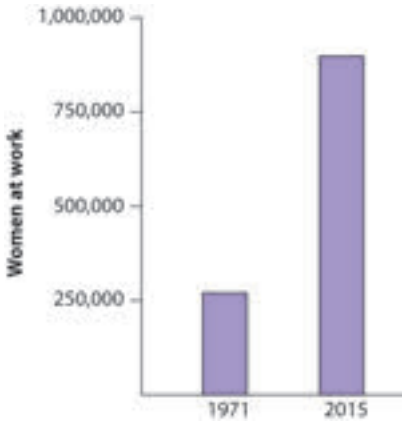


Figure 33.3 The number of women at work in Ireland has increased enormously in recent decades

GEO FACT

As a group, women in Ireland were paid almost 14 per cent less than men in 2014, even though women do better at school and university than men.

Learning Activity

Curiosity

33.2 Read the geo fact on the left. Suggest one reason why women in Ireland are still paid less than men as a group. Discuss this with your partner and share with the rest of the class.

Learning Activity

Curiosity Responsibility

33.3 It is not only women that have equality rights in the workplace. Research the following and make notes in your copy.

(a) State the name of the act of Oireachtas that legislates for equality at work.

(b) Explain how the act defines 'discrimination'.

(c) How many areas does the Act specify for which people are legally covered to be treated equally? State three of them.

(d) State your source(s) for the information you found for questions (a)–(c).

India

Gender equality for girls and women in India is far behind that of Ireland. Girls are not valued as much as boys. Some expectant parents who can afford the operation, will even abort female foetuses.

As they grow up, girls are often prevented from attending school, especially in rural areas, and therefore girls are less literate than boys.

The age of marriage for girls is very young, as you can see from figure 33.4.

GEO FACT

Indira Gandhi was prime minister of India between 1966 and 1977, and again between 1980 and 1984, when she was assassinated. She was the first, and to date the only, woman prime minister of India.

GEO FACT

Literacy rates in India for people over the age of 15: women 63%; men 81%.

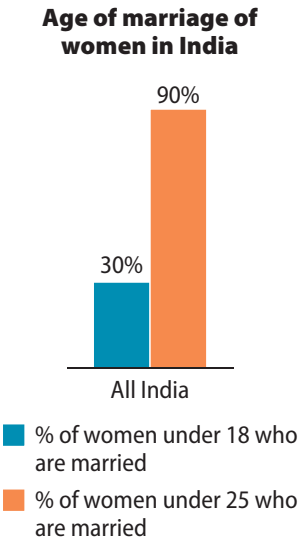


Figure 33.4 Percentage of young women who are married at under 18 and under 25 years in India

Learning Activity

Curiosity Numeracy

33.4 Examine figures 33.4 and 33.5. What can you determine about the relationship between the two sets of data? Discuss your findings with your partner and then share with the rest of the class.

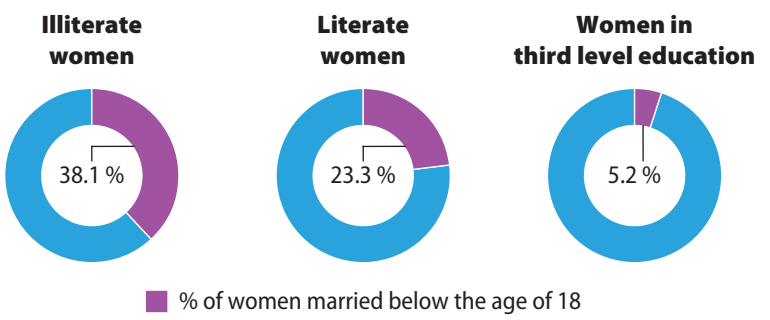


Figure 33.5 Education levels of young Indian women of 18 years of age and under, who are married

Millions of Indian girls are forced to marry at an early age because they are considered **an economic burden** to their families. In addition, the younger a girl is when she marries, the lower the cost of a dowry to her family.

Figure 33.6 Indian women do heavy physical work, such as working in the fields and carrying water

GEO FACT

Dowries were common in Ireland even into the 1960s.

DEFINITION

Dowry

Money given by a bride's family to her husband's family when she marries.

In India, a bride becomes the **property of her husband**. Generally speaking, girls are guided by their fathers, wives are guided by their husbands and old women by their sons.

Women regularly experience **violence and abuse** at the hands of male members of the family. Brides may be murdered if the husband's family considers the dowry she has brought with her to be too small. These crimes are of course illegal but the culprits are often not caught and punished.

Hindu **widows**, no matter how young, may not remarry and must wear white rather than their former brightly coloured clothes. Many are shunned by their community.

However, in educated families, girls go to school and often become college graduates. These women enter the professions and many become very successful. A small number of women have done very well in the banking world and are on an equal footing with their male counterparts. These are the exception rather than the norm.

GEO FACT

A blessing frequently given to a young married couple in India: 'May you be blessed with a hundred sons.'

GEO FACT

In order to provide personal security for women in India, certain sections of trains and buses are female only.

