



2016 specification
first exams in 2018

GCSE Geography Emergency Cover Lessons

Volume 1

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Teacher's Introduction

As a former Geography teacher and Head of Humanities for many years, I know the value of a ready-to-go resource for GCSE cover lessons! This resource is designed as a 'dip-in', with lessons spread across eight key themes of geography: Hazards, Climate, Ecosystems and UK Landscapes (for the physical elements), and Urbanisation, Development, the UK, and Natural Resources (to cover the human aspects).

A lot of the time, cover lessons unfortunately come down to a revision guide, and the instruction to 'make notes' then answer questions. While revision guides have good diagrammatic information, they don't provide sufficient depth or include any extension, and students know that often no one will find time to mark the work they are doing. With this resource, however, the marking and feedback cycle could be completed within the lesson, while any additional activities can be set for homework.

The resource provides meaningful and stimulating learning during periods of cover, allowing students to apply their knowledge and practise key skills while progressing within the topic area they are studying. For a teacher, being able to decide at the last minute the lesson to be studied – and knowing that their class is on-task during an unplanned absence – is a godsend!

This resource is one part of a set of four volumes which are available in this Emergency Cover Lessons range for GCSE Geography. The full index of lessons for all four volumes is given on the following pages, cross-referencing each lesson to the exam board specifications for which it is suitable. The content within this volume is presented distinctly from that of the others.

Each volume contains lessons in every theme. Broadly, each volume builds upon the foundations and content in previous volumes. With this structure, Volume 1 is perfect for providing cover early on in a topic teaching block, or as consolidation of the basics at a later stage in the topic. Lessons in Volume 4 might be more suitable towards the end of a block of teaching, or to stretch and challenge students in a top set!

The lessons in all volumes have been designed for non-specialist use and independent student study, allowing any cover teacher the opportunity to photocopy the relevant sheets, distribute these to the class, and offer minimal support throughout the lesson. A specialist Geography teacher may, of course, decide to be more hands-on with the delivery of the lesson.

I hope you find this resource, and indeed the full set of volumes, useful in your school!

February 2019

Free Updates!

Register your email address to receive any future free updates* made to this resource or other Geography resources your school has purchased, and details of any promotions for your subject.

* resulting from minor specification changes, suggestions from teachers and peer reviews, or occasional errors reported by customers

Go to [zzed.uk/freeupdates](https://www.zzed.uk/freeupdates)

Lesson Index by Volume/Specification – Physical Geography

Lessons	Volume	AQA	Edexcel A	Edexcel B	OCR A
Theme 1: Natural Hazards					
What causes extreme weather? (I)	1	✓	✓	✓	✓
What causes extreme weather? (II)	1	✓	✓	✓	✓
Tropical storms: Formation & Distribution (I)	2	✓	✓	✓	✓
Tropical storms: Formation & Distribution (II)	2	✓	✓	✓	✓
Tropical storms: Impacts & Mitigation (I)	3	✓	✓	✓	✓
Tropical storms: Impacts & Mitigation (II)	3	✓	✓	✓	✓
Extreme weather in the UK (I)	4	✓	✓	✓	✓
Extreme weather in the UK (II)	4	✓	✓	✓	✓
Tectonics: Earth structure and processes (I)	1	✓		✓	
Tectonics: Earth structure and processes (II)	2	✓		✓	
Impacts of earthquakes	3	✓		✓	
Mitigation and prediction of earthquakes	4	✓		✓	
Impacts of volcanoes	3	✓		✓	
Mitigation and prediction of volcanic eruptions	4	✓		✓	
Theme 2: Climate Change					
Natural climate change: Patterns, causes, evidence	1	✓	✓	✓	✓
Human causes of climate change	2	✓	✓	✓	✓
Impacts of climate change	3	✓	✓	✓	✓
Mitigation and adaptations for climate change	4	✓	✓	✓	✓
Theme 3: Ecosystems					
What are ecosystems and biomes? (I)	1	✓	✓	✓	✓
What are ecosystems and biomes? (II)	1	✓	✓	✓	✓
Tropical Rainforest: Structure & characteristics	2	✓	✓	✓	✓
Tropical Rainforests: Deforestation	3	✓	✓	✓	✓
Tropical Rainforests: Sustainable management	4	✓	✓	✓	✓
Theme 4: UK Physical landscapes					
Coastal processes (I)	1	✓	✓	✓	✓
Coastal processes (II)	2	✓	✓	✓	✓
Coastal landforms	3	✓	✓	✓	✓
Human activity and management of coasts	4	✓	✓	✓	✓
River processes	1	✓	✓	✓	✓
River landforms	2	✓	✓	✓	✓
Human activity and management of rivers (I)	3	✓	✓	✓	✓
Human activity and management of rivers (II)	4	✓	✓	✓	✓
Glacial processes and landforms	1	✓	✓		
Human activities in glaciated landscapes	2	✓	✓		

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Lesson Index by Volume/Specification – Human Geography

Lessons	Volume	AQA	Edexcel A	Edexcel B	OCR A
Theme 5: Urbanisation					
What is urbanisation?	1	✓	✓	✓	✓
Megacities	2	✓	✓	✓	✓
Lagos: A case study	2	✓	✓	✓	✓
How cities change	3	✓	✓	✓	✓
UK Regeneration: A case study	3	✓	✓	✓	✓
Sustainable living in cities	4	✓	✓	✓	✓
Liuzhou Forest City	4	✓	✓	✓	✓
Theme 6: Development					
What is development?	1	✓	✓	✓	✓
How is development measured?	1	✓	✓	✓	✓
Development theories	2	✓	✓	✓	✓
Uneven development	2	✓	✓	✓	✓
Globalisation and trade (I)	3	✓	✓	✓	✓
Globalisation and trade (II)	3	✓	✓	✓	✓
Development strategies and aid (I)	4	✓	✓	✓	✓
Development strategies and aid (II)	4	✓	✓	✓	✓
Theme 7: The UK					
Physical distinctions of the UK (I)	1	✓	✓	✓	✓
Physical distinctions of the UK (II)	1	✓	✓	✓	✓
Population change & demographics in the UK	2	✓	✓	✓	✓
Migration in the UK	2	✓	✓	✓	✓
Employment change in the UK	3	✓	✓	✓	✓
UK & the wider world (I)	4	✓	✓	✓	✓
UK & the wider world (II)	4	✓	✓	✓	✓
Theme 8: Natural Resources					
What are natural resources? (I)	1	✓	✓	✓	✓
What are natural resources? (II)	2	✓	✓	✓	✓
Food (I)	3	✓			
Food (II)	4	✓			
Energy (I)	3	✓	✓	✓	✓
Energy (II)	4	✓	✓	✓	✓
Water (I)	3	✓	✓		
Water (II)	4	✓	✓		

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- **Vol 1:** ZZBR/9203 – 15 Lessons
- **Vol 2:** ZZBR/9204 – 15 Lessons
- **Vol 3:** ZZBR/9539 – 16 Lessons
- **Vol 4:** ZZBR/9540 – 17 Lessons



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What causes extreme weather? (I

	Description
Task 1	Students label the atmospheric circulation model
Task 2	Students label a map with features relating to climate

In this lesson you will:

- ✓ label the atmospheric circulation model using the descriptions
- ✓ label a map with climatic features

