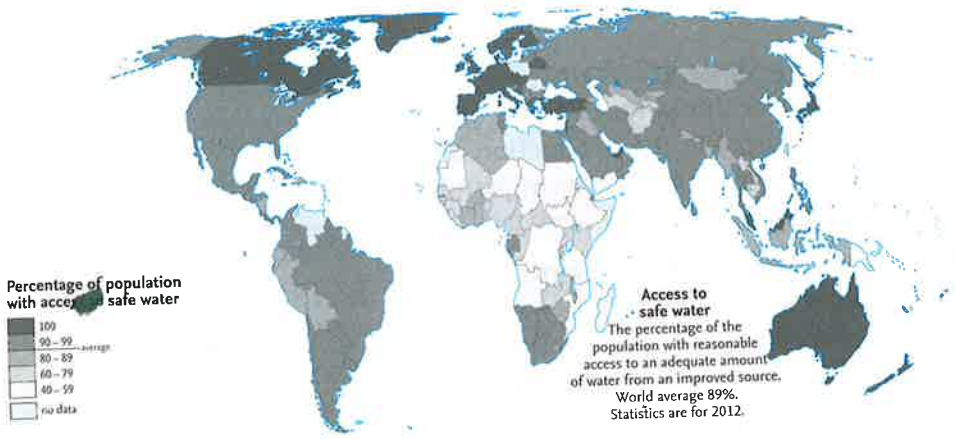
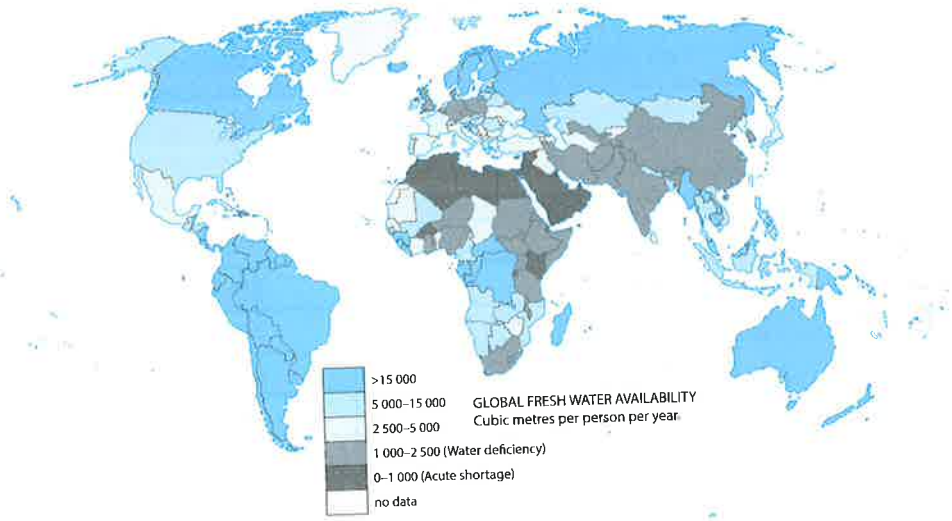
Why are there water shortages in some areas?



Many people have unlimited access to clean drinking water. However, there are over 1 billion people who struggle to get enough water to meet their **basic human needs**. This number is likely to increase to 4 billion people by 2050. There is not a lack of water but the main problem is accessibility. This is because rain does not always fall where it is most needed.



Where there is a **water deficit** people are trying to use water more sustainably. They are trying to reduce the total use whilst meeting people's increasing needs. For example, reducing **irrigation** by 10% could double the amount of water available for **domestic water**.

Revision tip

It is important to remember that there is enough water on the planet; the problem is that it is not distributed equally.

Activity

Think about all of the things that you do each day that you would struggle to do if you did not have access to clean water. Write a paragraph to explain how your life would be different.

How can this issue be managed?

Managing water use sustainably can be done on a variety of scales. For example, at an individual level, washing dishes or washing the car by hand uses less water than using a dishwasher or car wash. At a larger scale and in agriculture, **drip-irrigation** uses less water than methods such as **flood irrigation**. However, at a national scale it is often difficult for countries to agree how they will manage the issue. This is because rivers often run through several countries and actions in one place will have knock-on effects elsewhere.

The River Nile passes through 10 countries before reaching Egypt. Egyptian farmers use water from the Nile for irrigation. The country has built dams, such as the Aswan High Dam, to store water from the Nile. This has allowed the growing of crops such as rice and cotton. An agreement has been signed by countries in the Nile basin to promote sustainable use of the river water. However, the population in this area is expected to double to 160 million by 2040. Countries are demanding more water to grow food and generate power for this growing population. This tension has split the countries and could result in conflict.

What case studies do I need?

You need case studies on:

- Water supply in a country or area, e.g. water supply in northern India.

Quick test

1. What is an aquifer?
2. What do LEDCs tend to use most of their water for?
3. Give an example of a place that faces a water deficit.
4. What is domestic water?
5. Suggest **one** way in which water can be used more sustainably.

Revision tip

Don't forget that issues such as access to clean water need solutions that operate at different scales from the individual level to the international level.

Activity

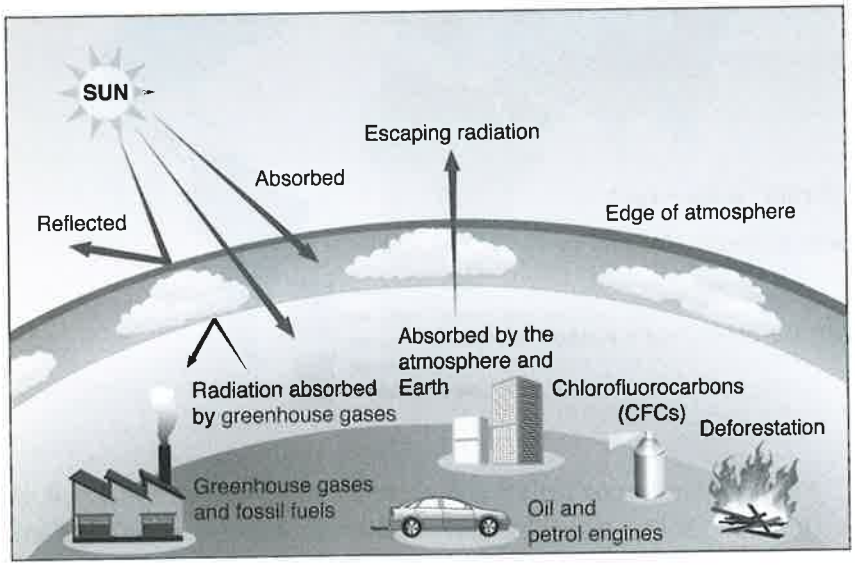
Write a list of ways in which you could use water more sustainably. For example, you could turn off the tap while brushing your teeth or take a shower rather than a bath.

3.7 Environmental risks of economic development

How might economic activities pose a threat to the natural environment?

Economic activities such as agriculture, industry, tourism and power generation have many benefits. However, they also have the potential to harm the natural environment in a number of ways:

- **Soil erosion** – in tropical areas, if deforestation occurs there is nothing to protect the soil from frequent and heavy rain. **Gullies** are formed and the soil is washed away. In drier areas, the wind causes soil to erode. Once vegetation cover has been removed, the soil dries out and is blown away. This soil can be transported huge distances and be washed into rivers. This can reduce water quality, affect wildlife and cause flooding.
- **Desertification** – this is the process where semi-arid environments change to become more desert-like. It is not the spread of deserts, but rather what is happening to the areas next to them. For example, in the Sahel, every year 80 000km² becomes too dry and infertile for farming. Climate change is a major cause of desertification as it increases temperatures and changes seasonal rainfall patterns.

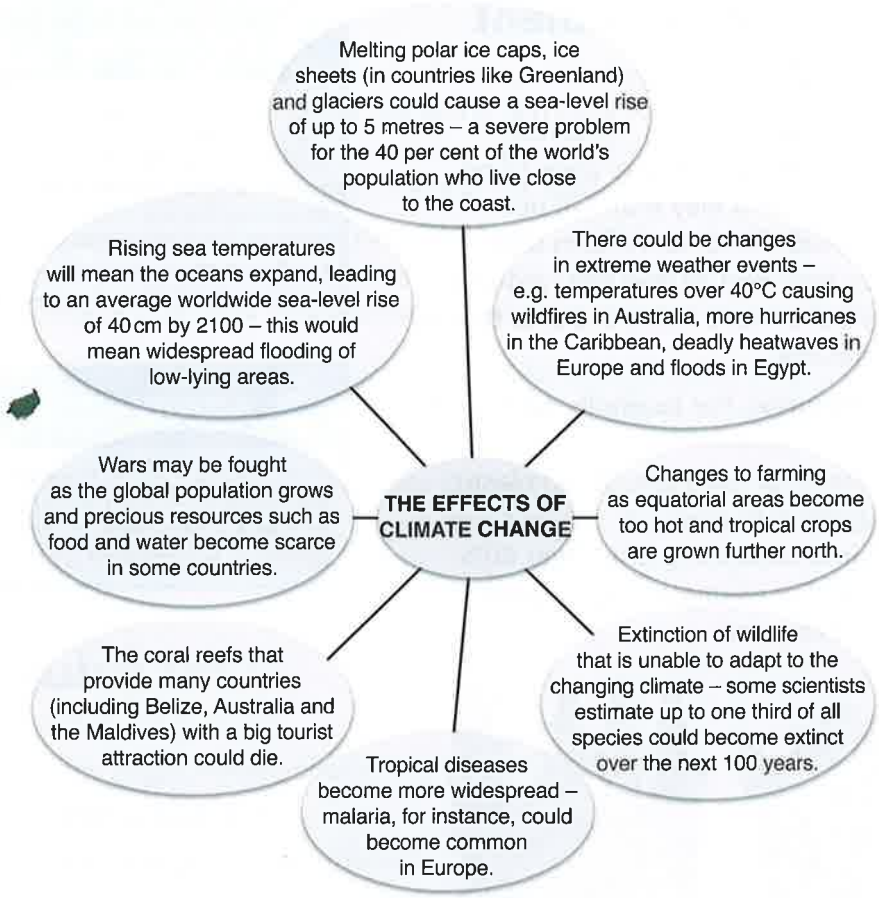


- Enhanced global warming – **greenhouse gases** are produced by burning fossil fuels, deforestation, using agricultural fertilisers and from decaying waste and vegetation. As the world's population grows, so the amount of these gases increases. This traps more heat in the atmosphere and causes temperatures to rise. As a result, sea levels are likely to rise, there are likely to be more frequent and more extreme weather events and coral bleaching could occur.