Learning Activity

Curiosity Communicating Co-operating Literacy

33.5 Read the following extract of an article from *Hindustan Times*. Then, in small groups, discuss the questions below.

By HT Brand Studio, 24 July 2017

With male domination being so deeply entrenched both in our mindset and our laws, Indians have long since accepted the current social situation as the default one. Even in the most progressive families, daughters are still entitled to far less than sons, from playtime and education to choosing a life partner and inheriting property. No sooner than they are of age, girls are expected to help out in household duties – largely unpaid and unrecognized tasks that they're meant to fulfil throughout their lives. This unequal distribution of resources and opportunities continues into adulthood with significant wage gaps and indiscriminate sexism in everyday affairs. Similarly, boys who grow up seeing their mothers unquestioningly handle all the housework will automatically grow up expecting their wives and daughters to follow suit.

Learning Activity

Curiosity Communicating Co-operating Literacy

The conversation today, therefore, is no longer just about law and order; it also highlights a woman's right to dignity, respect, and equality across all spheres of public and personal life.

(a) Could the extract apply equally to Ireland as to India? Discuss how the two countries are similar and different in this respect.

(b) One of your group should draw a line with ten marks labelled 1 (not much) to 10 (a great deal). Pass the paper around your group, and from your reading of this section on gender equality, each of you assign a score on how great you consider the difference between the way women are treated in the two countries.

Educational opportunities

Link Chapter 40: pages 358–371

Ireland

In Ireland, **educational opportunities** for children and young people are among the **best in the world**.

Here are some **facts about education in Ireland**:

- Education is **compulsory**.
- Teachers are extremely **well trained** for four years in teacher training colleges.
- Most students remain in school until the **Leaving Certificate**.
- **Girls achieve higher grades** than boys on average.
- A high percentage of students attend **third level** courses in universities and colleges. Students are awarded places based on their Leaving Certificate points. The points system is pressurising but very fair.

Table 33.1 Irish education figures for 2017

Number of students in education (primary to tertiary)	1.09 million
Number of students in third level education	174,000
Government expenditure on education	€8.8 billion
Compulsory school years	6–16
Percentage of second level students who complete the Leaving Certificate	90.5%
Percentage of 30–34 year olds with third level qualifications	51%

- More girls **graduate** from third level colleges and universities than boys.
- Ireland's young people are among the **most educated in the world**. The percentage of 30–34 year olds in Ireland with third level qualifications is among the highest in the EU, but is not as high as in Japan and South Korea.

Attendance in third level education

Young people's participation in third level education depends partly on parents' income and where they come from. For instance:

- In Dublin's wealthiest districts, up to 99% of students go on to college.
- In the most disadvantaged districts of Dublin, fewer than 20% of students go on to college.

GEO FACT

In 1950, only 4,500 students sat the Leaving Certificate. Today, the figure is almost 60,000.

Students can choose from a great variety of third level courses. **STEM** (**S**cience, **T**echnology, **E**ngineering, **M**athematics) courses are in high demand. Graduates in these fields of study have a great variety of jobs available to them. Ireland comes 15th of all countries ranked for their educational attainments in science and maths.

However, at the other end of the scale is the small percentage of second level students, usually from disadvantaged areas, who drop out at various stages of post-primary school. The life chances of those students are seriously reduced. They possess few skills and their job opportunities are more limited. They are more likely to be **unemployed**.

There are also opportunities for young people who don't go on to third level studies to work in trades and services.

Learning Activity

Curiosity Communicating Co-operating

33.6 In small groups, use the brain droplets handout that your teacher will give you to help you think of barriers to fully availing of Ireland's education system. Pass the sheet round so each of you writes one idea in a droplet before passing on to the next person. Keep passing the sheet round the group until nobody has anything to add. You may discuss any point before adding it.

Share your thoughts with the rest of the class.

India

Educational opportunities in India depend largely on the **wealth** of a young person's family. Every city in India has private fee-paying schools. These schools are run by private individuals and by organisations such as religious orders and congregations. For instance:

- The Irish Christian Brothers have 21 schools. Their schools may be very large and can have more than 2,000 students on the rolls.
- The Loreto Sisters have 22 schools for girls.

Many fee-paying schools teach through the medium of English.

GEO FACT

English is increasingly the language of business in Indian cities today.

Here are some **facts about education in India**:

- Classes range from kindergarten to Class 12, after which young people can go on to university or other third level colleges.
- Many Indian students concentrate on **STEM** fields of study because career opportunities await them both at home and abroad.

Figure 33.7 **A village school in rural India**

- Most children go to **state-run schools**.
- In state-run schools, especially in rural areas where the most of the population lives, school **facilities are very poor** with dirt floors, no desks, windows without glass and classrooms without cooling fans.
- Teachers in many parts of India are very **poorly trained**.
- Pupil **absenteeism** is high, especially among girls, in rural areas.