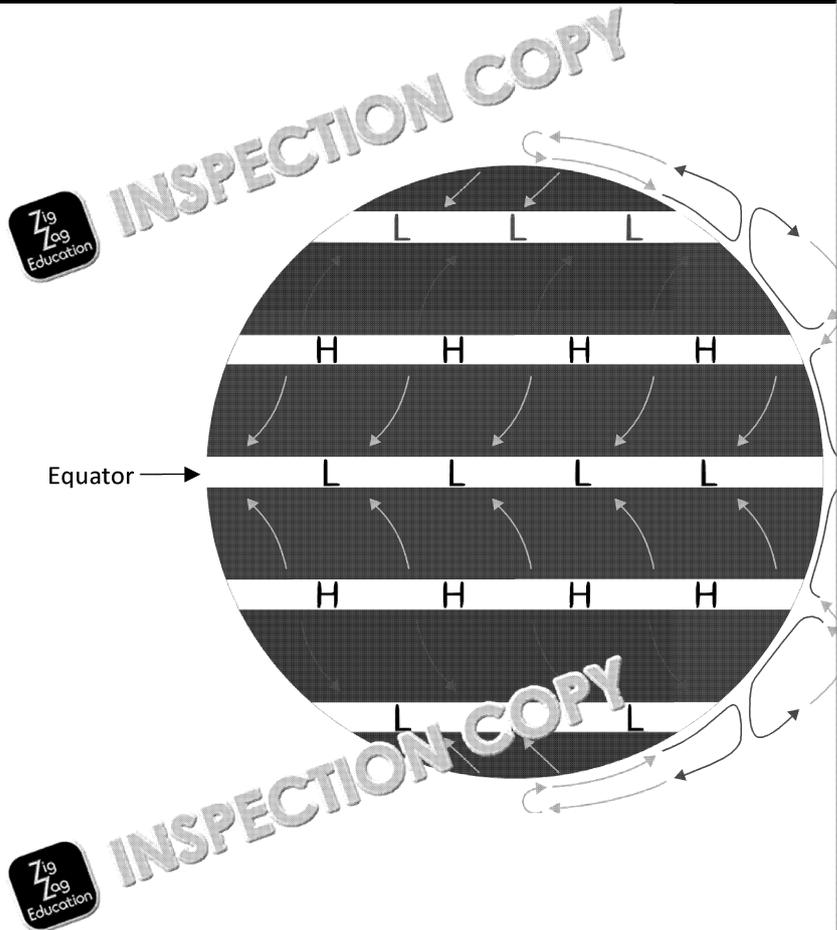


Task 1

There are three atmospheric circulation cells.

Read the descriptions and label the image below with the three cells.

Ferrel cells	Hadley cells	
Surface winds blow towards the poles and are deflected due to the Coriolis effect. Air rises at around 60° latitude, and returns towards the equator aloft. However, at around 30°, air descends, causing high pressure.	These occur from the equator to around 30°. Air rises at the equator, flowing towards the poles aloft and creating thunderstorms. Trade winds blow towards the equator at the surface.	These form towards level

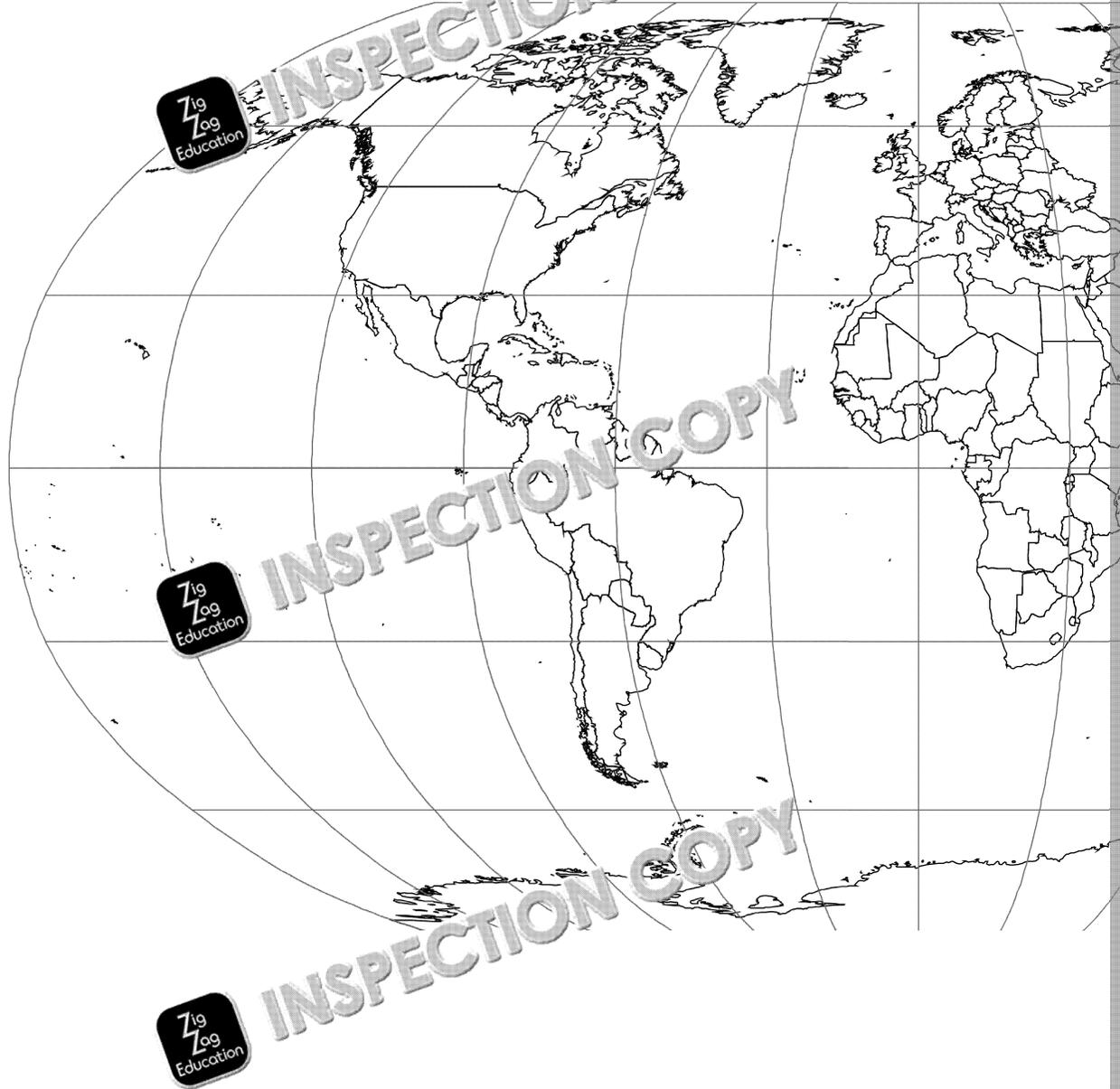


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Task 2 - Map Handout



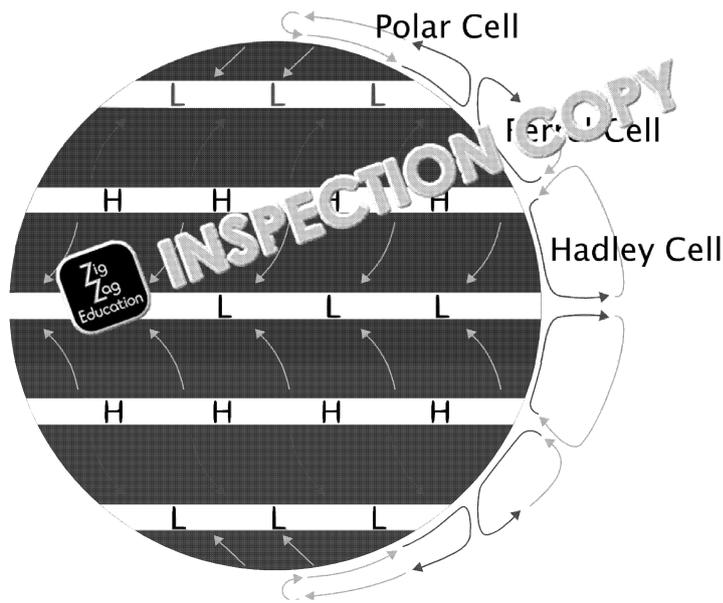
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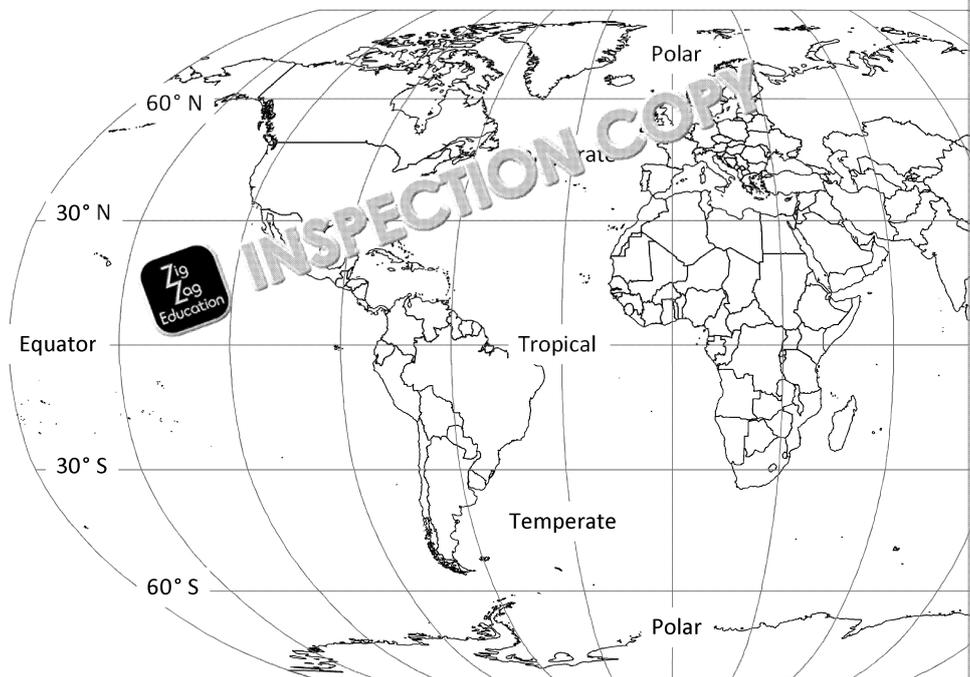