Topic summary

You must be able to:

- Describe how economic activities may pose threats to the natural environment, locally and globally
- Demonstrate the need for sustainable development and management
- Understand the importance of resource conservation.



Revision tip

Don't forget that economic activities may have economic or social disadvantages too. It's also worth remembering that economic activities can be beneficial to the natural environment – although the focus of this unit is very much on the risks.

Activity

Carry out some research on a place that has experienced either severe soil erosion or desertification. Create a poster showing what the causes and impacts are.

- Water pollution – water used for industrial cooling can be returned to the river containing **toxic** chemicals. The water is **contaminated** and cannot be used for drinking supplies or irrigation. Similarly, pollutants can enter **groundwater** supplies from factory or power station leaks. These supplies are often pumped to the surface through wells for drinking water.
- Air pollution – smoke from factories and exhaust fumes from cars, lorries and aircraft can cause breathing difficulties for people living nearby. Coal dust produced from mining can have a similar effect. Some chemicals react with water in the atmosphere and fall to the ground as **acid rain**.
- Noise pollution – most people can live safely with noise of up to about 80 **decibels**. This is the equivalent of car traffic or people talking in a crowded room. However, noise which is louder than this, for example, aircraft taking off and landing, can damage people's hearing.
- Visual pollution – some people may consider structures or buildings as **aesthetically damaging**. For example, some people think that wind turbines or new houses can make rural areas visually polluted.

Revision tip

Whilst water, air and noise pollution can all be measured, visual pollution is more **subjective** and different people are affected in different ways. It is therefore sometimes harder to manage than other forms of pollution.

Activity

Is there anywhere near where you live which is polluted? How is it polluted? What has been done to manage the pollution?

Why do we need sustainable management and resource conservation?

The way we use natural resources can be very damaging. However, governments and organisations are looking for alternative ways to be more sustainable. This means using resources in a way that will not leave permanent damage for future generations. Governments and organisations can carry out research into how best to manage resources sustainably and create policy to change behaviours. There are also things that individuals can do to be more sustainable.

- Reduce – reduce the use of natural resources. For example, turn off the heating and wear an extra jumper.
- Reuse – use things you have more often. For example, fill up plastic water bottles at home instead of buying new ones.
- Recycle – make something you own into something else. Over 80% of household waste can be used again. For example, paper, glass, computers and video games can all be recycled.

Bins with paper, plastic, glass, food, metal and electronic waste sorted for recycling

Revision tip

It is important that issues such as these are managed on a variety of scales from individual to national (and sometimes international). Remember the 3 Rs – reduce, reuse, recycle – to suggest ways in which individuals may help.

Activity

Try to find out the percentage of things that are recycled in your local area. What more could be done to raise this percentage?

National Parks

National Parks are one way in which we can conserve the natural environment. In most parts of the world National Parks are **wilderness** areas, although in the UK they are found in areas of countryside where people live and work. The main aims of UK National Parks are:

- To maintain and improve natural beauty, wildlife and culture
- To help the public understand and enjoy their special qualities
- To make sure local communities can survive economically and socially.

What case studies do I need?

You need case studies on:

- An area where economic development is taking place, causing the environment to be at risk, e.g. the Aral Sea, Greenland, Borneo or the Great Barrier Reef.

Quick test

1. What are gullies?
2. Why might noise pollution be hazardous?
3. What is acid rain?
4. Why is recycling sustainable?
5. What are National Parks?

Revision tip

National Parks are one way to conserve the environment on a large scale but they are not the only way. What other methods of large-scale conservation can you think of?

Activity

Research a National Park in your country. Produce a factfile with the main things that you discover.

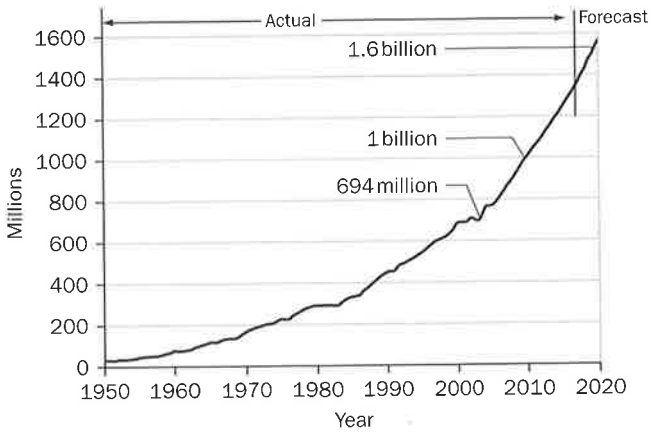
Exam-style practice questions – Theme 3

1 The photograph above shows farmers involved in agribusiness. Define what is meant by 'agribusiness'.

.....

[1]

2 Look at the graph below, which shows the growth of global tourism from 1950–2020.



Describe how the total number of tourists has changed over the last 50 years.

.....

.....

[2]

3 Science parks are places where high-tech companies tend to be located. Suggest three characteristics of science parks.

.....

.....

..... [3]

4 Many parts of the world face a shortage of water. Explain why some areas face these water deficits.

.....

.....

..... [3]

5 Economic activities such as agriculture, industry, tourism and electricity generation all have benefits to the countries in which they take place. However, they can also cause a number of problems. Suggest how economic activity may pose a threat to the natural environment.

.....

.....

.....

.....

..... [4]

6 The photograph shows a nuclear power station. Describe the benefits of nuclear power.

.....

.....

.....

.....

.....

..... [4]

7 Transnational Corporations (TNCs) are large, global companies which have their headquarters in an MEDC and usually have a number of factories in LEDCs. Describe and explain the advantages and disadvantages of a TNC you have studied.

[7]

Preparing for geographical skills examinations

There are a large number of geographical skills that you have to be familiar with and be able to use and interpret. Don't forget to take a pencil, rubber, ruler, a protractor and a calculator into the exam room with you. It's also useful to have access to a sheet of plain paper for measuring distance or for assisting with cross-sections on the large-scale map.

The Paper 2 Geographical Skills exam is 1 hour and 30 minutes long and the total number of marks available is 60. You could consider allocating about a minute and a half per mark. Roughly, this means that you would be allowing yourself 30 minutes to answer the map question and 50 minutes to answer the other questions. You could then use the remaining 10 minutes to check your answers.

Use the audit below to assess how confident you are with the various geographical skills.

Geographical skill			
Four-figure grid references			
Six-figure grid references			
Compass directions			
Measuring horizontal distances on a map			
Contour reading			
Interpretation of cross-sections			
Translate the scale of a feature by describing its size and shape			
Draw inferences about the physical and human landscape			
Identify and describe basic landscape features			
Describe variations in land use			
Pictograms			
Line graphs			
Bar graphs			
Divided bar graphs			
Histograms			
Kite diagrams			
Flow diagrams			
Wind rose graphs			
Dispersion graphs			
Isoline maps			
Scatter graphs			
Choropleth maps			
Pie graphs			
Triangular graphs			

Geographical skill			
Radial graphs			
Describe and analyse features from data tables			
Show an understanding of written material			
Describe human and physical landscapes on:			
Photographs			
Aerial photographs			
Satellite images			
GIS			
Describe and annotate field sketches			
Interpreting cartoons			

Now, have a go at the following questions.

1 Study Fig. 5, which shows the structure of the total New Zealand population, and Fig. 6, which shows the structure of the Maori population in 2006. The Maori people form part of the population of New Zealand.

Total New Zealand population, 2006

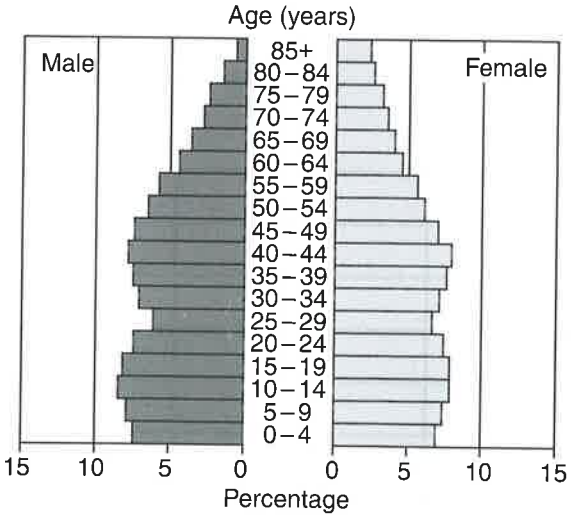


Fig. 5

Maori population, 2006

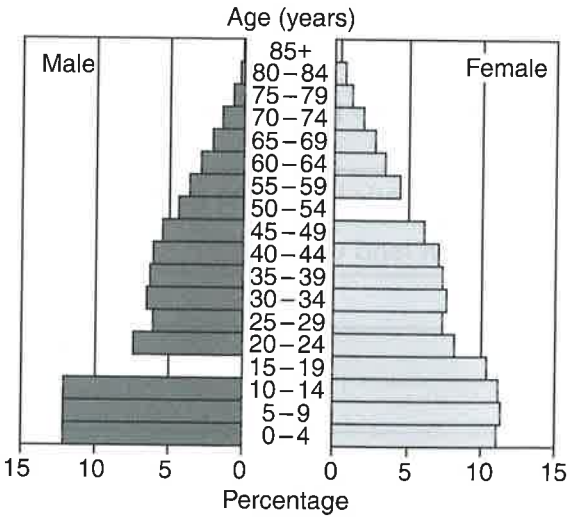


Fig. 6

(a) In 2006, 10% of the male Maori population were aged 15–19 and 5% of the female Maori population were aged 50–54. Complete Fig. 6 by adding this data. [2]

(b) Complete the following sentences by adding the words **greater** or **less**.