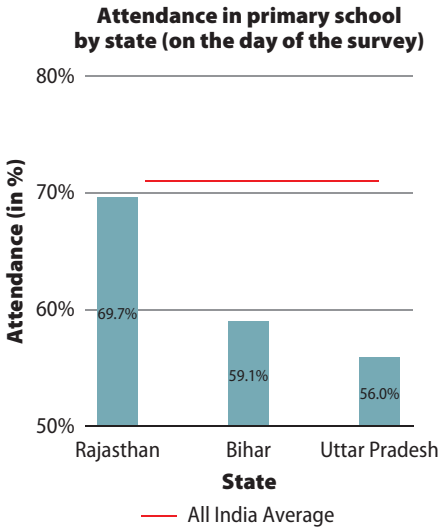


Figure 33.8 **Attendance in primary school by state**

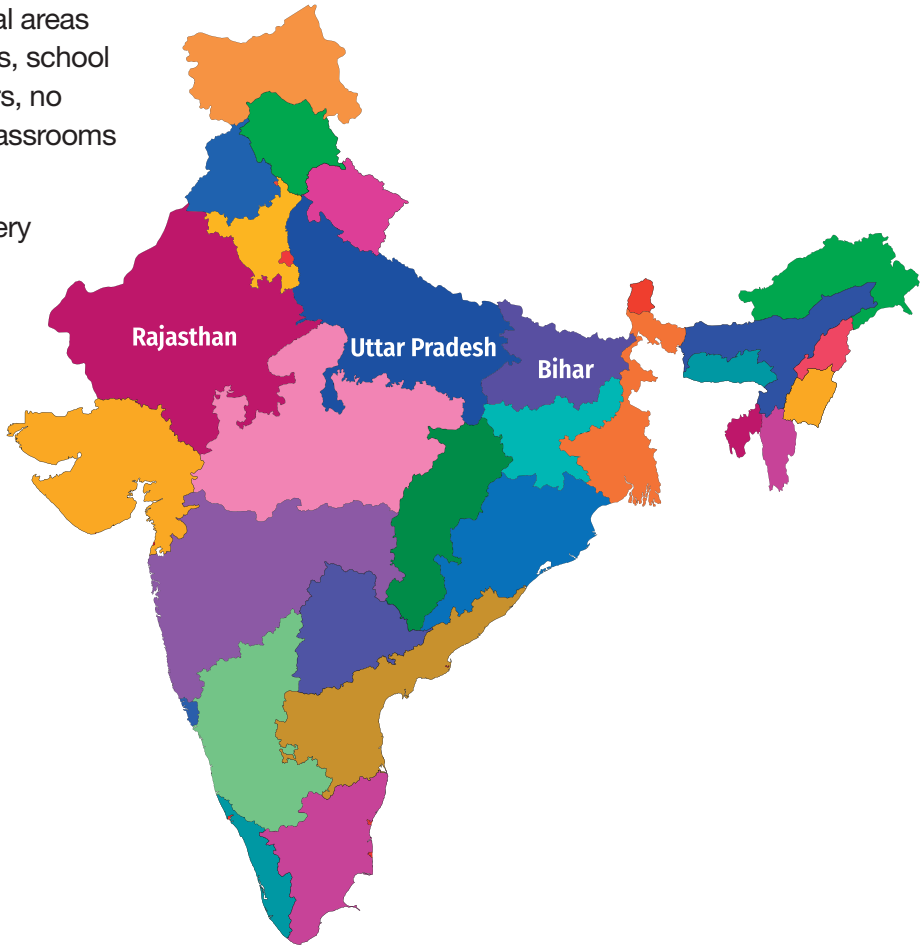


Figure 33.9 **The states of India.**

Learning Activity

Reflecting Responsibility Communicating Literacy

33.7 Examine the photo at figure 33.10. Create a table or write about 250 words comparing this schoolroom with your experiences of school. What is the same and what is different?

Figure 33.10 **A schoolroom in Varenesi, a poorer part of India**

Health care

Ireland

By global standards, the life chances for Irish children in terms of health and **health care** are excellent. Life expectancy in Ireland is one of the highest in the world. Irish people have excellent nutrition due to a generally high standard of living.

Table 33.2 Ireland – health related facts

Life expectancy	82 years
Child mortality	4 per 1,000 under five years of age
Major causes of adult death	Cancer, stroke, heart disease

Infant and child mortality are as low as they are in neighbouring countries in Western Europe. Infectious diseases among adults, such as TB, have been controlled for decades with modern medicines.

The major causes of **adult deaths** in Ireland today are age related. Many **health conditions** are related to **life style**, particularly when it results in obesity. This may lead to high blood pressure, high cholesterol and joint deterioration.

Hospital standards are generally high. Ireland has a **two-tier health system**. For the people who have **health insurance** (who account for just under 50% of the population), quick access to hospitals and consultants is very good and they receive speedy treatment for medical conditions.

However, for the rest of the population – those who do not have insurance or who have **medical cards** – access to hospitals is much slower. In August, 2017, there were 687,000 people on waiting lists, and they may be on a waiting list for up to two years.

GEO FACT

€14 billion was spent on the health budget by the Irish government in 2017.