What causes extreme weather? (I) Answers

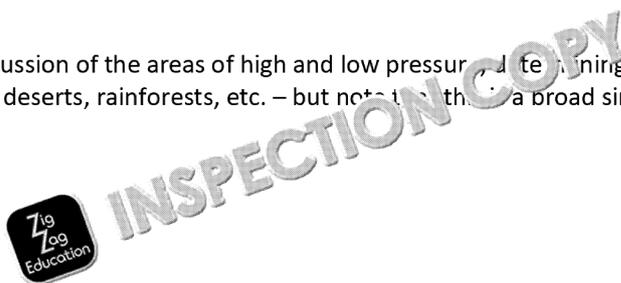
Task 1



Task 2



Allow a discussion of the areas of high and low pressure and the defining climate characteristics – e.g. deserts, rainforests, etc. – but note that this is a broad simplification.



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What causes extreme weather? (II)

	Description
Task 1	Students interpret climate graphs
Task 2	Students label a map with ocean currents

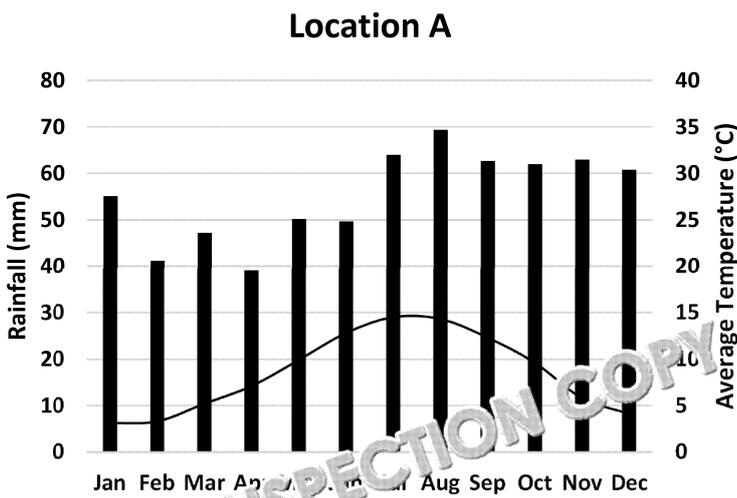
In this lesson you will:

- ✓ interpret climate graphs
- ✓ label ocean currents on a map and explain how the oceans transfer heat around the world

Task 1

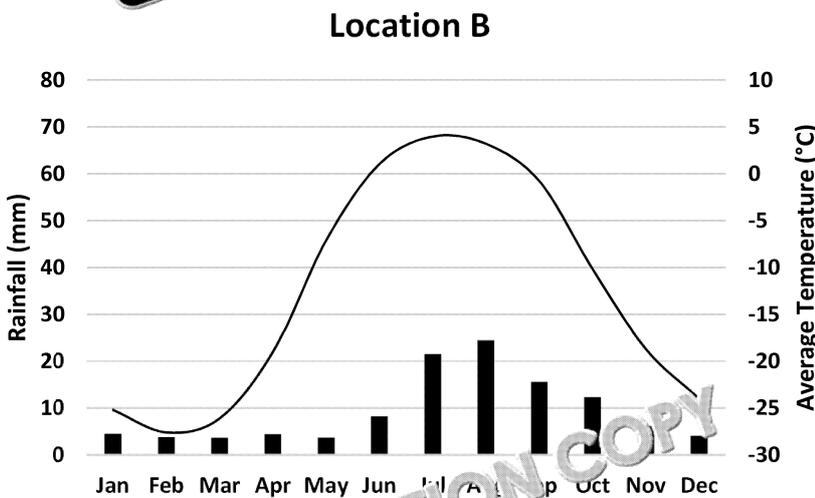
In this task, you will describe and interpret climate graphs. The first one has been completed for you. Complete the worksheet for the remaining graphs, and complete the graph for Location C.

Graph A



Trends on the graph:
 The rainfall is highest in the winter months, ranging from 38 mm each month to 70 mm each month. The lowest rainfall in the year is 38 mm in April, with the lowest average temperature of 5°C (average of 14°C in January – and 10°C in December).
Likely vegetation: deciduous woodlands
Likely high or low pressure: high pressure
Suggested country/region: Northern Hemisphere
Reason(s) for the rainfall through the year:

Graph B



Identify the climate type:

Likely vegetation:

Likely high or low pressure:

Suggested country/region:

Suggest reason(s) for the location:

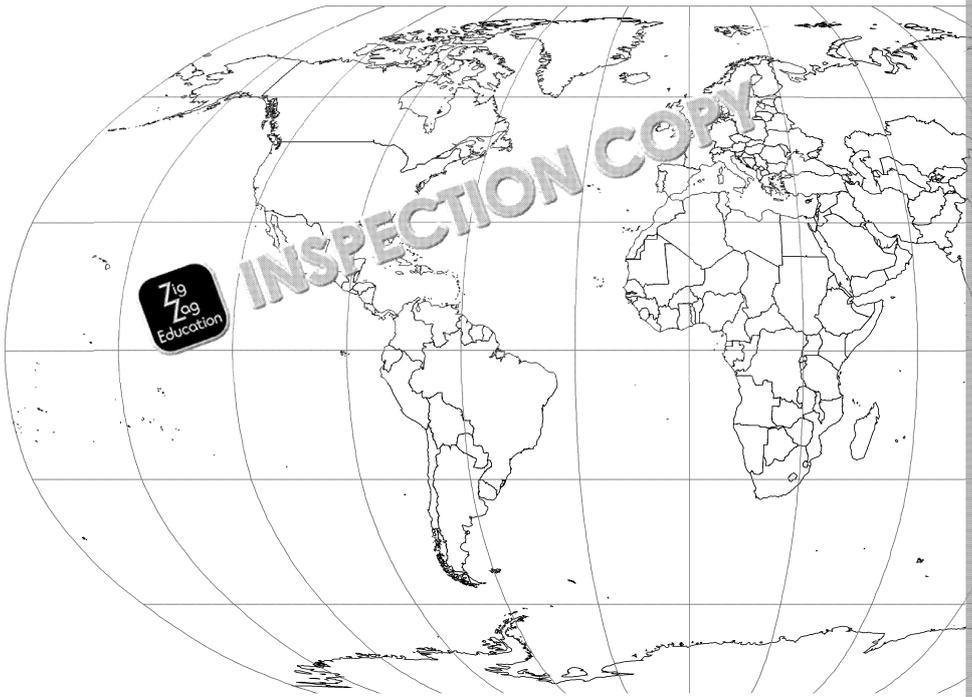
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Task 2

Draw on the map some of the major ocean currents.



Now explain how ocean currents transfer heat around the world.

.....