(i) The percentage of 0–14 year olds in the Maori population is ..... than the percentage of 0–14 year olds in the total New Zealand population. [1]

(ii) The percentage of over 55 year olds in the Maori population is ..... than the percentage of over 55 year olds in the total New Zealand population. [1]

(iii) The percentage of over 35–49 year olds in the Maori population is ..... than the percentage of over 35–39 year olds in the total New Zealand population. [1]

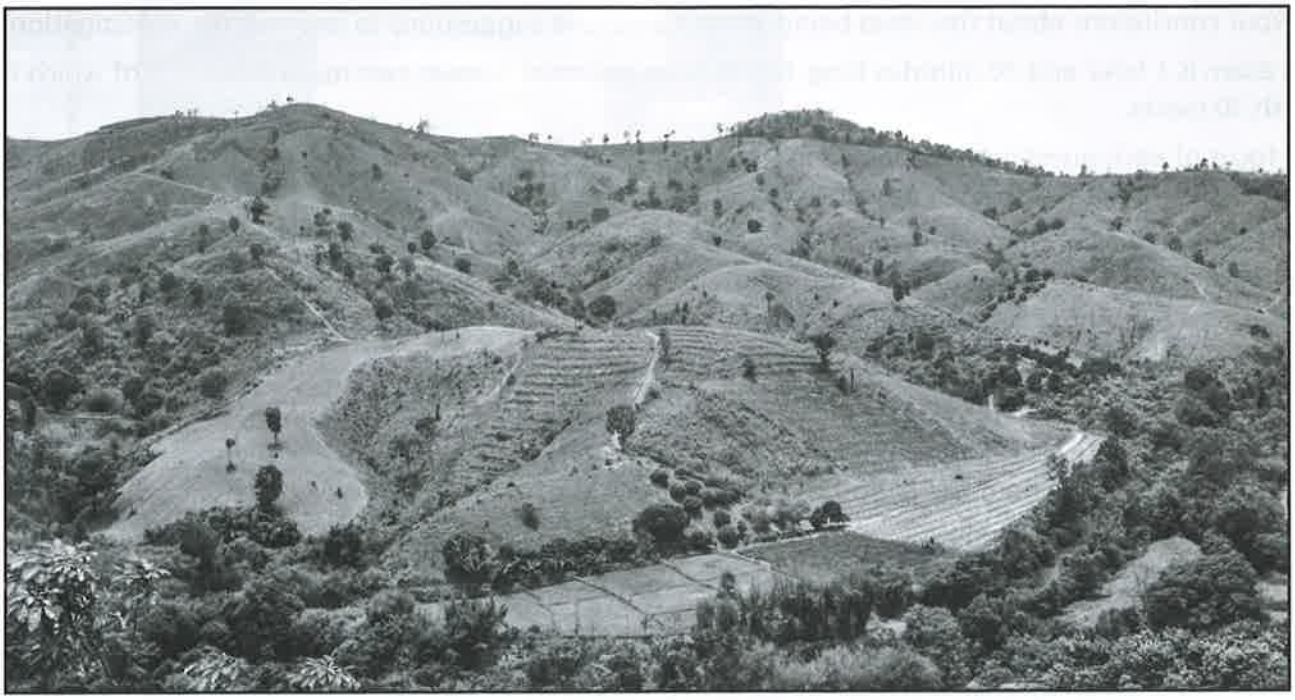
(c) In 2006, the Maori population formed 14% of the total New Zealand population.

(i) Using evidence from Figs 5 and 6 only, suggest how this may change over the next 50 years. [1]

(ii) Explain your answer to **(c) (i)**. [2] [Total: 8 marks]

(Cambridge IGCSE Geography 0460 Paper 2 Q2 June 2009)

2 Photograph A (below) shows an area of small-scale subsistence agriculture in Asia.



(a) Describe the relief of the area shown in Photograph A. [4]

(b) The natural vegetation of the area is tropical rainforest but the forest has been affected by human activity. Which of the following statements describe the distribution of forest shown in Photograph A? Circle **two** correct statements.

- covering the whole area
- on the highest land
- on the steepest slopes
- in valleys
- completely removed

[2]

(c) Soil erosion is a problem in the area shown in Photograph A. What features shown in the photograph may encourage soil erosion? [2] [Total: 8 marks]

(Cambridge IGCSE Geography 0460 Paper 2 Q3 June 2009)

Preparing for geographical investigation examinations

For the Cambridge O Level you will sit Paper 3 (Geographical Investigations), whereas for the Cambridge IGCSE you will have a choice between Paper 3 (Coursework) and Paper 4 which is an alternative examination paper which you sit if you do not do a coursework assignment. The coverage of Paper 3 in the O Level and Paper 4 in the IGCSE are the same and so you can use this section of the revision guide to help you prepare prepare for either exam.

The examination tests:

- Your understanding of the ideas being investigated
- Collection and presentation of data and your analysis of this data
- Your conclusions about the ideas being investigated and suggestions to improve the investigation.

This exam is 1 hour and 30 minutes long. In this time you must answer two questions, each of which is worth 30 marks.

The focus of each question is explained in the introduction, which 'sets the scene'. Each question then includes two hypotheses which describe what is being tested in order to reach a conclusion.

In order to do well in this exam you will need to have experience of fieldwork. This can be carried out around the school site, local area or further afield. You should follow the route to enquiry outlined below.

1. Create a hypothesis or key question.
2. Collect relevant data.
3. Present the data in maps and graphs.
4. Analyse the data you have collected.
5. Draw conclusions about the hypothesis and evaluate the investigation.

It is important that you take care when plotting data because your answers need to be accurate. Look at the two answers (A and B) to each task below and decide which answer is correct.

Task 1: Use the results in the table below to complete Fig. 4, to show the average height of vegetation at points 8, 9, 10 and 11 across the transect at Site A.

sample point	1	2	3	4	5	6	7	8	9	10	11
average height of vegetation (cm)	14	11	7	4	2	0	3	4	5	12	17

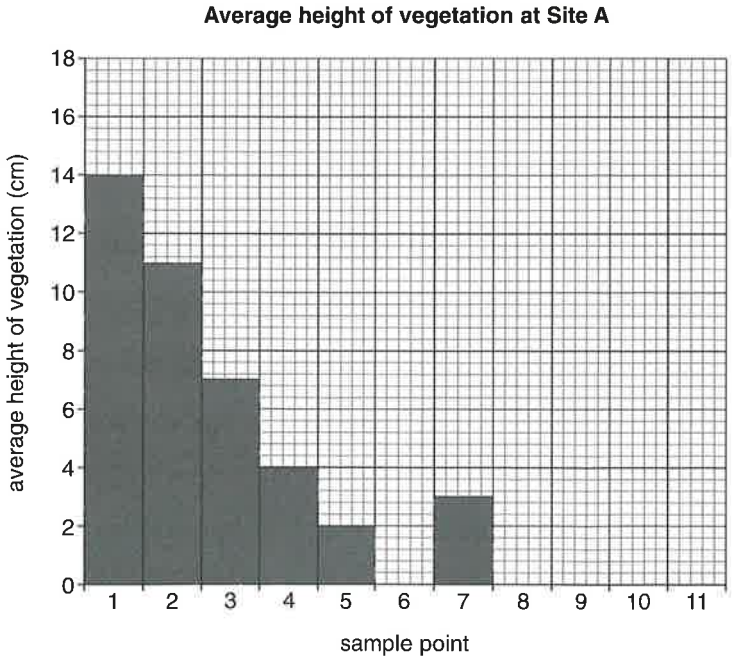


Fig. 4

Look at the two answers (A and B) and decide which answer is correct.

Answer A

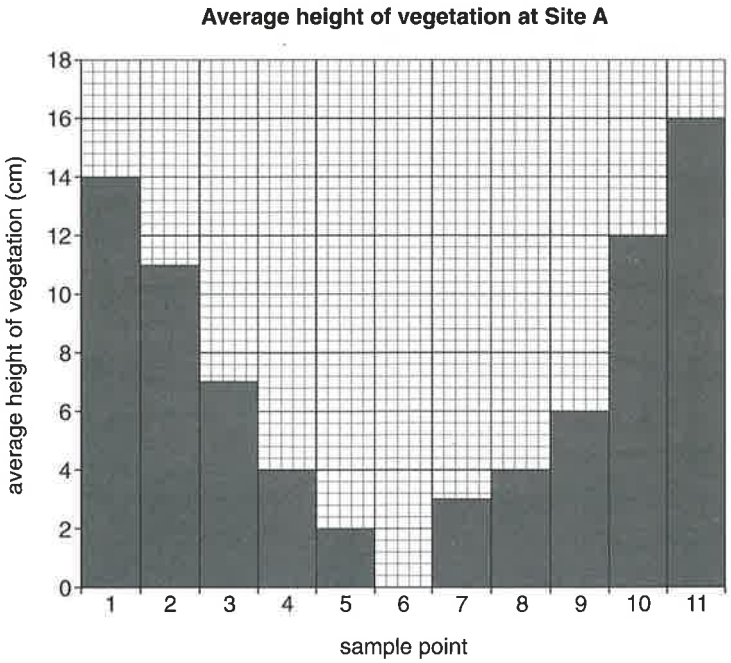


Fig. 4

Answer B

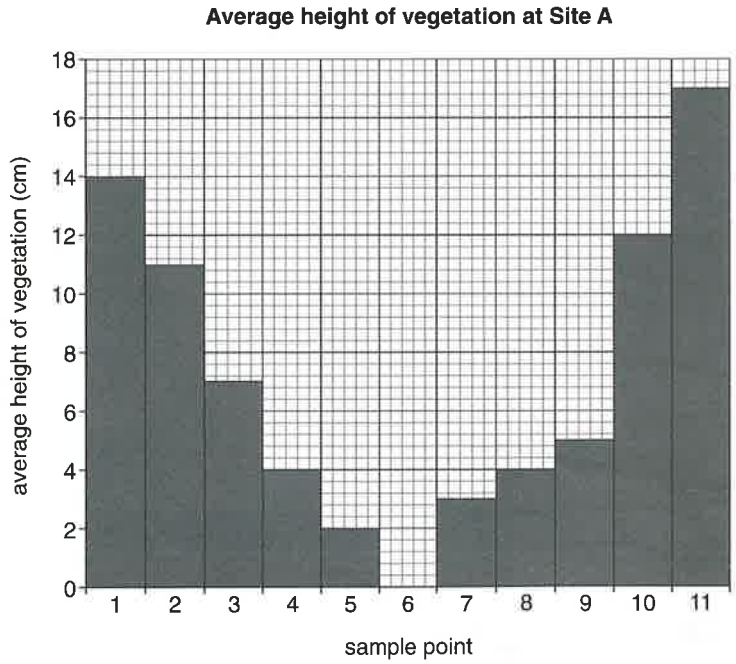
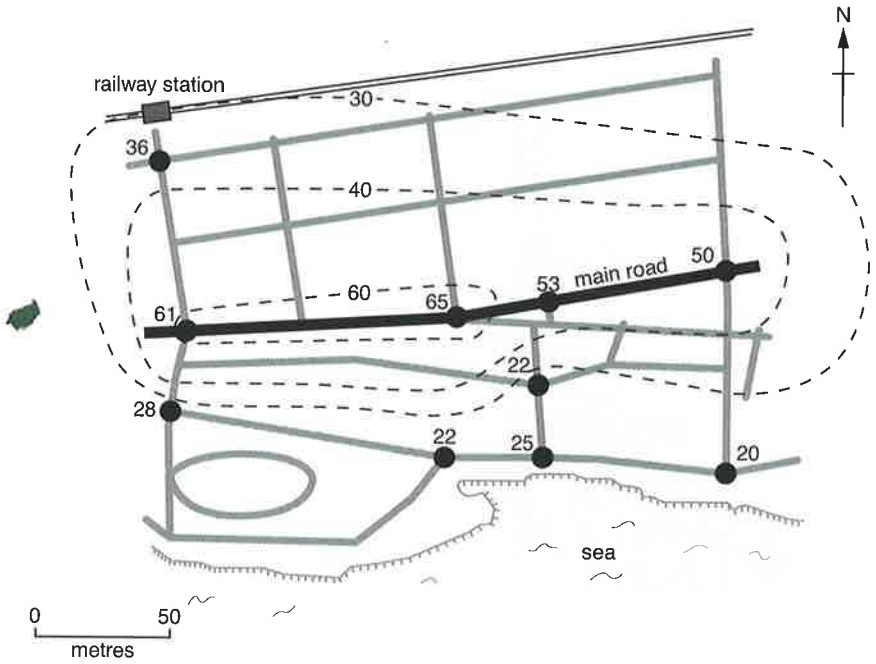