The only solution to an improved health service is **higher taxes** so that the health budget can be expanded. A bigger budget will allow new wards to be opened and the hiring of additional medical staff.

Table 33.3 Life expectancy in years in Ireland and India – change over time

Life expectancy	1960	2017
Ireland	70	82
India	41	68

Learning Activity

Reflecting Responsibility Communicating

33.8 'Higher taxes will pay for better health care.' Have a class discussion on whether you would be willing, when you are earning, to pay higher taxes if it means the health care in the country could be improved. Justify any comments you make.

India

Health care is one of the more **challenging** areas of Indian society. The major cities have fine hospitals with modern practices and standards. However, only the wealthy can afford to pay for hospital care. Health insurance is not popular among wealthy Indians. More than one billion Indians could not afford health insurance even if they wanted to buy it.

Children are **vaccinated** against infections the same as they are in wealthy countries. All children in cities have vaccination services available to them. However, in the countryside, where 67% of the population lives, the uptake of vaccination services is not as high as it is in cities.

A real challenge arises in the case of a **medical emergency**. In the countryside, a health worker or doctor in the village health centre will decide if the patient can be treated there.

For example:

- The **village health centre** will treat minor ailments such as malaria or a broken bone. Children suffering from gastric and chest infections are given antibiotics. A GP charges about 40 rupees (60 cents) for a visit and medicine. All but the very poor can afford this.
- In a more serious case such as appendicitis, pneumonia or TB, the patient is referred to the **district hospital** in the nearest town, which could be many kilometres away.
- In an emergency case such as a heart attack, organ failure or hepatitis, the patient will be referred to a **city hospital**. The patient may not survive in the time it takes to reach the city hospital.

GEO FACT

Child mortality in India is 48 per 1,000 under the age of 5 (Ireland: 4 per 1,000).

Learning Activity

Curiosity Responsibility

33.9 Using a street plan, map or website, research how many kilometres it is to the nearest emergency department hospital from your school.

Employment opportunities

Ireland

The **employment opportunities** in Ireland were very good in 2017, with almost 2.1 million people at work, mostly in services.

The numbers of people at work in Ireland varies. When the recession of 2008 occurred with the **collapse of the Celtic Tiger**, unemployment rose to more than 15%. Thousands of young people went abroad for work, many of whom have yet to return and may never do so. By October 2017, with the recovery of the economy, unemployment had declined to 6.1%.

There are a number of job opportunities for highly qualified university leavers, such as:

- **High-tech** companies, e.g. Google, Microsoft, Intel, HP and Boston Scientific, which employ graduates in computer sciences and other fields.
- **Financial services**; this is largely because of the International Financial Services Centre – the IFSC – in Dublin. By 2017, more than 500 financial companies and banks located in the IFSC provide almost 40,000 jobs.
- **Biomedical and biotech** multinationals in the medical devices sector are clustered in Galway, employing more than 6,000 people.

However, for some, including early school leavers, these highly skilled jobs are beyond their reach. There are many other jobs that skilled and unskilled people can do, but some people remain unemployed long term. Training programmes are available for people who wish to upgrade their skills.

There is government support for people on low incomes or who are unemployed. Other benefits exist, such as Child Benefit, maternity allowance, sickness benefit and the state pension.

Employment opportunities differ considerably for young women and young men.

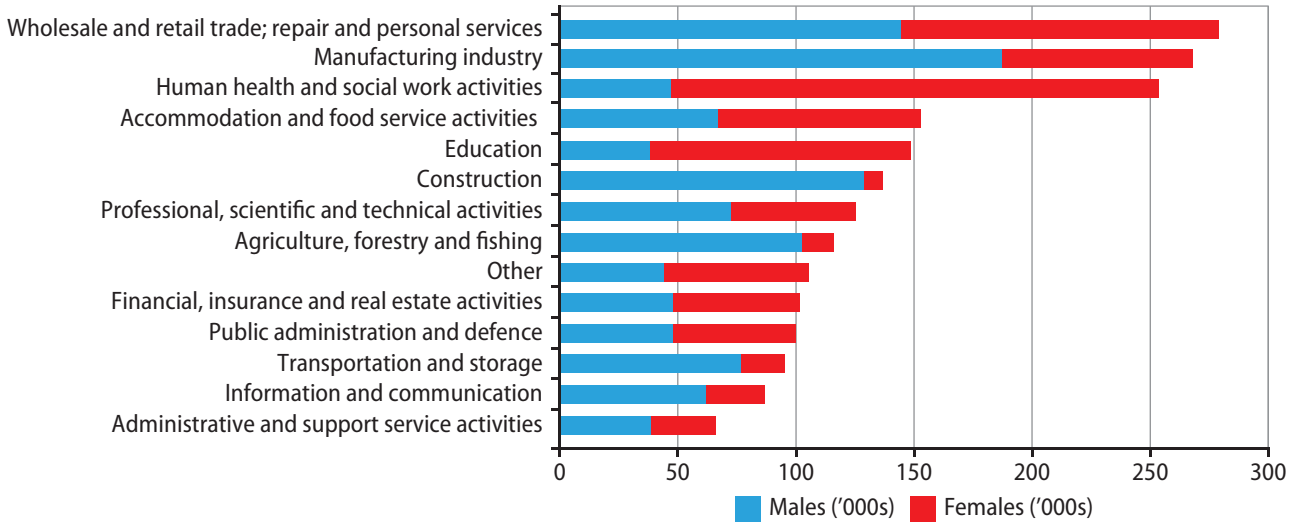


Figure 33.11 **Male and female employment by sector in Ireland, 2016**

Learning Activity

Curiosity Numeracy

33.10 Examine figure 33.11. Answer the following questions.

(a) Which sector employs a roughly equal number of women and men?