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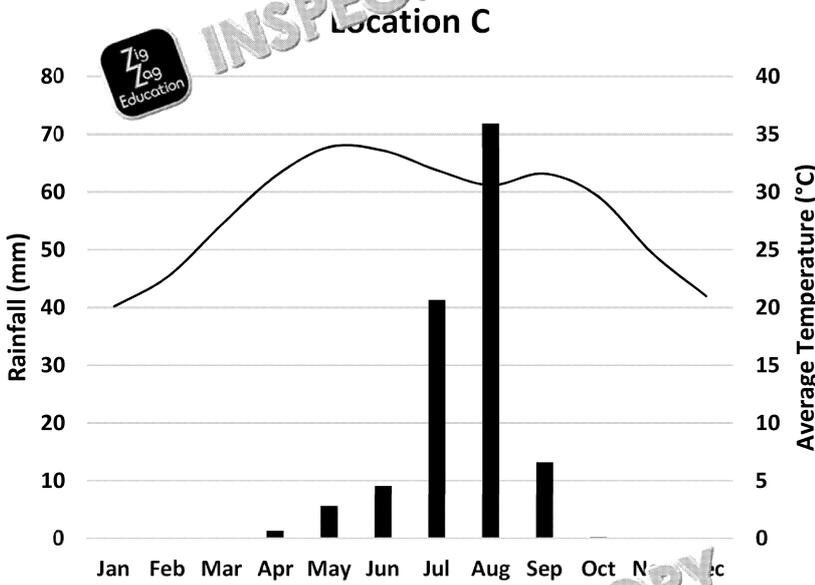


What causes extreme weather? (I) answers

Task 1

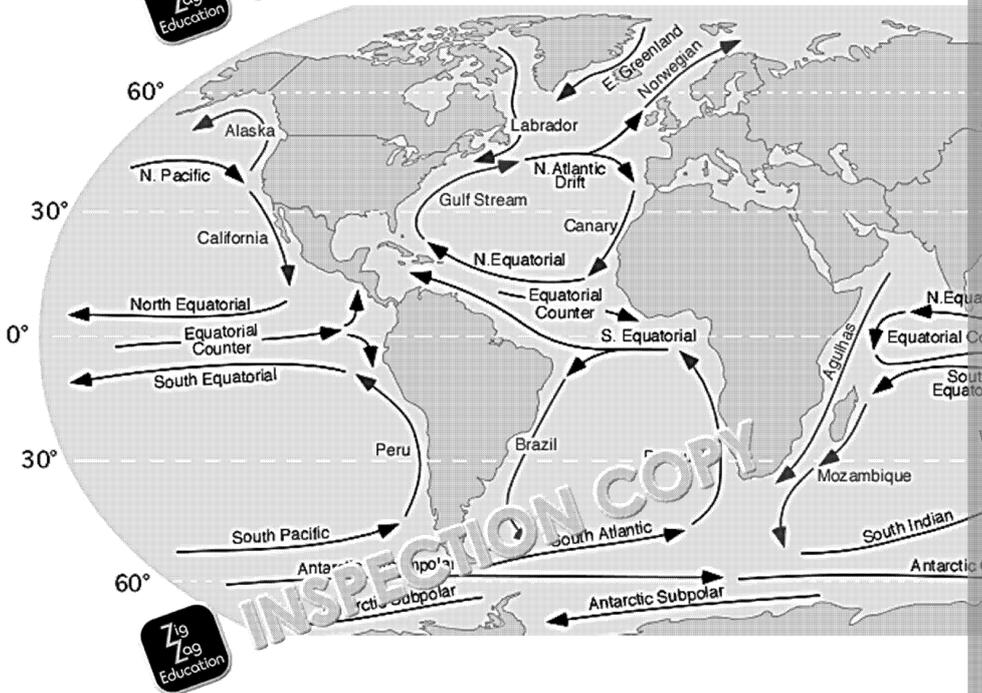
Location B is Barrow in Northern Alaska. Low rainfall indicates high-pressure 'cold desert'; vegetation is likely to be tundra.

Location C is Agadez, Niger. Low rainfall and high temperature indicate clear skies and high (any) is likely to be scrub; the location is likely to have a rainy season implies some dist



Location D is Mbandaka, Democratic Republic of Congo. The tiny annual variation in temperature (less than 2 °C throughout the year) indicates that the location is on the equator! Vegetation is

Task 2



Allow reference to distribution of heat from the equator to the poles, sinking and upwelling of water, and the effect of currents / proximity to the sea on climate, e.g. the UK is warm for its latitude

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Tectonics: Earth structure and processes

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	Description
Task 1	Students match descriptions of the Earth's layers to a diagram
Task 2	Students fill in the gaps in a text about plate movement
Task 3	Students piece together the tectonic plates. (Scissors will be needed)

In this lesson you will:

- ✓ match up the layers of the Earth
- ✓ recall the types of plate movement
- ✓ arrange tectonic plates



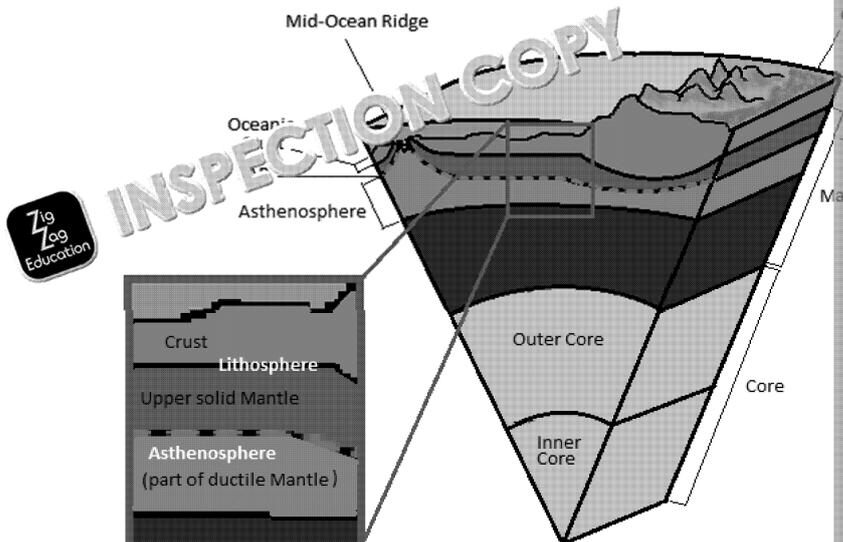
Boundary or margin?

You will sometimes see 'boundary' and 'margin' depending on your source. They mean the same thing.

Similarly, constructive = divergent; destructive = convergent; conservative = transform

Task 1

Below are some descriptions of some of the Earth's layers. Using the diagram to match the correct descriptions.



Core
Asthenosphere
Crust
Lithosphere
Mantle

Two layers – one solid – thousands of degrees – temperature increases
Solid lower layer and an upper layer can flow
Part of the mantle. Flows
Forms the plates.
The surface – land or

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Task 2

There are different theories put forward for why plates move. The following is taken from the British Geological Survey. Fill in the missing words:

'Until the 1990s, prevailing explanations about what drives plate tectonics have been _____, and most geologists believed that seafloor spreading _____ denser material convects downward and _____ because of _____, this movement of material is an essential part of convection.

'In addition to the convective forces, some geologists argue that the intrusion of magma _____ provides an additional force (called "_____") to propel and maintain plate movement. In subduction processes are considered to be secondary, a logical but largely passive force. Seafloor spreading.

'In recent years however, the tide has turned. Most scientists now favor the notion that _____ are more important than seafloor spreading. Professor _____ (Japan), a world-renowned expert in plate tectonics, concluded in his keynote address at a conference on subduction processes in June 1994 that "subduction ... plays a more important role than seafloor spreading in shaping the earth's surface features" and "running the plate tectonics gravity-controlled sink of a cold, denser oceanic slab into the subduction zone is the primary force of plate tectonics" -- dragging the rest of the plate along with it -- is now the primary force of plate tectonics'.