Fig. 4

Task 2: On Fig. 3 shade in the land valued above 60 thousand US$/m².

(Adapted from Cambridge IGCSE Geography 0460 Paper 4 Q1f (ii) June 2007)



Key

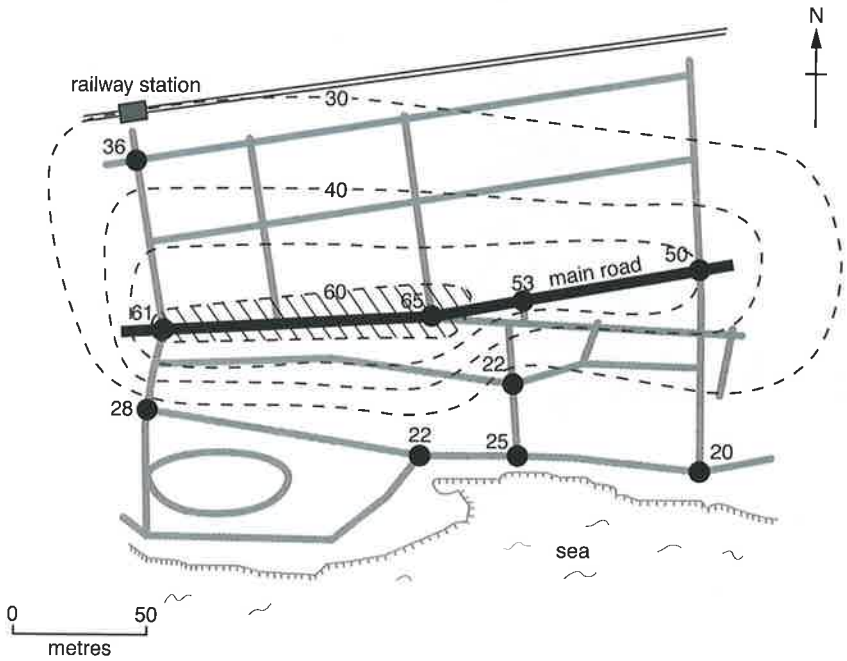
– -60- – isoline of land value (thousand US$/m²)

minor road

Fig. 3

Look at the two answers (A and B) and decide which answer is correct.

Answer A



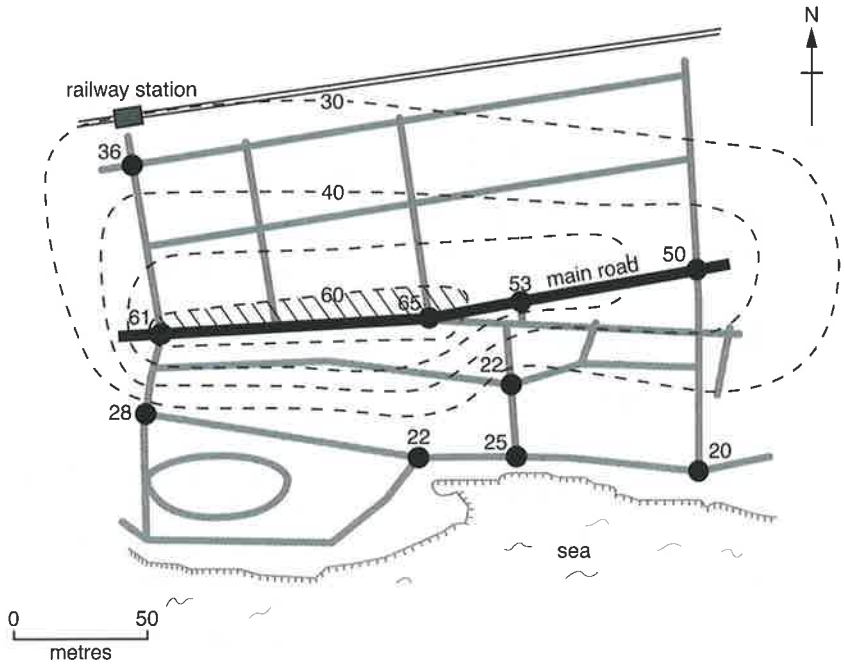
Key

– -60- – isoline of land value (thousand US$/m²)

minor road

Fig. 3

Answer B



Key

– -60- – isoline of land value (thousand US$/m^2)

minor road

Fig. 3

Glossary

1.1 Population dynamics

Anti-natalist policies – strategies designed to limit a country's population growth, for example the one-child policy in China.

Birth rate – the average number of live births in a year (for every 1000 people).

Death rate – the average number of deaths in a year (for every 1000 people).

Infant mortality rate – the proportion of children dying at birth or before their first birthday.

LICE – an acronym that stands for: Life expectancy, Infant mortality, Care of the elderly, and Economic.

Migration – the movement of people from one place to another.

Natural change – the birth rate minus the death rate. If the answer is positive, the population is increasing. If the answer is negative then the population is decreasing.

Over-population – when a country does not have the resources to give all of its people an adequate standard of living. For example, Tanzania.

Population explosion – the dramatic rise in world population which took place during the last two centuries.

Pro-natalist policies – strategies designed to stimulate a country's population growth by increasing its fertility rate. For example, France.

Under-population – describes an area where the population is well below that which can be supported by its natural resources. For example, Canada.

1.2 Migration

Destination – the place where migrants are travelling to.

Economic migrants – people who migrate to find work.

Emigrants – people leaving a country.

Forced migration – when people are made to leave a country, for example because of war or natural disaster.

Immigrants – people arriving in a new country.

Origin – the place where migrants come from.

Permanent – where the migrant stays in one place for a long period of time.

Pull factors – factors encouraging people to move to an area.

Push factors – factors encouraging people to move from an area.

Refugees – people who are forced to move, often by war or natural disaster.

Temporary – where a migrant stays in one place for a short period of time before migrating again.

Voluntary – when people choose to leave an area.

1.3 Population structure

Age dependency – the link between the number of adult people who create wealth and the young and elderly population who depend on them for support.

Age/sex pyramid – a diagram that uses horizontal bar graphs to show the age/gender characteristics of a population.

Ageing populations – a country or area with a large proportion of elderly dependents.

Elderly dependents – elderly people who are retired and dependent upon the working population.

Materialistic – as wealth increases people become more concerned with material possessions.

Pensions – money paid to people after retirement.

Population structure – the way a population is composed of different age/gender groups.

Youthful dependents – young people who do not work and who are dependent upon the working population.

Youthful populations – a country or area with a large proportion of youthful dependents.

1.4 Population density and distribution

Cash crops – a crop grown to sell for profit.

Densely populated – describes an area where a lot of people live (often a large number of people per km^2).

Desertification – the process in which semi-arid environments change to become more desert-like.

Extreme environments – environments which have very high or very low temperatures, very high or very low amounts of precipitation or which are mountainous can be described as extreme. It is difficult for people to live there.

Famine – the long-term situation where people do not have enough food to eat.

Population density – the number of people living in a $1km^2$ area.

Population distribution – the way in which a population is spread out over an area.

Soil degradation – the process of soil becoming less fertile.

Sparsely populated – describes an area (usually in km^2) where few people live.

Uninhabited – describes an area where very few, if any, people live.

1.5 Settlements and service provision

Catchment area – the area served by the shops and other facilities in an urban settlement. Also known as the sphere of influence.

Dispersed – describes the way that isolated farms or houses are scattered over an area, far apart from each other.

Function – the way that a place provides employment and services for the people who live in or visit it.

Linear – describes long, narrow-shaped settlements, often built along a road.

Nucleated – describes a 'compact' settlement, about the same width in most directions, built around a central point such as a road junction or river crossing.

Settlement – any place, ranging in size from a hamlet to a mega-city, where people live and work.

Settlement hierarchy – arranging settlements according to their population size.

Site – a small area of land on which the first part of a settlement was built.

Situation – the location of a settlement in relation to the wider area around it.

Sphere of influence – the area served by the shops and other facilities in an urban settlement. Also known as the catchment area.

Threshold population – the minimum number of people needed to support a facility or service.

1.6 Urban settlements

Brownfield site – a site of derelict or disused land in an urban area.

Central Business District (CBD) – the central and most accessible zone within a large settlement, which has many offices, large shops and public buildings.

Commute – to travel from home to a place of work on a regular basis.

Congestion charges – a charge imposed on vehicles entering a central urban zone to reduce its traffic congestion and level of air pollution.

Greenfield site – a site which has not previously been built on.

Infrastructure – the network of services needed for industry and services to run efficiently – transport, communications, energy supplies, water and sanitation systems.

Land use zones – urban areas which have different functions and characteristics to other nearby areas.

Pollution – what happens when the environment is harmed; its four types are air, noise, visual and water pollution.

Quality of life – an indicator of how people assess their lifestyle based on criteria which include GDP per capita and life expectancy.

Rapid transit systems – a transport network, such as an underground railway, designed to carry large numbers of people within an urban area.