(b) (i) Which sector has the highest proportion of women to men?

(ii) Redraw this sector as a pie chart.

(c) (i) Which sector has the highest proportion of men to women?

(ii) Redraw this sector as a pie chart.

(d) If you were explaining inequality to someone, would you present them with the bars from the bar chart, or with the pie charts you have drawn? Justify your answer.

(e) Do you think it is the lack of equal opportunities that give the results shown in figure 33.11, or are the inequalities for other reasons? Explain your answer.

(f) Discuss your answers with your partner and share with the rest of the class.

India

Employment opportunities in India are very different from those in Ireland:

- The majority of people work in the **countryside** on the land. Much farm work is done by hand or with animals. Farmers and farm labourers produce most of the food requirements of the 1.344 billion people of India. Output per person is low.
- Large numbers of people including children work as **brick makers** in brickfields.
- There are jobs in **manufacturing**. They include cotton and clothing **factories** and **heavy industries** such as steel and car assembly.
- Many **call centres** and **printers** are located in India and organisations around the world use them because labour is cheaper than in their own countries.

GEO FACT

Child labour still exists in some parts of India, depriving children of the chance of going to school.

Figure 33.12 **Women at work on a construction site in India**

Figure 33.13 **A call centre in Bangalore, the high-tech centre in India**

If Indian people do not work, they go hungry because there is **no unemployment benefit**, children's allowances or state-provided old-age pensions. Therefore, Indian people are very enterprising, particularly in the cities. For example:

- Working as carriers of goods from shop to customer.
- Selling vegetables and other foods to the passing trade.
- Having street kitchens preparing cooked food.
- Collecting material for recycling, concentrating on one product, such as plastic water bottles, or paper or packaging cardboard.
- Providing services to the huge population, such as driving rickshaws or taxis, making pottery, leather working, shoemaking and carrying out repair work of all kinds.

GEO FACT

One-fifth of India's population of 1.3 billion people (270 million) is living below the poverty line.

For educated people, there are growing opportunities. India is enjoying a high-tech boom. The city of **Bangalore** is India's equivalent of the USA's Silicon Valley. Many children of the wealthy go to college and become engineers. These bright, well-educated young people can work in modern growth sectors such as the computer industry. Many of them move abroad to highly paid jobs.

Link Silicon Valley**: chapter 36,** pages 345-346

Learning Activity

Curiosity Responsibility

33.11 Investigate India's largest employers. Answer these questions.

(a) What is the name of India's largest employer?

(b) How many people does it employ?

(c) What is India's second largest employer?

(d) How many people does it employ?

Check your answers with your partner.

Reflecting on my learning

Reflecting Communicating Literacy

Write sentences using each of the following terms from this chapter. You may use more than one of the terms in your sentence if appropriate.

education | gender equality | life chances | employment | health care

PowerPoint summary

Revision
Go to **www.edco.ie/geographynow** and try the interactive activities and quizzes.

Mountain heights

	metres
Mt Everest (Nepal/China)	8848
K2 (China/Pakistan)	8611
Kangchenjunga (Nepal/India)	8586
Dhaulagiri (Nepal)	8167
Annapurna (Nepal)	8091
Cerro Aconcagua (Argentina)	6959
Nevado Ojos del Salado (Arg./Chile)	6908
Chimborazo (Ecuador)	6310
Denali (USA)	6190
Mt Logan (Canada)	5959

Island areas

	sq. km
Greenland	2 175 600
New Guinea	808 510
Borneo	745 561
Madagascar	587 040
Baffin Island	507 451
Sumatra	473 606
Honshū	227 414
Great Britain	218 476
Victoria Island	217 291
Ellesmere Island	196 236

Continents

	sq. km
Asia	45 036 492
Africa	30 343 578
North America	24 680 331
South America	17 815 420
Antarctica	12 093 000
Europe	9 908 599
Oceania	8 923 000

World Physical

Oceans

	sq. km
Pacific Ocean	166 241 000
Atlantic Ocean	86 557 000
Indian Ocean	73 427 000
Arctic Ocean	9 485 000

Lake areas

	sq. km
Caspian Sea	371 000
Lake Superior	82 100
Lake Victoria	68 800
Lake Huron	59 600
Lake Michigan	57 800
Lake Tanganyika	32 900
Great Bear Lake	31 328
Lake Baikal	30 500
Lake Nyasa	30 044