slab pull	cold	hotter
subduction	ridge push	convection

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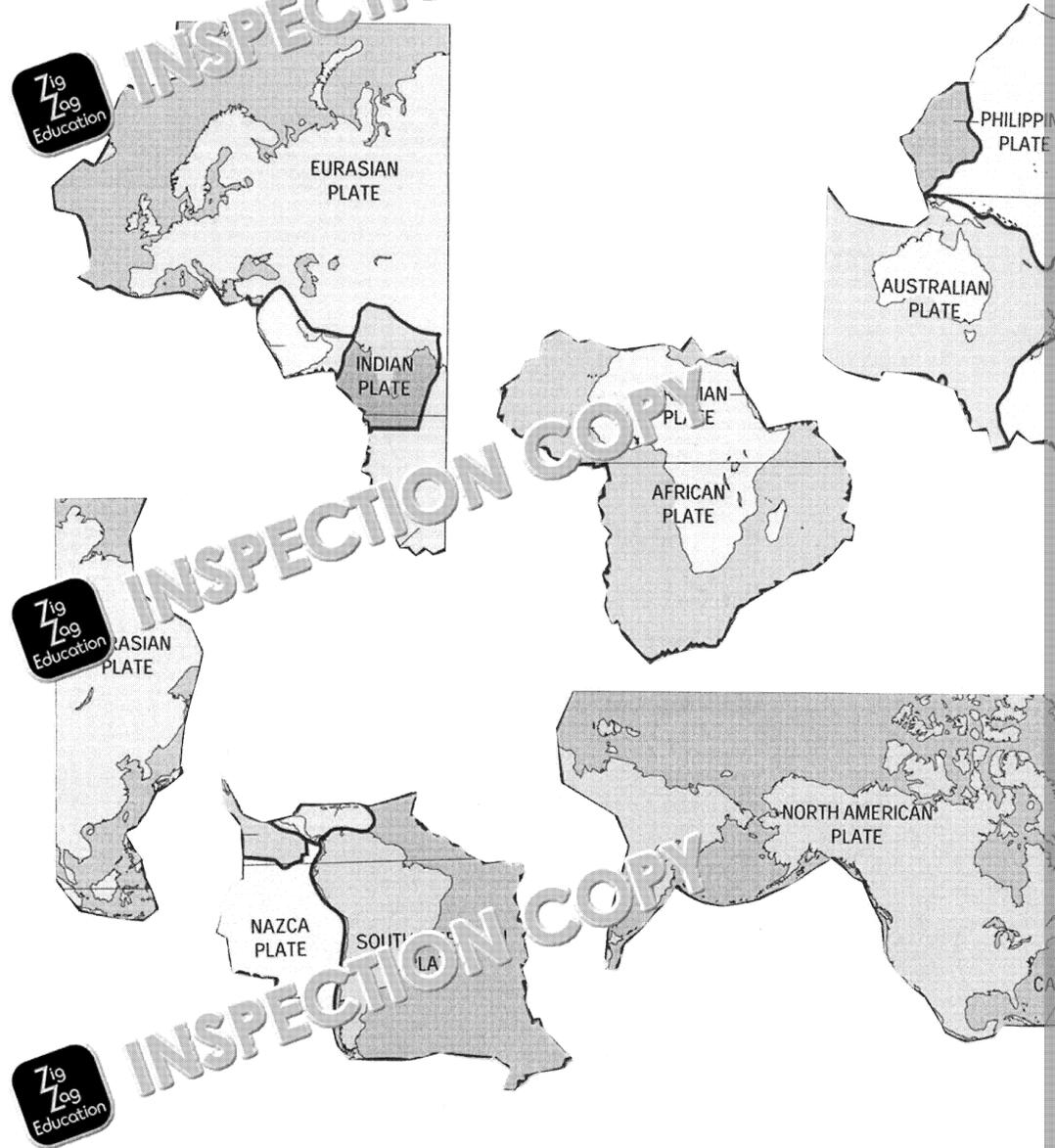
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Task 3

The Earth's surface is divided into a number of plates which fit together like a jigsaw puzzle. The map of the world is divided into these plates. Cut out the pieces of the puzzle and rearrange them to see how they fit together.



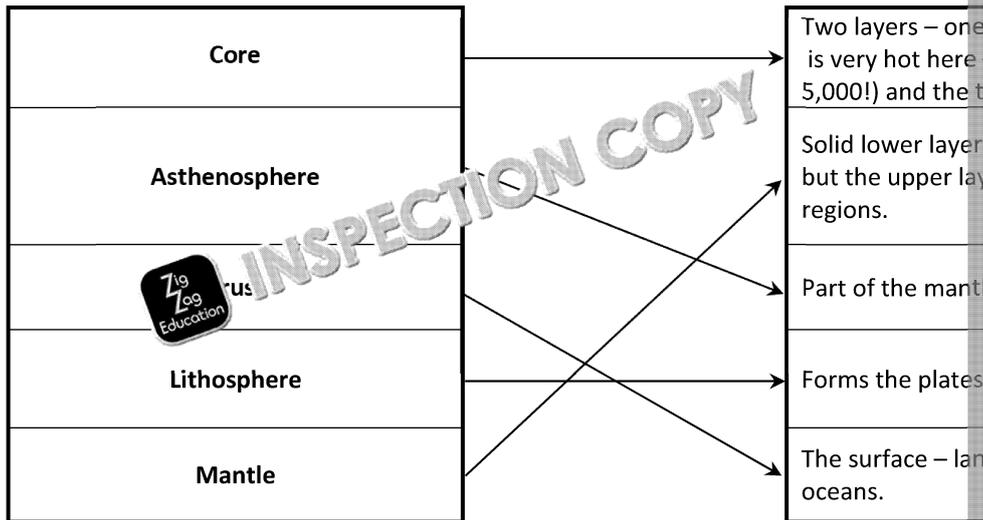
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Tectonics: Earth structure and processes (I) answers

Task 1



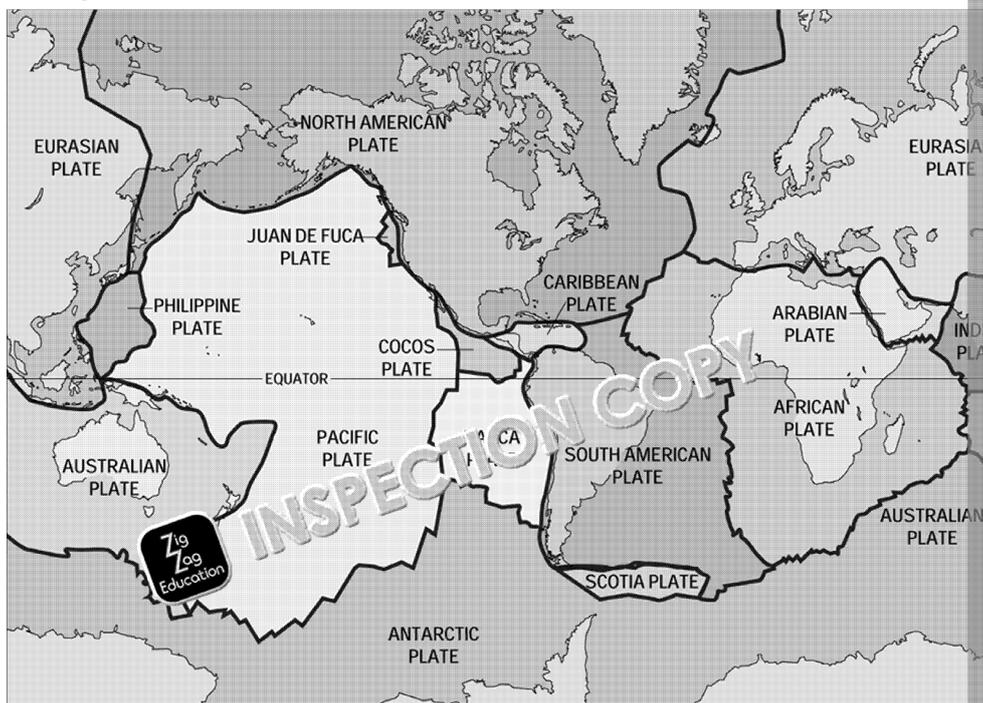
Task 2

'Until the 1990s, prevailing explanations about what drives plate tectonics have emphasized that earth scientists believed that seafloor spreading was the primary mechanism. **Cold**, dense material sinks because of gravity; this movement of material is an essential part of the process.

'In addition to the convective forces, some geologists argue that the intrusion of magma at mid-ocean ridges provides an additional force (called "**ridge push**") to propel and maintain plate movement. Thus, subduction may be secondary, a logical but largely passive consequence of seafloor spreading.

'In recent years however, the tide has turned. Many scientists now favor the notion that forces such as slab pull are more important than seafloor spreading. Professor Seiya Uyeda (Tokai University, Japan) on plate tectonics, concluded in his address at a major scientific conference on subduction that "subduction ... plays a more fundamental role than seafloor spreading in shaping the earth's plate tectonic activity". The gravity-controlled sinking of a cold, denser oceanic slab ("slab pull") – dragging the rest of the plate along with it – is now considered to be the driving force.

Task 3



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Natural climate change: Patterns, causes and

Learning objective: to know how Earth's climate has changed during the quaternary period, to know this and to be able to explain the natural causes of climate change.

Introduction to today's challenge

The world's climate is changing and this will alter the environment across Earth and in the oceans. It will change the way we live and the availability of food and water. It will alter weather patterns and cause more extreme weather events. But how do we know it is changing, and hasn't the climate always changed before?

Your teacher has been working for a top secret international geography organisation that has gathered a lot of evidence but are unable to complete their report because they are not able to find enough evidence in this file to complete their investigation. The information gathered so far shows what the climate has been like over the last 2.6 million years (we call this the quaternary period). Look for the natural causes of climate change, and report the ways in which scientists are able to conclude that the climate of the planet has always changed. If you really want to make an impression, complete your report in your own time and use them to improve your report.



Warning: You could be asked about any of this information in your examination.