Redevelopment – raising housing standards by demolishing and then replacing existing accommodation.

Rural–urban fringe – this zone is found at the edge of an urban area where the city meets the rural area.

Smog – air pollution due to a combination of smoke and fog.

Squatter settlement – an area of poorly built, low-cost housing on land not owned or rented by its inhabitants.

Urbanisation – an increase in the percentage of people living in urban areas.

Urban sprawl – the outward growth of a built-up area into nearby rural areas.

1.7 Urbanisation

Informal labour – employment that has no set hours or employment benefits; its low, irregular earnings are not taxed.

Over-population – when a country does not have the resources to give all its people an adequate standard of living.

Pull factors – factors encouraging people to move to an area.

Push factors – factors encouraging people to move from an area.

Self-help scheme – a way of raising housing conditions for squatters by providing them with some land and the basic materials needed to build and improve their own homes.

Site and service scheme – a way of raising housing conditions for squatters by providing them with basic accommodation and facilities such as water supply and sewage disposal.

Sustainable – something that can be used on a long-term basis with very little effect on the environment.

Urbanisation – an increase in the percentage of people living in urban areas.

2.1 Earthquakes and volcanoes

Conservative – an area where two plates slide past each other.

Constructive – where two plates move away from each other.

Convection currents – the mantle is heated by the core. This heat is transferred by convection currents. As the bottom of the mantle is heated it rises to the top, it then cools and sinks again to the bottom.

Crater – a bowl-shaped depression with steep sides formed by a volcanic eruption.

Crust – the top layer of the Earth; it can be either continental (with land on top) or oceanic.

Destructive – where an oceanic plate slides under a continental plate.

Epicentre – point on the Earth's surface directly above where an earthquake occurs.

Focus – the point within the Earth's crust where an earthquake originates.

Inner core – the centre of the Earth and the hottest part of the planet. It is a solid ball of iron and nickel and with temperatures of around 5400°C.

Lava – hot, molten rock which is erupted from a volcano.

Magma – liquid rock found beneath the Earth's crust.

Magma chamber – a reservoir of magma in the Earth's crust found beneath a volcano.

Main vent – this is the main way in which magma escapes from a volcano.

Mantle – the part of the Earth between the core and the crust.

Outer core – a liquid layer composed of iron and nickel which lies outside the inner core.

Plate boundaries – also known as plate margins, these are the edges of tectonic plates.

Pyroclastic flow – flow of materials such as ash ejected during a volcanic eruption.

Seismic waves – a wave which passes through the Earth as a result of an earthquake.

Shield volcano – a large, gently-sloping volcano formed from thin, runny lava and frequent gentle eruptions.

Strato volcano – also known as a composite volcano, made up of alternate ash and lava layers. Strato volcanoes often have very violent eruptions.

Subduction zone – where oceanic crust is forced under continental crust.

Tectonic plates – the Earth's crust, which is divided into large pieces, called plates.

2.2 Rivers

Attrition – when boulders and large stones carried by the river bash into each other and break up into smaller pieces.

Corrasion – when sand and stones carried by the river rub against the bank and bed and knock off other particles.

Corrosion – when acids in the river dissolve the rocks that make up the bank and bed.

Delta – the area where silt is deposited as a river enters the sea (or a lake).

Drainage basin – the area of land drained by a river.

Evaporation – the change of state from water droplets (liquid) to water vapour (gas) caused by heating.

Groundwater flow – underground water supplies.

Hydraulic action – when the force of the water knocks particles off the sides (banks) and the bed of the river.

Infiltration – the downward movement of water into the soil.

Interception – precipitation falling into the drainage basin can be intercepted by the leaves of trees and by ground vegetation.

Load – all the material carried by a river.

Overland flow – some of the precipitation reaching the ground flows over the surface until it reaches a river channel.

Throughflow – infiltrating water continues down slopes through the soil towards the river channel.

2.3 Coasts

Backwash – the movement of water back down a beach towards the sea.

Bay – indentation in the coastline where wave action erodes softer rock.

Beach nourishment – this is the process of putting sand from elsewhere onto an eroding beach to create a new beach or widen an existing beach. It is an example of soft engineering.

Constructive waves – low-frequency waves of low height, with a strong swash but weak backwash; the waves therefore build up material on a beach.

Coral bleaching – the whitening of coral due to expulsion or death of their symbiotic algae, usually as a result of changing environmental conditions.

Destructive waves – high-frequency, steep waves which have little swash and so move little material up a beach; however, they have strong backwash and so drag material down the beach into the sea.

Dune stabilisation – this involves planting vegetation on sand dunes so that the roots bind the sand together. This makes the dunes more resistant to erosion. This is a soft engineering technique.

Fetch – the distance across open sea or ocean over which the wind blows to create waves; the longer the fetch, the greater the possibility of large waves.

Groyne – a low wall, usually made from wood, which sticks out into the sea. It prevents longshore drift and is an example of hard engineering.

Headland – point along a coast where harder rock juts out into the sea.

Lagoon – area of salt water separated from the sea by a bar or reef.

Longshore drift – the transportation of material along a coastline.

Overfishing – when the stock of fish in the sea is depleted from too much fishing.

Polyps – tiny marine organisms that live in and build coral reefs.

Sea wall – a form of hard engineering where a wall is built to protect the coastline from erosion.

Soft engineering – this involves working with nature to try to manage the coastline.

Swash – the body of water rushing up a beach after a wave has broken.

2.4 Weather

Air pressure – the pressure at a point on the Earth's surface due to the weight of the air above that place.

Anemometer – an instrument used to measure wind speed.

Barometer – an instrument used to measure atmospheric (air) pressure.

Beaufort Scale – a scale that measures wind intensity based on observing conditions at sea.

Cloud – a cloud is a visible mass of water droplets or ice crystals suspended in the atmosphere. Clouds form when air is unable to absorb any more water – it becomes saturated. This usually happens when air cools because cooler air cannot hold as much water vapour as warm air. Therefore, condensation occurs and clouds form.

Hygrometer – an instrument used to measure relative humidity.

Maximum-minimum thermometer – an instrument used to measure both the highest and lowest temperatures within a 24-hour period.

Meteorologist – a person who is able to forecast (predict) future weather by referring to previous, similar atmospheric conditions.

Relative humidity – this describes the amount of water vapour in the air. Air contains water vapour due to evaporation and transpiration. How much water vapour it holds depends upon its temperature. Warm air can hold more water vapour than cold air.

Stevenson Screen – a wooden box on legs used to house weather recording equipment.

Sunshine recorder – records the hours of sunshine by using a glass sphere that focuses the Sun's rays to burn a track on a paper strip.

Weather – short-term, changeable, atmospheric conditions which include air temperature, cloud cover, precipitation and wind direction and speed.

Wind vane – an instrument used to indicate the direction of the wind.

2.5 Climate and natural vegetation

Altitude – the height above sea level.

Arid – dry. There is a lack of available water meaning plant growth is difficult. Desert environments are arid.

Biodiversity – the range of species within an ecosystem.

Convectional rainfall – precipitation formed by rising currents of warm, moist air.

Deforestation – the removal of tree cover in an area for farming or other activities.

Diurnal temperature range – the difference between the highest and the lowest temperature in a 24-hour period.

Greenhouse gases – gases in the atmosphere that act like a blanket and reflect heat.

Habitats – the 'home' of a plant or animal.

Insolation – solar energy which reaches the Earth's surface.

Latitude – the distance north or south of the Equator.

Leaching – the removal of nutrients and other minerals from the soil as rainwater washes the minerals downwards through the soil.

Leaf litter – dead plant material that falls to the ground, releasing nutrients as it decomposes.

Nomadic – a lifestyle that involves moving around with no permanent home.

Pastoral farmers – a type of farming which rears livestock rather than grows crops.

Radiation – the transfer of heat energy in the form of electromagnetic waves.

3.1 Development

Brazil, Russia, India and China (BRICs) – an acronym which describes four countries that are at a similar stage of development and are newly emerging economies.

Exports – the goods that a country sells overseas.

Human Development Index (HDI) – a system of ranking countries based on their GDP (gross domestic product) per capita and rates of adult literacy and life expectancy.

Indicators of development – show a country's progress economically as well as in other social aspects.

Informal sector – employment which has no set hours or employment benefits; its low, irregular earnings are not taxed.

Least Developed Countries (LDCs) – the poorest countries in the world.

Less Economically Developed Countries (LEDCs) – one of the poorer countries in the world.

More Economically Developed Countries (MEDCs) – one of the wealthier, more industrialised countries in the world.

Multiplier effect – the additional economic effects experienced when money is spread throughout a community.

Newly Industrialising Countries (NICs) – countries that are developing their economies through rapid expansion of secondary industries.

Raw materials – the things that are used to make something else.

Sustainable Development Goals (SDGs) – a set of targets produced by the United Nations in 2015 designed to reduce global poverty and improve the quality of life in many countries.

Transnational Corporation (TNC) – a very large business operating in many countries.

3.2 Food production

Agribusinesses – large companies involved in agriculture, often with many different farms.

Arable – farms which grow crops.

Calories – the unit used to measure the energy we get from food.

Commercial – farms which produce food for sale to make a profit.

Extensive – farms which have smaller inputs but usually use more land.

Inputs – the things that go into a system.

Intensive – farms that use large amounts of money, machines and technology or workers.

Irrigation – artificially diverting water to fields to grow crops.

Labour – workers.

Malnutrition – the condition that results when the body does not get enough vitamins, minerals or other nutrients.

Mixed – farms that grow crops and rear animals.

Nomad – person whose lifestyle involves moving around with no permanent home.

Outputs – the things that come out of a system.

Pastoral – farms which rear animals.

Plantations – a large area of land which has been deforested and the trees replaced with a single type of crop.

Processes – activities carried out to turn inputs into outputs.

Sedentary – settled and permanent.

Shifting cultivation – a type of rainforest agriculture which involves moving on from one plot of cultivated land to another.

Subsistence – a crop grown to feed a farmer and his/her family.

3.3 Industry

Assembly – putting things together, e.g. assembling a car from its constituent parts.

Entrepreneurship – someone who sets up a business and takes the financial risk of doing so.

Feedbacks – outputs from an industrial system that can be used as inputs, e.g. waste for recycling or as an energy source or profit which can be reinvested as capital.

Footloose – an industry that is not tied to specific location factors.

Graduates – people with a university degree.

Grants – amounts of money which can be given to businesses for specific purposes.