River lengths

	km
Nile (Africa)	6695
Amazon (S. America)	6516
Chang Jiang (Asia)	6380
Mississippi-Missouri (N. America)	5969
Ob'-Irtysh (Asia)	5568
Yenisey-Angara-Selenga (Asia)	5500
Huang He (Asia)	5464
Congo (Africa)	4667
Río de la Plata–Paraná (S. America)	4500
Mekong (Asia)	4425

Eckert IV projection

World Physical

The Continents

Glossary

abrasion Erosion caused by the load carried by rivers, waves and glaciers.

acid rain Rainwater containing chemicals that occurs as a result of the burning of fuels such as coal and oil.

aerial photograph A photograph taken from a plane, helicopter or drone in flight.

aid Development assistance by rich countries and other organisations to projects in the developing world.

air mass Large body of air that has similar temperature, pressure and moisture throughout.

alluvium Material transported and deposited by a river when it floods.

anticyclone An area of high atmospheric pressure (HP), usually associated with fine, settled weather.

anti-tourism a protest movement against the negative impact of mass tourism on local life and living standards.

aspect The direction in which a slope faces.

atmosphere The layer of gases, including nitrogen and oxygen, surrounding Earth.

attrition Erosion caused when the particles in the load carried by rivers and waves bump off one another.

backwash Water returning to the sea after a wave has broken.

barriers to migration Obstacles that make it more difficult for people to migrate, such as the cost of travel, the risks to life and health on the journey and visa restrictions in the destination country.

Beaufort scale A scale for estimating wind speed and is based on observing its effect on land or sea rather than actual measurements.

bedrock Solid rock that makes up the lowest layer of a soil profile.

biodiversity The variety of plants and animal life in a habitat.

biofuels Energy sources that can be extracted from crops and other organic matter.

birth rate The number of live births per 1,000 people in one year.

boreal Climate belt in northern latitudes that has long, cold winters and short summers; associated with coniferous forests.

boulder clay Mixture of clay and rocks deposited by a glacier.

BRICS A group of rapidly developing countries comprising Brazil, Russia, India, China and South Africa, which support each other in global economic issues.

bridging point A place where a river has been forded or bridged, at which a settlement often develops.

brown earth soil Fertile, well-drained soil that developed where deciduous forests grow.

Burren A distinctive karst (limestone) landscape in County Clare.

carbonation Chemical weathering where rocks such as limestone are broken down by acid in rainwater.

carbon sink Anything (including trees, soil, oceans) that absorbs more carbon dioxide than it releases.

CBD The central business district of a city.

chemical weathering When rocks decay or are dissolved by a chemical change.

child mortality The average number of deaths of children under five years of age per 1,000 live births.

cholera A potentially fatal infection caused by consuming contaminated food or water.

climate The average weather conditions of a region over a long period of time.

climate change Major long-term changes in aspects of climate, including temperature, rainfall and wind.

cloud A visible body of very fine water droplets or ice particles suspended in the atmosphere.

colonisation One country taking political control over another country.

commuters People who travel some distance from their homes to their places of work.

conservation The care, protection and careful use of resources and of the environment.

containerisation A system of freight transport metal boxes, which are transported in trains, trucks and ships.

convection currents Currents in the mantle that move the heated molten magma upwards from the core towards the crust and cause the plates to move.

corporation tax The tax on company profits; MNCs pay to the government of the country in which they operate.

crust The thin, solid outer layer of Earth.

DART Dublin Area Rapid Transit – a commuter railway line along the Dublin coast linking Malahide with Greystones.

death rate The number of deaths per 1,000 people in one year.

deforestation The destruction of forests in order to make land available for other uses.

demographic transition model A model that tells us how birth rates, death rates and natural population growth change over time as an economy develops.

demography The study of the structure of populations.

denudation Breaking up and removing rocks on the Earth's surface by weathering, mass movement and erosion.

deposition The laying down of the load transported by rivers, waves and ice.

depression An area of low atmospheric pressure (LP), usually associated with wet, cloudy and windy weather.

desertification The gradual spread of desert conditions into surrounding areas.

developed countries Countries that are wealthy, have good services and a high standard of living; also known as the North.

developing countries Countries that are poor, with few services and a low standard of living; also known as the South.

development The use of resources and technology to improve people's standard of living and quality of life.

doldrums Areas of low pressure and slack winds near the equator.

dormitory town A town to which people return home after their day's work.

drainage basin The area of land drained by a single river and its tributaries.

earthquake A sudden movement within Earth's crust, usually close to a plate boundary.

economic core A region that is the economic driver of a national economy, such as the Dublin region in Ireland.

economic migrant A person who has moved in search of work.

ecosystem A biological community of organisms that interact with each other and with their physical environment.

ecotourism Tourism that aims to reduce the impact that tourism has on the environment.

emigrant A person who leaves a country to live elsewhere.

entrepreneurial culture The can-do attitude of a group of people or of individuals who take economic risks to develop a company, product or service.

environment The living conditions in which people, animals and plants exist.

erosion The breaking down of rocks and the removal of the resulting particles by rivers, waves and ice.

exploitation Making use of and benefiting from resources.

export processing zones Industrial estates, mainly in developing countries such as China, where goods are manufactured for export.

fold mountains Mountains formed when rocks buckled and folded as two plates collided.

footloose industry An industry that is not tied to raw materials and has a wide choice of location.