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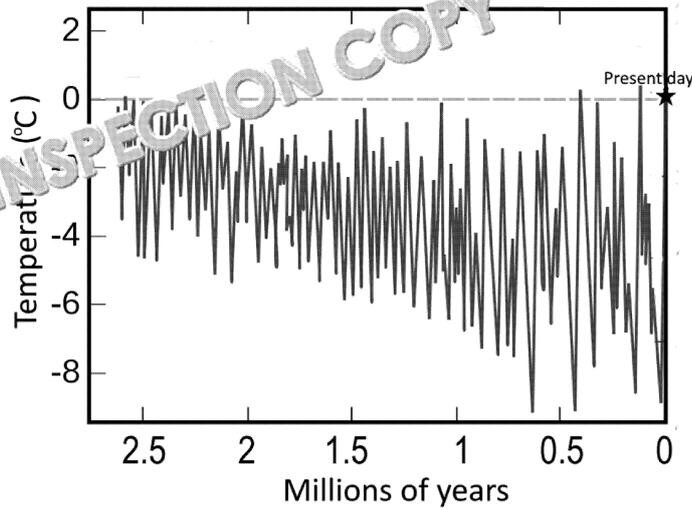
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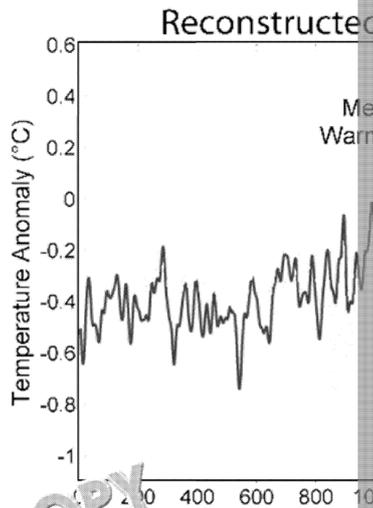
The evidence

What has happened to the world's



- Note that there is a lot of fluctuation in the Earth (between 0 and 8 degrees) over the quaternary period, but the general trend is downwards (i.e. getting colder).
- Temperatures are mostly higher than the present-day temperatures, with two exceptions: both in the last 500,000 years.

The scale of the x-axis (the one along the bottom) shows that each fluctuation is happening over hundreds of thousands of years.



Close-up on the last 2,000 years. Not what expected - small fluctuations get smoothed out when you look at the full picture. Looks as though something happened between 2000 - line seems to keep climbing to well above other recorded during this time period.

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How do they know this?!

Nobody was taking reliable measurements of the temperatures on Earth until the late nineteenth century, simply didn't have the scientific equipment! So how do we know what happened before then?

Scientists use a variety of sources - they construct an estimate of what the temperature of the planet was in a particular year, decade, century

There are other sources - need to find out

Tree rings - trees grow more when it is wet and warm. Tree rings can be used to suggest what the climate was like. Tree trunks can us take back millions of years into the past.

Deep-sea core samples - such as the data in graph 1.1. Scientists drill the seabed around the world. The types of species found tell us what the sea surface temperature was like at that place. Scientists work out the pattern of sea ice and calculate the temperature that would have allowed the ice to form.

Polar sea ice has been melting since 1979 - both average summer and winter ice coverage are decreasing as sea and atmospheric temperatures rise.

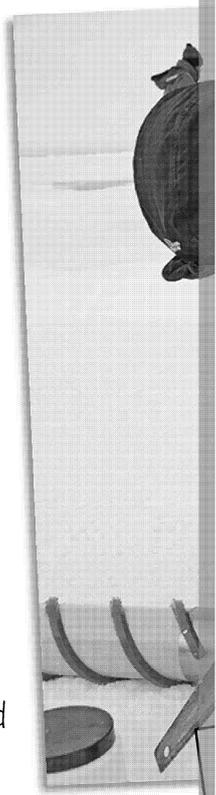
How can we be sure about that? ...
Recent ice ...
been ...
known ...
records -
same -
definitel

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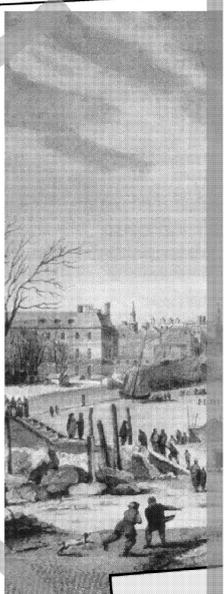
Core - ice is brilliant! It can tell us what the climate was like in the past.

Agent Amber sent this photo of a colleague cutting an ice core - she will analyse the bubbles of trapped ice in the water when she gets back to the lab. This will tell her what gases made up the atmosphere when the ice was formed and give her clues as to what was going on on Earth at that time. The more CO₂ the warmer the climate.



The ice in places such as Greenland and Antarctica has been forming for millions of years; each winter and summer the snow is slightly different. The snow compacts and turns into ice as more falls each year. Ice cores have been drilled as two miles into the ice, revealing detail about the Earth's atmosphere up to 800,000 years ago.

Not so horrible history - This painting by Thomas Wyke painted in 1683 shows the River Thames frozen and being used for fairs and entertainment. He really wasn't imagining it. There are lots of historical accounts in diaries and paintings suggesting that this really did happen and more than once.



The period between 1300 and the 1800s has been named the Little Ice Age. Temperatures across the Northern Hemisphere were so cold that the Thames is thought to have frozen at least 23 times and some alpine villages were even swallowed up by growing mountain glaciers.

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Why does the climate naturally change?

Agent Benjamin reports three reasons - code name VPS - Very Solutions

1. **Volcanoes** - volcanic eruptions blankets the atmosphere, preventing it from feeling the Sun's warmth, so temperatures drop. Timescale: depends on tectonic activity, impact lasts for 1-2 years.

2. **Planetary movements** - the way the Earth moves through space causes different parts of the planet to experience different intensity of the Sun's energy, causing the seasons to change in length and severity. The changes happen over thousands of years in three ways.

- The Earth's orbit takes taking it further away from Sun during its annual journey. This is called the **eccentricity cycle**. Timescale: 100,000 years.
- Its **tilt** varies from 21.5° to 24.5° (40,000 years).
- The direction its axis points in **wobbles** (23,000 years).

3. **Solar activity** - the intensity of the Sun's warming effect on planet varies depending on how active it is. Black spots on the Sun indicate massive solar activity and cause more solar radiation to reach the Earth. These are called **sunspots**. Timescale: 11 years from maximum to minimum number of spots

Milankovitch, a mathematician, listed three astronomical explanations for the change in 1930, which are now known as the Milankovitch cycles.

- The Milankovitch cycles can affect the climate in the following ways:
- summers can get shorter, hotter or longer, colder or milder
 - winters can get shorter, hotter or longer, colder or milder
- ... find out more

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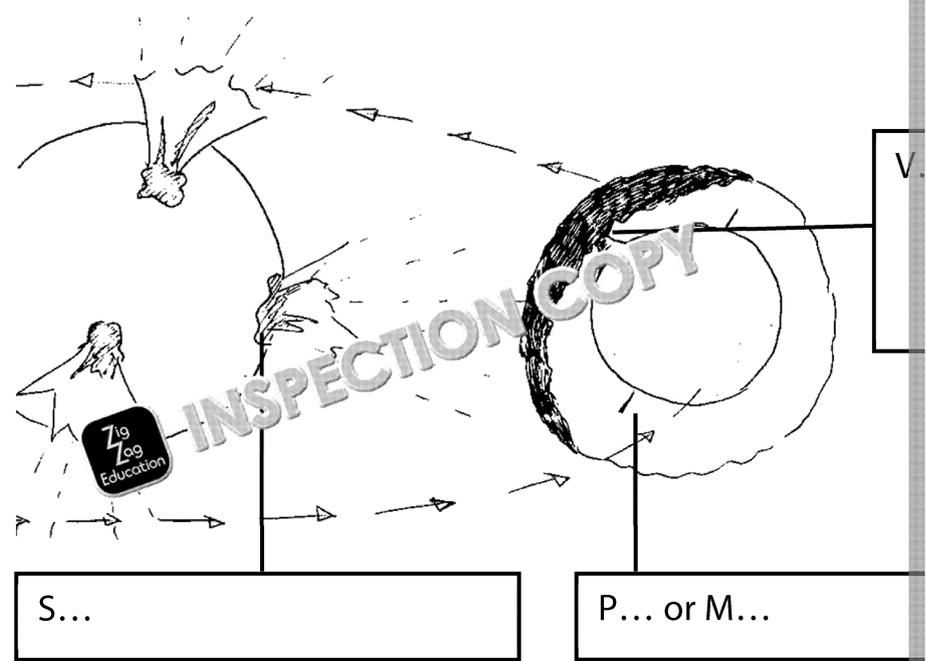
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Your mission

A report needs to be written to inform decision makers how scientists are able to tell us whether or not we are altering the natural rhythms of the Earth's climate. In your report you must do the following:

- Describe what has happened to global temperatures during the quaternary period.
- Describe what has happened to global temperatures during the last 2,000 years.
- Explain why scientists might disagree about whether the temperature of our planet is rising.
- Think about the advantages and disadvantages of the different sources of data used to tell us about the Earth's climate. Say why each technique is useful and what problems are associated with each. You could use a table to show your findings.
- Recommend the best data source for telling us about how the Earth's climate has changed. Be sure you say why it is better than the others, and explain any concerns you have.
- Annotate a diagram like the one below with explanations of the three natural causes of climate change.