High-tech industries – industries concerned with the application of technology. For example, computers, telecommunications and computer gaming.

Manufacturing – to make something on a large scale using machinery.

Processing – the production of, for example, food, drink, chemicals or textiles.

Raw materials – the things that are used to make something else.

Secondary sector – industries that make products from raw materials.

Science parks – these are centres where many high-tech industries are found.

Site – a small area of land on which an industry is located.

3.4 Tourism

Adventure tourism – holidays involving physical activities such as white water rafting or sky diving.

Disposable income – income remaining after taxes, leaving money which can be spent on things such as holidays or consumer goods.

Ecotourism – a type of tourism which focuses on tourists experiencing the natural environment.

Infrastructure – the network of services needed for industry and services to run efficiently – transport, communications, energy supplies, water and sanitation systems.

Management – where people change a natural environment in order to try to make it sustainable.

Multiplier effect – the additional economic effects experienced when money is spread throughout a community.

Package holiday – a holiday organised by a travel agent, with arrangements for transport, accommodation, etc. made at an inclusive price.

Seasonal employment – jobs which are only available for part of the year. They are usually temporary, short-term and poorly paid.

Sustainable – something that can be done on a long-term basis with very little effect on the environment.

Tourism – the industry associated with people going on holiday; can be either national or international.

Westernised – to be influenced by the cultures of the west, e.g. USA and Europe.

Wilderness tours – tours to places that are uncultivated, uninhabited and inhospitable regions.

3.5 Energy

Consumption – the amount of energy which is used by a country or region.

Energy mix – the combination of different energy sources that a country or region uses.

Fossil fuels – energy resources such as oil, gas and coal.

Non-renewable energy – energy which is used once and cannot be used again.

Nuclear reactor – the part of a nuclear power plant where a controlled nuclear reaction takes place in order to release energy.

Renewable energy – sources of power that can be used over and over again.

Turbines – a rotor which is powered by water or wind to provide a continuous supply of energy.

3.6 Water

Aquifer – a layer of porous rock which stores underground water.

Basic human needs – things like food, water and shelter that people need in order to survive.

Desalinisation – removing salt from sea water so that it can be used as drinking water.

Domestic water – water used in the home.

Drip-irrigation – where small amounts of water are used to target the roots of crops.

Flood irrigation – where large amounts of water are used to grow crops. The area is simply flooded with water.

Irrigation – artificially diverting water to fields to grow crops.

Virtual water – water which is used in the process of manufacturing things but which is 'invisible' i.e. part of the process but not seen in the finished item.

Water deficit – a situation where available water supplies do not meet all the needs of local people.

3.7 Environmental risks of economic development

Acid rain – rainfall that damages the environment because it has been made acidic by pollution in the atmosphere.

Aesthetically damaging – where something does not look nice.

Contamination – when pollutants are added to the natural environment.

Decibels – how sound volume is measured.

Desertification – the process in which semi-arid environments change to become more desert-like.

Greenhouse gases – gases in the atmosphere that act like a blanket and reflect heat.

Groundwater – underground water supplies.

Gullies – channels in the soil caused by water erosion.

Soil erosion – where soil is washed away by water or blown away by the wind.

Subjective – a matter of opinion.

Toxic – poisonous.

Wilderness – an uncultivated, uninhabited and inhospitable region.

Population and settlement

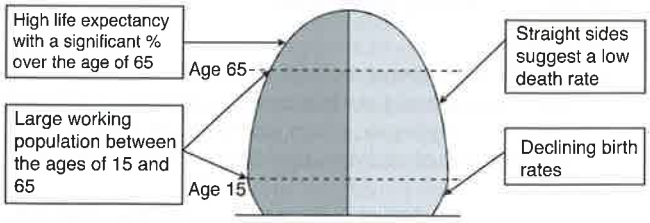
1.1 Population dynamics

1. Life expectancy, infant mortality, care of the elderly, economic
2. Over-population – when a country does not have the resources to give all of its people an adequate standard of living, e.g. Tanzania.
   Under-population – describes an area where the population is well below that which can be supported by its natural resources, e.g. Canada.
3. **Any two from:** human conflict; infant mortality rate; good sanitation; nutrition; clean water; natural disasters.
4. **Any two from:** emancipation of women; education; urbanisation; average age of marriage; culture; religion.
5. A population policy is where the government of a country imposes laws to try to control their population growth rate. An example of an anti-natalist population policy is China's one-child policy.

1.2 Migration

1. An immigrant is someone who is moving into a country. An emigrant is someone who is leaving a country.
2. A refugee is a person who is forced to move, often because of war or natural disaster.
3. **Any two from:** migrants may be employed doing menial jobs; the destination country may be able to gain skilled labour cheaply; a multi-ethnic society may increase understanding and tolerance of other cultures.
4. **Any two from:** migrants are usually healthy young men who would be capable of doing useful work at home; a gender imbalance is created with more women than men being left behind; many emigrants are educated and the population left behind are less able to build a better country; the young and the elderly are left behind, putting pressure on both the education and healthcare systems.
5. The answer will depend upon the specific case study chosen. However, the answer should include the name of the country of origin and destination as well as **two** impacts on the migrants themselves.

1.3 Population structure

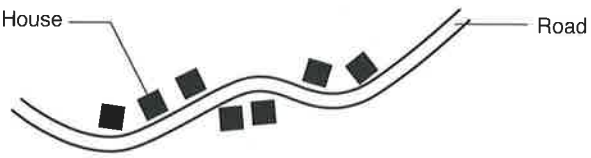
1. At stage 3, birth rates are reducing and death rates are low.
2. 

3. Age dependency is the link between the number of adult people who create wealth and the young and elderly population who depend on them for support.
4. **Any from the following:** a large and cheap workforce is created; a large population can provide a growing market, which is attractive to exporting countries; a significant tax base may be created by the large numbers of working people.
5. **Any from the following:** increase in elderly people puts a strain on healthcare services; many countries face a pensions crisis where there is not enough money to cover the pensions of an increasingly elderly population; fewer people of working age can lead to a shrinking economy and a decrease in the amount of tax being paid.

1.4 Population density and distribution

1. Population distribution is the way in which people are spread out over the Earth's land surfaces. Population density is a measure, which calculates how many people live in an area (usually 1km²) and indicates whether an area is sparsely or densely populated.
2. This may depend on the case study that has been selected for study, but expect to see references to extreme climates, mountainous terrain, soil degradation and desertification.
3. This may depend on the case study that has been selected for study, but expect to see references to flat land, fertile soil, fossil fuels, fishing, fresh water, temperate climate, mineral deposits and coastal locations.
4. The process in which semi-arid environments change to become more desert-like.
5. The process of soil becoming less fertile.

1.5 Settlements and service provision

1. 

2. The site of a settlement is the area of land on which it is first built whereas the situation is the settlement's location in relation to the wider area around it.
3. This is the minimum number of people needed to support a facility or service. For example, the threshold population for a university is 100 000 people.
4. 500 people
5. Any settlement with a population of over 500 people should be able to support a primary school. Therefore, most villages, towns, cities, conurbations and mega-cities would be able to support at least one primary school.

1.6 Urban Settlements

1. Central Business District (CBD); industrial zone; residential zone; rural–urban fringe
2. **Any two from:** dominated by housing; cheaper land; large plots with gardens and garages; population have a high quality of life and commute to work (more economically developed countries); dominated by squatter settlements; population have a low quality of life; poor housing (less economically developed countries).
3. This is what happens when the environment is harmed. There are four main types of pollution found in urban areas: air, noise, visual and water pollution.
4. **Any two from:** inequalities; traffic congestion; housing issues; conflicts over land use.
5. Answer will depend upon the problems identified.

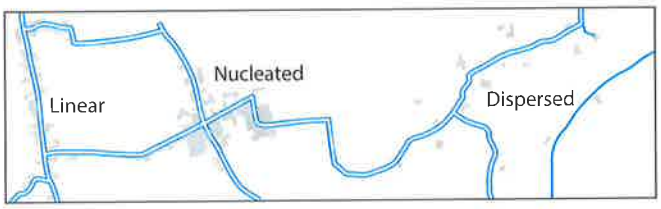
1.7 Urbanisation

1. There has been an increase in rural to urban migration in less economically developed countries.
2. **Any two from:** poor building construction; disease; risk of fire; unsuitable location; crime; lack of healthcare; lack of education; informal labour.
3. Some common examples are: Roçinha, Rio de Janeiro; Dharavi, Mumbai; 10th of Ramadan City, Cairo and Kibera, Nairobi.
4. These schemes are similar in that they both involve the authorities however, site and service schemes are on a larger scale. They also have the main infrastructure provided, e.g. water, electricity and sanitation, whereas self-help schemes are unlikely to have this.

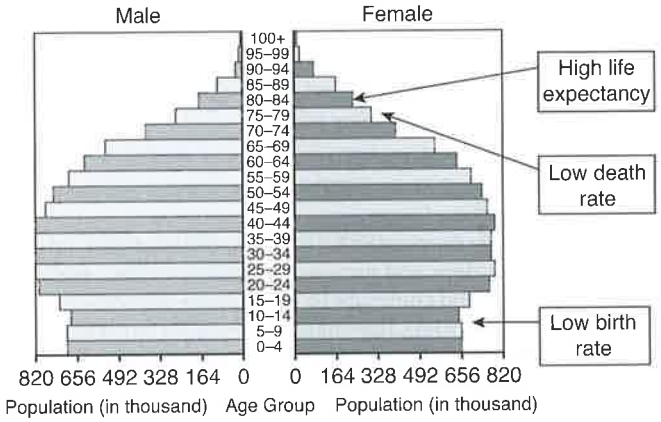
5. A range of answers could be accepted here. Examples from the Curitiba case study include: improving public transport; providing urban parks; planting trees; recycling; using renewable energy.

Exam-style questions – Theme 1

1. The east of Kenya has the lowest population density **[1]**.
2. Migration is the movement of people from one place to another **[1]**. An example of migration is international migration from Senegal to Europe **[1]**.
3. Settlements typically develop into three types: linear, dispersed, and nucleated. Linear settlements are long and narrow and tend to grow up along a road or river **[1]**. Dispersed settlements are individual farms and houses that are scattered over a rural area **[1]**. Nucleated settlements are clustered around a road junction or bridge **[1]**.