Fossil Remains of a plant or animal that has been preserved in a layer of rock.

fossil fuels Fuels such as coal, oil and natural gas that developed over time from the remains of plants and animals.

freeze-thaw Mechanical weathering where rocks are broken down due to water in cracks repeatedly freezing and thawing.

front The dividing line (cold front or warm front) between two air masses that have different temperatures and pressures.

gender equality Where access to all rights and opportunities are not affected by gender.

gender segregation The separation of the sexes by custom, rules, laws and policies.

geothermal energy Heat that comes from inside Earth in the form of hot water or steam. It can be used to heat buildings or generate electricity.

glacier A large, slow-moving mass of ice flowing down a valley.

globalisation The process by which the world is increasingly connected by trade and cultural links.

global warming The gradual rise in Earth's temperature caused by increased levels of greenhouse gases in the atmosphere.

granary A region that produces large quantities of grain.

greenhouse effect The process where gases in Earth's atmosphere traps solar radiation. It can be natural or human enhanced.

greenhouse gases Gases that trap heat within the atmosphere, creating the greenhouse effect.

high-tech manufacturer A company at the cutting edge of innovation in fields such as computer engineering, space technology and communications.

horizon One of the layers that make up a soil profile.

horse latitudes Areas of high pressure and rising air, about 30°N and 30°S of the equator.

human development index (HDI) This index ranks countries according to life expectancy, educational levels and income per person.

hurricane A powerful storm with continuous wind speeds over 120 kph.

hydraulic action Erosion caused by the power of moving water in rivers or waves.

Ice Age A time when vast areas of Earth were covered by ice sheets.

ice sheet Moving mass of ice that covers a large land area.

igneous rock A rock that formed from the cooling of molten magma or lava.

immigrant A person who enters a country with the intention of living there.

impermeable rock Rock that does not allow water to pass through it.

industrial estates An area where several manufacturing companies are located, often on the edge of a town or city.

infrastructure Networks such as road, rail, electricity, water, telephone and broadband.

inner city The area of the city with older housing and industries that is located next to the city centre.

Irish Aid Development assistance given by the Irish government to some countries in the developing world.

irrigation Supplying dry agricultural land with water in order to grow crops.

karst An area of limestone with surface and underground features that result from chemical weathering.

landslide The very rapid movement of earth and rock (regolith) down a steep slope.

latitude The angular distance north or south of the equator.

life chances The opportunities that people have to improve their quality of life.

life expectancy The average number of years that a person in a given country is expected to live.

light industry Manufacturing activity, such as fashion and hi-fi equipment, that uses moderate amounts of raw materials.

longshore drift The zigzag movement of material along a coastline by waves.

Luas A light rail system linking Dublin city centre with Tallaght and Bride's Glen.

magma The molten or semi-molten material that makes up Earth's mantle.

mantle The layer of molten rock between Earth's crust and core.

market A place where goods are bought and sold, or a group of people who buy goods.

mass movement The movement down-slope of loose material under the influence of gravity.

mechanical weathering When rock is broken down into small pieces by freeze-thaw and plant roots.

metamorphic rock A rock that has been changed by extremes of heat and pressure.

meteorology The study of weather.

migration The movement of people from one area to another to live and often to work.

mudflow Moving rivers of rock, soil and water.

multinational companies Companies with a base in more than one country.

natural resource A material or product that is found in nature and is used by people.

navigable river A river that can be used for barge traffic.

NGOs Non-governmental organisations, e.g. voluntary agencies that provide assistance to projects in the developing world.

non-renewable resource A finite resource that will eventually run out or be depleted, such as oil.

North Atlantic Drift Warm ocean current that begins as the Gulf Stream and warms the waters off Ireland's coast.

nucleated settlement A cluster of buildings and inhabitants in a particular location.

ocean current Regular patterns of water flowing like giant rivers through the oceans.

Ordnance Survey Ordnance Survey Ireland (OSi) is the national mapping agency of this country.

outsource To obtain goods and services from a supplier abroad.

overexploitation Using a renewable resource such as fish and forestry resources faster than they can be replaced.