- Compile a table like the one below to record the frequency of the impact of each natural cause of climate change.

Timescale		
Natural cause of climate change		

- Suggest how the different natural causes might interact to cause periods of unusually high or low temperatures on Earth.

Extension

Your report will be read by a committee of climate scientists who must decide if you are right or wrong. How would you go about investigating whether the climate has changed and whether human activity is a contributing factor? Give reasons for your answer. Make sure you talk about:

- time scale over which you would consider evidence
- methods you would use to detect changes
- way you would go about working out the impact of human activity

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Natural climate change: Patterns, causes and evidence answer

- Students should identify a maximum of three observations – one for each mark. For
 - They have regularly fluctuated over hundreds of thousands of years.
 - Lowest temperatures follow a decreasing trend.
 - Highest temperatures are mostly below present-day temperature.
- Students should identify a maximum of four observations – one for each mark. For e
 - The temperature has fluctuated, with a warmer period in medieval times
 - There was a colder period (known as the Little Ice Age) between 1400 and 1800
 - Temperatures have increased continually since 1900.
 - Present-day temperatures are much higher than historically during a similar length
- Award 1 mark for a reason and 1 mark for development of that idea. For example:
 - Fluctuating temperatures over long timescales make it hard to predict when temperatures will cool or continue to rise. Different scientists will interpret the data differently
 - Looking at trends over different timescales presents a different picture of how temperatures have changed. Scientists using different time frames will come to different conclusions.

- Award 1 mark for each correct observation – maximum of 6.

	Why useful	
Ice cores	Actual gas trapped during past time periods	Difficult to handle
Historical	Gives us visual clues of what life was like when the painting was made	Can be drawn from paintings There is no meteorological observations.
Deep-sea sediment	Tell us what types of species were alive at the time that sediments were laid down. From the fossils, scientists can work out the temperature on Earth must have been	This technique requires a lot of equipment working out information from fossils

- This is a comparison exercise; students can choose any data source but must argue why one source is more useful than others (2 marks – 1 for reason and 1 for developing that idea). The most useful source would not be so useful (1 mark). Some students will recognise that more data sources makes a stronger evidence base for climate change (additional 1 mark)

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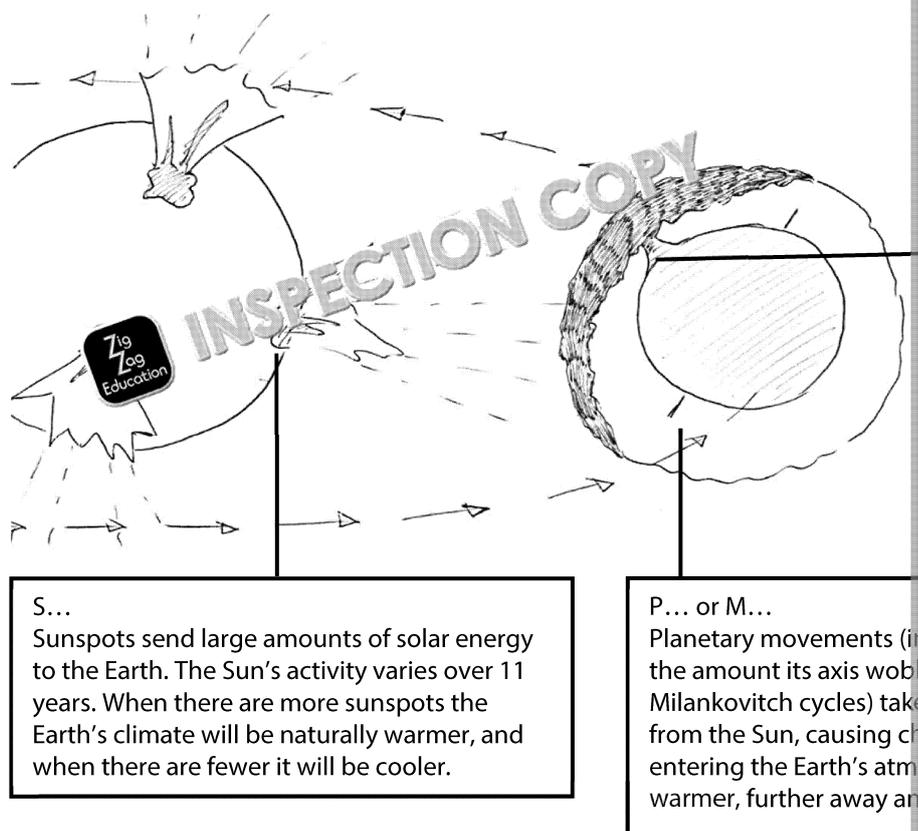
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6. Students should extract relevant information from the resource sheet and write the info in 2 marks for each text box – 1 mark for what is happening and 1 mark for the impact that it has on the Earth's climate.



7. Award 1 mark for identification of natural cause and the timescale.

Timescale	Natural cause of climate change	From 23,000 to 100,000 years
	Volcanic eruptions	Planetary movements

8. Award marks for recognition of:
- Unusually low temperatures (1 mark) – Milankovitch cycles coincide to create low temperatures exacerbated by minimum solar activity and if there were no active volcanoes on Earth.
 - Unusually high temperatures (1 mark) – Milankovitch cycles coincide to create high temperatures exacerbated by maximum solar activity and if a volcano on Earth erupted.

Extension

Students should use the information from their report to suggest ways to go about looking for evidence of human behaviour. For example:

- Recognising the importance of taking a look over longer timescales
- Identifying different sources of data that could be used, and any shortcomings of the data
- Comparing trends that could be predicted as a result of naturally occurring variations with those observed since the Industrial Revolution

Award students marks based on the detail and evidence base of their answer – it should be based on the resource sheet and students' further research. For example:

1–2 marks	As an outline of ideas without reference to evidence
3–4 marks	Outline of the relevant information based on information in the resource sheet
5–6 marks	Detailed suggestion based on evidence from the resource sheet – including some reasoning
7–8 marks	Detailed suggestions, well reasoned, with additional material from student research

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What are ecosystems and biomes?

	Description
Task 1	Students answer questions about ecosystems and processes
Task 2	Students consider how ecosystems can be altered through natural factors

In this lesson you will:

- ✓ answer questions on ecosystems and processes
- ✓ suggest how a biome could be altered by human and natural changes

Task 1

Answer the following questions:

1. Match the keywords to the definitions.

Ecosystem	Small-scale collection of plants and animals in an area and their physical environment.
Biome	Large-scale regions determined by climate, for example, several smaller communities

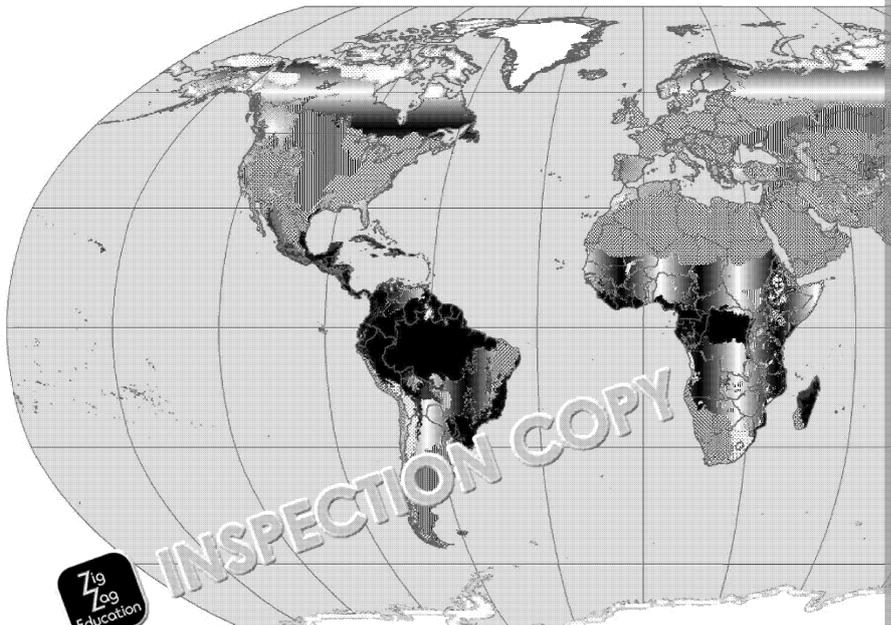
2. Study the map below. Explain whether it shows ecosystems or biomes.