4. Population growth = birth rate – death rate +/- migration so for Kenya 26.4 – 6.89 – 0.22 = 19.29 so the population is growing by 19.29 people per 1000 per year. **[Need to show working and have the correct units for the full 3 marks.]**
5. **[2 marks available for a correctly sketched pyramid, 2 marks available for clear annotations.]**

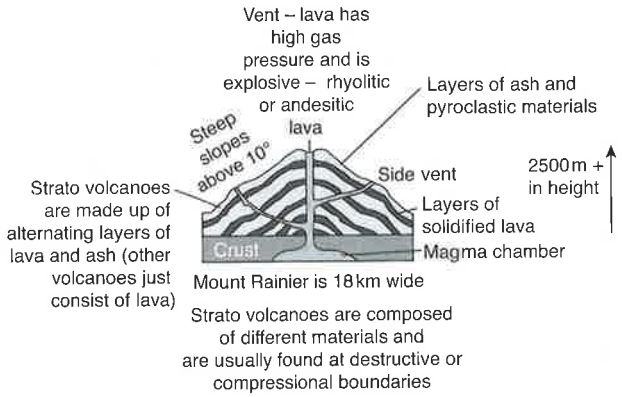


6. Problems could include: traffic congestion, squatter settlements, air and noise pollution.
   Solutions could include: pedestrianised areas, congestion charges, self-help schemes, site and service schemes, public transport. **[Five points need to be made to gain 5 marks. A balance is needed between problems and solutions. A maximum of 4 marks will be awarded if only one aspect is tackled.]**
7. Levels of marking applied to urban example:
   Level 1 (1–3 marks): Statements including limited detail that suggest characteristics of an urban area which is rapidly growing and ways in which the urban area could be made more sustainable, e.g. disease, poor building construction, risk of fire, crime, lack of services, site and service schemes, self-help schemes.
   Level 2 (4–6 marks): More developed statements that explain reasons for characteristics and ways in which the urban area could be made more sustainable, e.g. disease because sanitation is poor and people live in close proximity to each other / crime because many people are unemployed or have jobs in the informal sector, etc.
   Level 3 (7 marks): Three or more developed statements and **one named example** with at least **one** piece of place-specific detail, e.g. in Dharavi in Mumbai most of the dwellings have no water or electricity so people have to rely on others to provide what they need, etc.

The natural environment

2.1 Earthquakes and volcanoes

1.



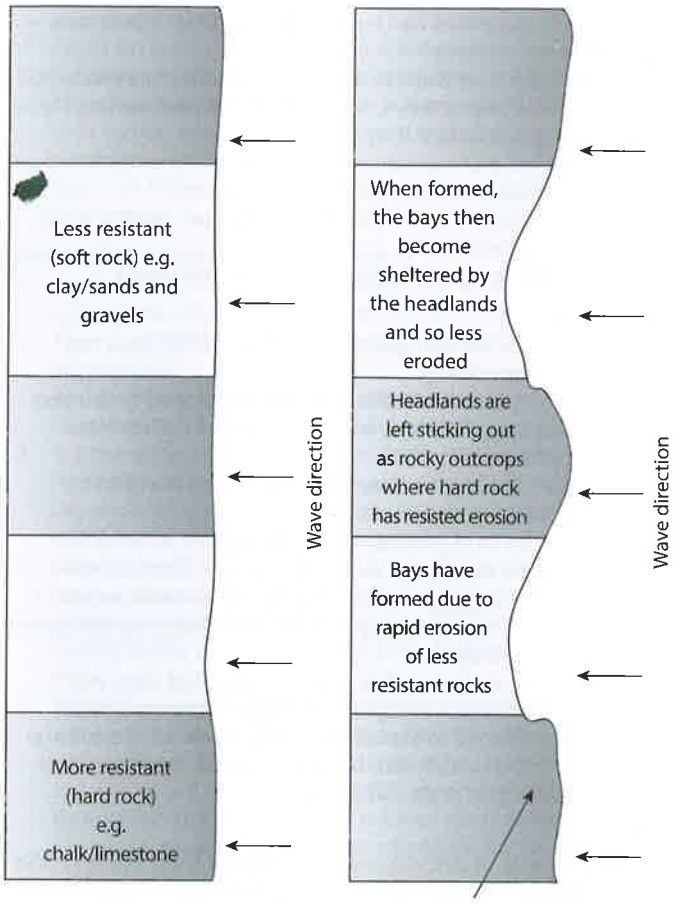
2. **Any two from:** the crust is the outer layer of the Earth; it is made up of dense but thin oceanic crust; it has thick but less dense continental crust; it is solid.
3. A constructive plate boundary is where two plates are moving apart from each other and so crust is created.
4. **Any one from:** fertile soils, which are good for farming; tourism; geothermal energy production; mineral mining.
5. Economic impacts are those which affect either money or jobs. So, an economic impact could be **any one from:** the damage caused needs to be repaired, which can cost a huge amount of money; agriculture or industry is damaged, which has knock-on effects on the economy.

2.2 Rivers

1. Overland flow is where some of the precipitation reaching the ground flows over the surface until it reaches a river channel.
2. Any two from: hydraulic action; corrasion; corrosion; attrition.
3. Either meanders or ox-bow lakes. Waterfalls would also be acceptable.
4. False. A levee is a naturally formed ridge on the edge of a river channel.
5. Opportunities could include **any one from:** tourism; industry; agriculture; power generation.
   Hazards could include **any one from:** flooding and associated damage; loss of life, etc.

2.3 Coasts

1. **The formation of headlands and bays**



2. A stump is formed when the coastline is being eroded. Firstly, destructive waves attack the headland and small cracks appear. These cracks get larger as erosion continues, firstly forming a wave-cut notch, a cave and then an arch. After a period of stormy weather, the roof of the arch may collapse leaving a stack, which is a pillar of rock separated from the coastline. A stump is a stack that has been eroded further so that it is covered by the sea during high tide.
3. Barrier reefs and atolls look similar but atolls are associated with volcanic islands and are only found around submerged oceanic islands.
4. The whitening of coral due to expulsion or death of their symbiotic algae, usually as a result of changing environmental conditions.
5. Possible examples include sea walls, groynes or any other strategies which involve building man-made structures.

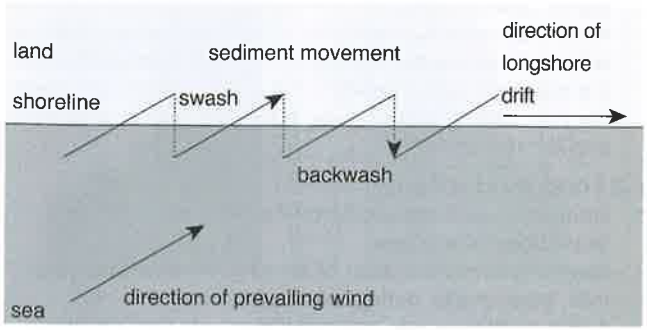
2.4 Weather

1. A wooden box on legs used to house weather-recording equipment.
2. A sunshine recorder records the hours of sunshine by using a glass sphere that focuses the Sun's rays to burn a track on a paper strip. The total length of the burn shows how long the Sun has been shining so the longer the burn, the longer the hours of sunshine.
3. A hygrometer measures relative humidity, which describes the amount of water vapour in the air.
4. An anemometer. It measures wind speed in km/hr whilst the Beaufort Scale estimates wind speed.
5. Cloud cover is measured in oktas or eighths

2.5 Climate and natural vegetation

1. The climate in the tropical rainforest consists of warm temperatures (usually 28°C all year round) and high rainfall (often more than 2000mm per year). There are no distinct seasons and rainfall is convectional.
2. Leaching is the removal of nutrients and other minerals from the soil as rainwater washes the minerals downwards through the soil.
3. Deserts are very hot during the day, temperatures are usually around 40°C or 50°C. However, temperatures at night are very low and often fall below freezing. Deserts are very arid, meaning that they are very dry, there is little rainfall.
4. Whilst the high temperatures, long hours of daylight and unbroken sunshine are all good for plant growth, rainfall is light, unreliable and unpredictable. Soils are baked hard, making infiltration difficult. This, combined with high evapotranspiration rates, means there is little water available for plant growth.
5. Any of the following would be appropriate answers:
   Dormancy – drought-resistant seeds lie dormant until a period of rainfall. These plants can complete their lifecycle within a few weeks.
   Water retention – some plants store water in stems, trunks or leaves.
   Tolerance of saline conditions – desert soils are salty because evaporation draws salt upwards towards the surface. Salt is toxic to plants but some have developed salt tolerance.

Exam-style questions – Theme 2

1. Coral bleaching is the whitening of coral due to the expulsion or death of their symbiotic algae, usually as a result of changing environmental conditions **[1]**.
2. Day 1 – 18°C; Day 2 – 13°C; Day 3 – 11°C; Day 4 – 11°C **[1 mark for every two correct answers.]**
3. At a conservative plate boundary plates are rubbing against each other **[1]**, the plates are either moving in different directions or in the same direction but at different speeds. Friction builds up as the plates move **[1]** and sometimes one of the plates jars against the other. When this pressure is released an earthquake occurs **[1]**.
4. 

   [1 mark for sketch, 1 mark for prevailing wind, 1 mark for swash and backwash labelled correctly.]
5. Hot deserts have minimal amounts of rainfall, less than 250mm per year **[1]**. Hot deserts also have temperatures which are high all year round and often exceed 40°C **[1]**. However, there is often a huge diurnal range, with temperatures reaching 40°C during the day and –40°C at night **[1]**. There is often a seasonal pattern to the desert climate with one cooler and wetter season and another hot, arid season **[1]**.

6. Named example, e.g. Montserrat – 23 deaths and over 100 injured, mass evacuation of population, which was 12 000 (1995), reduced to 1500 (2001), serious skills shortage due to migration, airport and port closed, economy based on farming, fishing and tourism destroyed, housing shortage led to 70% rent increase. **[1 mark for each point made, named example needed otherwise marks limited to a maximum of 4, also need to cover both social and economic impacts otherwise marks limited to a maximum of 4.]**
7. Levels of marking applied to river management example:
Level 1 (1–3 marks): Statements including limited detail which suggest how a river could be managed, e.g. dams and reservoirs, afforestation, levees, flood forecasting, diversionary spillways.
Level 2 (4–6 marks): More developed statements which explain how a river could be managed, e.g. afforestation involves the planting of trees so rainfall is intercepted, which delays runoff into the river, etc.
Level 3 (7 marks): Three or more developed statements and one named example with at least one piece of place-specific detail, e.g. On the Mississippi River diversionary spillways have been constructed. These are overflow channels which store excess water in times of flood and release it after the floods have passed, etc.