Pangaea The single land mass (supercontinent) that later broke up to form the continents.

permeable rock Rock that allows water to pass through it.

petrodollars Revenues earned from the export of oil and oil products.

plate boundary The place where two plates meet. It is associated with volcanoes, fold mountains and earthquakes.

plate tectonics The theory that Earth's crust is divided into a number of moving plates, leading to folding, volcanic and earthquake activity.

plates The separate sections into which Earth's crust is broken.

plucking Erosion where blocks of rock are torn out by moving ice.

podzol Soil that formed in cold, wet areas that had a cover of coniferous forest.

pollution Noise, harmful substances and dirt produced by people and machines.

population cycle (the demographic transition model) Shows how changes in birth and death rates over time are related to a country's development.

population density The average number of people living in an area, usually per km2.

population distribution The spread of people over an area.

population explosion A sudden rapid increase in the population of a region.

population pyramid A bar chart displaying the population structure of an area.

population structure The composition of a country's population by age and sex.

precipitation All forms of moisture from the atmosphere, including rainfall, snow, hail and fog.

prevailing wind The direction from which the wind blows most frequently.

primary activities Economic activities where resource materials are extracted from the land and the sea.

pull factors Things that attract people to live in an area.

push factors Things that make people decide to leave an area.

Reafforestation Replanting trees on land that had previously been forest and but had been deforested.

regolith Loose material (rocks and soil) that covers the surface of Earth.

relief The shape and height of the land.

renewable resource A non-finite resource such as wind power or solar energy that can be used over and over again.

resource Any material or product that people find useful.

Richter scale A scale by which the strength of an earthquake is described.

Sahel A region at the southern edge of the Sahara Desert that is affected by desertification.

satellite image Image of Earth taken from a satellite in space.

scree Loose pieces of rock with sharp edges. They are broken off by freeze-thaw and gather at the foot of a slope.

secondary activities Economic activities where raw materials are processed into products.

sedimentary rock A rock formed from sediments that were laid down and compressed over millions of years.

seismometer (seismograph) An instrument used to measure (and record) the strength of an earthquake.

settlement The manner in which an area is settled by people, either as rural dwellers or in towns and cities.

Silicon Valley The nickname for the urban area south of San Francisco where many high-tech companies operate.

smart economy An economy that has efficient public transport, efficient energy use, cutting-edge technologies, advanced waste management and highly educated workers.

soil The thin layer of loose material on Earth's surface.

soil creep The slow, down-slope movement of soil under the influence of gravity.

soil erosion The removal of fertile topsoil by wind, rain and running water.

soil profile A cross-section of a soil that is made up of a number of layers (horizons).

solar energy Energy from the sun, giving heat and light to Earth.

solution When a mineral in rock is dissolved in water and carried away in solution.

special economic zones (SEZs) Specific areas in a country, such as on the coast of China, where investment, job growth and the export of goods are encouraged.

start-up A newly established business – usually by an entrepreneur who has developed an innovative product.

street plan A map of an urban area showing the layout and names of all the streets as well as important buildings and spaces.

Sub-Saharan Africa The region of Africa that lies south of the Sahara Desert.

suburb A mainly residential area on the edge of a city.

sustainability The use of resources in such a way that the needs of the present generation are met and the resource needs of future generations are not jeopardised.

sustainable development A way of improving people's standards of living and quality of life without damaging the environment or putting the wellbeing of future generations at risk.

sustainable tourism Tourism that has a low impact on travel, the environment and culture, while providing greater economic benefit for locals.

swash The movement of water up a beach after a wave breaks.

synthesis The bringing together or linking the different parts or components of a theme.

synoptic chart A map that summarises weather conditions over an area by the use of symbols.

tariffs Taxes placed on goods when they are imported.

terrain The physical features of a land area.

tertiary activities Activities that provide a service to people, such as health and tourism.

tiger economies The name given to several countries in East Asia such as South Korea and Taiwan, which became wealthy in recent decades because of export-orientated manufacturing.

trade The movement and sale of goods and services between countries.

tremors Series of shock waves that run through the rocks of the crust after an earthquake.

tsunami A huge wave that is caused by an underwater earthquake.

urban regeneration The redevelopment or renewal of a run-down or derelict are of a city.

urban sprawl The expansion of a city into the countryside in an unplanned and uncontrolled way.

volcano A cone-shaped mountain formed by the eruption of magma from inside Earth to the surface.

water cycle The continual recycling of water as it passes between the atmosphere, the oceans and the land.

weather The day-to-day condition of the atmosphere, including temperature, precipitation, sunshine and wind.

weathering The breakdown and decay of rocks by mechanical (freeze-thaw) and chemical (carbonation) processes.

Women's Liberation Movement A women's pressure group from the 1970s aimed at equal rights for women.

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Geography Now!

New Junior Cycle

DRAFT EXTRACT

Geography Now! adheres to the vision and concepts that are outlined in the Junior Cycle Geography specification. The development of students' knowledge and skills in order to understand the world around them is paramount throughout the textbook.

- Each of the learning outcomes and key skills is comprehensively covered
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- Definitions and geo facts are inserted throughout the book
- The many activities in each chapter aid understanding and encourage students to work together to research and problem-solve
- Engaging content is complemented with relevant and up-to-date examples
- The skills required to study OS maps, aerial photographs and satellite images are a priority in the text and are reinforced throughout the other topics
- Students are encouraged to consider, discuss, debate and offer their opinions on a number of subjects, including the environment, sustainability and inclusivity
- Linkages between topics provide opportunities to examine the material in a non-linear way
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