Economic development

3.1 Development

1. The HDI is the Human Development Index. It describes social and economic well-being. It uses adult literacy, life expectancy and GDP per capita to give a score between 0 and 1. Countries with a score close to 0 have low human development whilst countries with a score close to 1 have high human development.
2. Any service industry. For example, healthcare, education or any job involved in tourism.
3. Employment which has no set hours or employment benefits; its low, irregular earnings are not taxed.
4. Most TNCs are based in MEDCs such as the USA and the UK. Unilever, McDonalds and Apple are all examples of TNCs.
5. **Any one from:** TNCs invest in countries by developing the local infrastructure and creating jobs; TNCs usually pay higher wages than local businesses. Employees therefore have a higher quality of life; TNCs bring wealth to the local economy, which has a positive multiplier effect; local people learn new skills and use new technologies; most manufactured products are exported, which benefits the economy; TNCs pay tax to the host country – this can be invested in health, education and infrastructure.

3.2 Food production

1. Farms that use large amounts of money, machines and technology or workers.
2. Anything which is a result of farming. For example, wool, milk, eggs, maize, barley, waste or money.
3. A disease that people may get if there are food shortages and they are malnourished. Symptoms include the stomach swelling, skin peeling and hair turning orange.
4. Crops that are genetically modified. This means the altering of crops to withstand pests and diseases. GM crops have the potential to increase the amount of food that can be grown. However, some countries have banned GM crops until they are proved safe for people and the environment.
5. Giving aid makes people dependent on the food packages being handed out. Aid does not provide a long-term solution to food shortages.

3.3 Industry

1. These are things that can be returned as inputs so, for example, waste that can be recycled or used as a source of energy or capital that can be used to buy other inputs such as electrical components.
2. Entrepreneurs may want to site their industries in a place that means something to them, for example the place where they live or the place where they were born.
3. Raw materials and a power supply were traditionally the most important factors affecting industrial location.
4. An industry that is not tied to specific location factors, it can be located anywhere.
5. A centre where many high-tech industries are found.

3.4 Tourism

1. The number of tourists globally over the last 50 years has increased dramatically.
2. A variety may be acceptable. Answers mentioned in the text include: package holidays, adventure tourism, wilderness holidays and ecotourism.
3. Income remaining after taxes, leaving money that can be spent on things such as holidays.
4. People will be paid and have a job during the summer but not have a job or be paid during the winter. This can make it difficult to budget and survive during the closed season. If people do not have a steady income, then they may not spend money in the local area.
5. A variety may be acceptable and it is likely that they will be linked to the case study. An example would be: posters could be produced to explain to tourists some of the cultural customs. This is sustainable because it means that it reduces conflict between locals and tourists.

3.5 Energy

1. Countries with active volcanoes use energy from heated rocks and magma. In Iceland geothermal power stations produce a quarter of the country's electricity and 90% of heating and hot water.
2. Oil (36%)
3. Energy consumption has increased dramatically as population has increased and our use of gadgets which use energy has also increased.
4. The technology to develop nuclear power is expensive and so it is not really available to poorer countries. Also there have been concerns over the safety of nuclear power because of high-profile nuclear power disasters such as Chernobyl.
5. HEP can slow river flow rates. This can lead to a build-up of sediment, which can affect conditions for wildlife.

3.6 Water

1. An aquifer is a layer of porous rock which stores underground water.
2. Whilst there are exceptions, LEDCs tend to use most of their water for agriculture or in the home.
3. Any country that is shaded in the 30–69% area of the map is likely to face a water deficit as a large proportion of the population do not have access to clean water. This includes countries in sub-Saharan Africa and countries such as Madagascar and Kenya.
4. Domestic water is water that is used in the home.
5. There are a number of answers to this question. Suggestions should demonstrate that they are sustainable and conserve water, for example drip-irrigation, which uses a small amount of water and targets the roots of the plants.

3.7 Environmental risks of economic development

1. Gullies are channels in the soil caused by water erosion.
2. If noise pollution is sustained over a long time or very loud, it can cause hearing loss.
3. Acid rain is rainfall that damages the environment because it has been made acidic by pollution in the atmosphere.
4. Recycling is sustainable because it turns waste into something that can be used again. This means that raw materials are not used up.
5. National Parks are usually areas of wilderness that are protected.

Exam-style questions – Theme 3

1. Agribusiness is where large companies are involved in agriculture, often owning many different farms **[1]**.
2. The number of tourists has grown dramatically over the last 50 years **[1]**.
   For example, in 1960 there were approximately 50 million tourists – this had risen to 1 billion tourists by 2010 **[1]**.
3. Science parks usually have close links with universities, large amounts of capital to buy land and build specialist laboratories and super-fast internet connections. **[1 mark per point, up to a maximum of 3 marks.]**
4. Some areas of the world such as Somalia in eastern Africa have a water deficit **[1]**. This is partly because this is an arid area and precipitation levels are low **[1]** but also because storing water and moving it to areas that need it is expensive **[1]**.
5. There are many ways in which economic activity may pose a threat to natural environments. For example, because the vast ice sheet which covers Greenland has started to melt it is easier to access the huge wealth of mineral deposits that lie beneath the ice sheet. The price of various metals has also increased, making it even more attractive for companies to open mines in Greenland. The impact of agriculture, transport and deforestation on natural environments could also be discussed. **[1 mark per point, up to a maximum of 4 marks.]**
6. The benefits of nuclear power are that the amount of raw material needed is very small compared with other fuels such as coal or oil. Also, nuclear power contributes relatively little to acid rain, global warming and climate change. Many people have concerns over the safety of nuclear power, yet there is a lot of research being carried out to address these concerns and many measures have been taken to make sure it is as safe as possible. Importantly, nuclear power allows countries to reduce their dependence on fossil fuels and to cut imports of these resources.
   [1 mark per point, up to a maximum of 4 marks.]
7. Levels of marking applied to an example of a TNC:
   Level 1 (1–3 marks): Statements including limited detail which suggest the advantages and disadvantages of TNCs, e.g. TNCs build factories and create jobs, they create a multiplier effect and provide higher incomes.
   Level 2 (4–6 marks): More developed statements which explain the advantages and disadvantages of TNCs, e.g. TNCs create jobs for local populations who may previously have been unemployed. These employees usually receive higher wages than local businesses, which means that they have a higher income and a better standard of living, etc.
   Level 3 (7 marks): Three or more developed statements and **one named example** with at least **one** piece of place-specific detail, e.g. Nike is a TNC which makes sporting clothing and equipment. In 2010, 20 000 workers in Nike shoe factories went on strike for higher pay and in 2008 there were demonstrations in Indonesia when Nike decided to stop production in local factories and relocate, etc.

Geographical skills questions

1a. Correct and accurate completion of population pyramid.
[1 mark per correct bar.]

Total New Zealand population, 2006

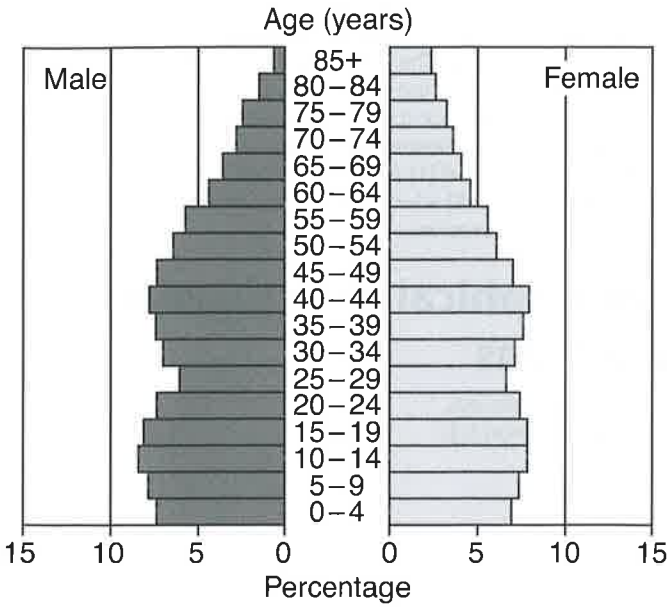


Fig. 5

Maori population, 2006

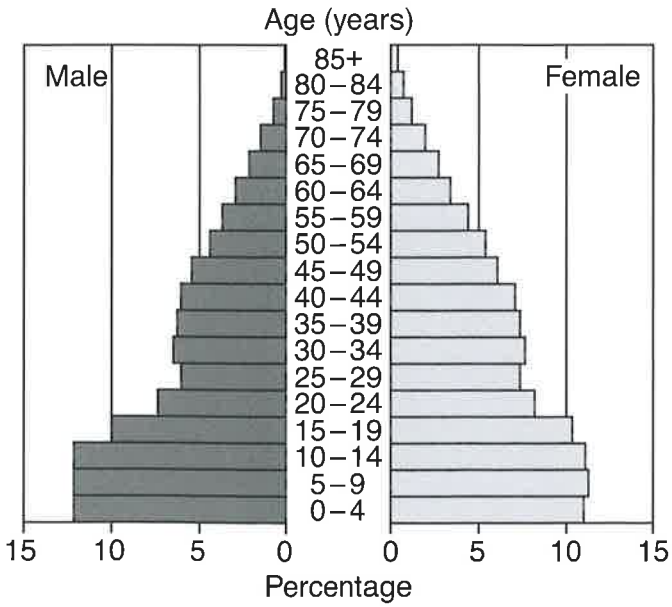


Fig. 6

Answers

6. 1b i. greater **[1 mark]**
1b ii. less **[1 mark]**
1b iii. less **[1 mark]**
1c i. The proportion of Maoris in the New Zealand population is likely to increase **[1]**.
1c ii. The Maori population pyramid is youthful and shows a rapidly growing population **[1]** with a high birth rate and a relatively low death rate **[1]**.

7. 2a. The relief in the area is steep **[1]** and made up of a number of undulating hills **[1]**. The land seems to be high **[1]** however, trees can be seen on the highest land and so is not so high that temperatures are too cold for trees to survive **[1]**. **[1 mark per point up to a maximum of 4 marks.]**
2b. On the highest land **[1]** and in valleys **[1]**.
2c. The steep slopes **[1]** which have been deforested **[1]** may encourage soil erosion.

Geographical investigations questions

1. Answer B is correct.
2. Answer A is correct.

E

3
1.

2.

3

4

5

3
1

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3

4

5

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