.....

.....

.....

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3. Within an ecosystem, we can trace what eats what. A simplified version is called a food chain. There is a complex 'food web' because it is unlikely that an animal will have only one source of food.

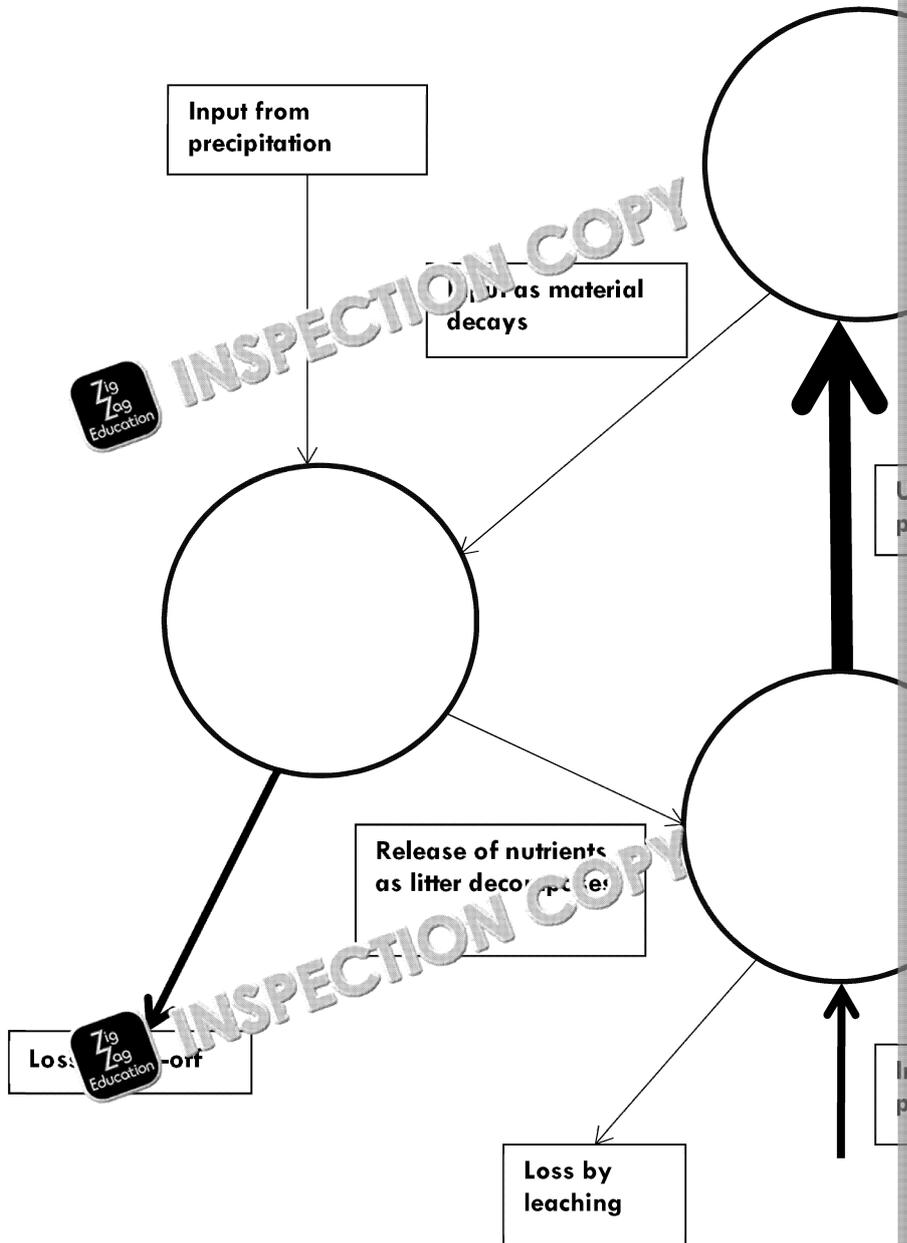
A simple food chain might look like this:

Oak tree → caterpillar → vole → buzzard

- a) Which is the top predator in this example?
- b) Which is the primary producer?
- c) What is the vole in this example?
- d) Oak trees are deciduous – they drop their leaves in the autumn. However, you are not knee-high in dead leaves. So what is the name of an organism that decomposes dead organic material?

4. Nutrients can be stored and transferred within an ecosystem. Complete the diagram below.

- soil
- biomass
- litter



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5. Ecosystems can be divided into biotic (living) and abiotic (non-living) factors. Use the words below. Watch out for the red herring.

Ecosystems derive their energy from the Sun – plants take this energy and turn it into food through a process called _____. The amount of warmth, sunshine and rainfall determine which types of plant can live in a particular area. But few plants can live in a desert – the water must evaporate from the ground _____ and is then absorbed through the _____ of plants. Soil is made from weathered _____ and also from decayed living material (biomass). Plants and soils are home to many organisms such as _____ and insects. Some plants even live on other plants.

rainfall	rock	soil
roots	photosynthesis	moon

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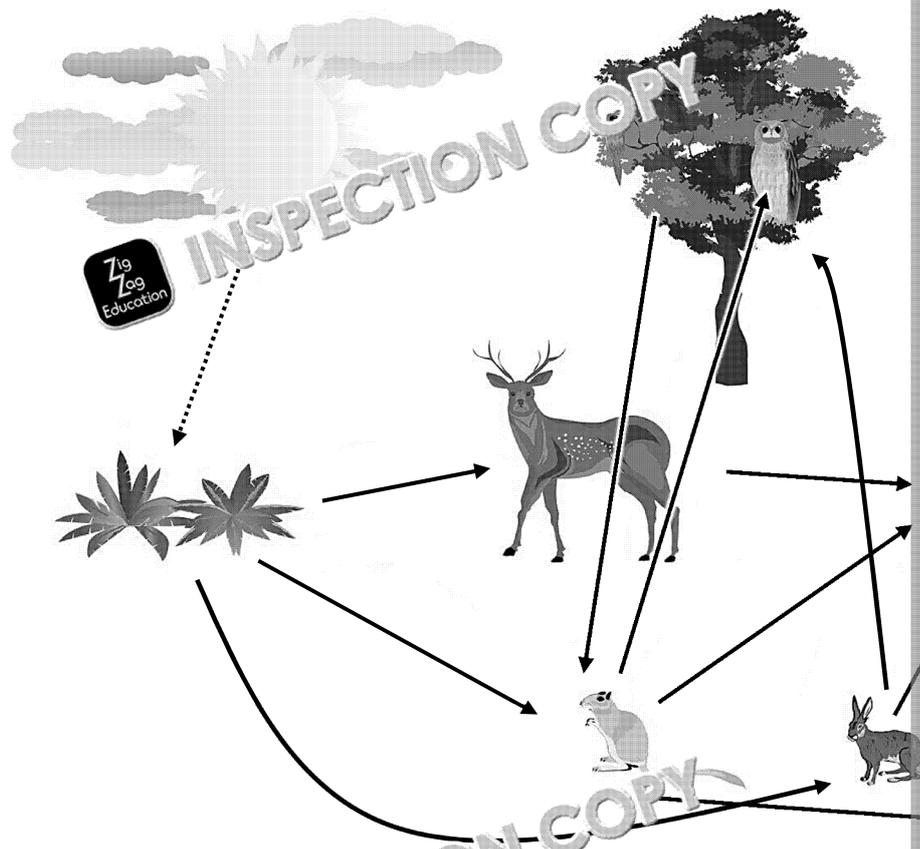
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Task 2

Ecosystems are said to be in balance. But things can change quickly if species diversity is reduced. This can happen naturally or through human activity.



1. Suggest five ways in which this ecosystem could be affected by natural causes

1.
2.
3.
4.
5.

2. Suggest five ways in which this ecosystem could be affected by humans

1.
2.
3.
4.
5.

3. Now explain how loss of one species may affect the balance of the ecosystem

-
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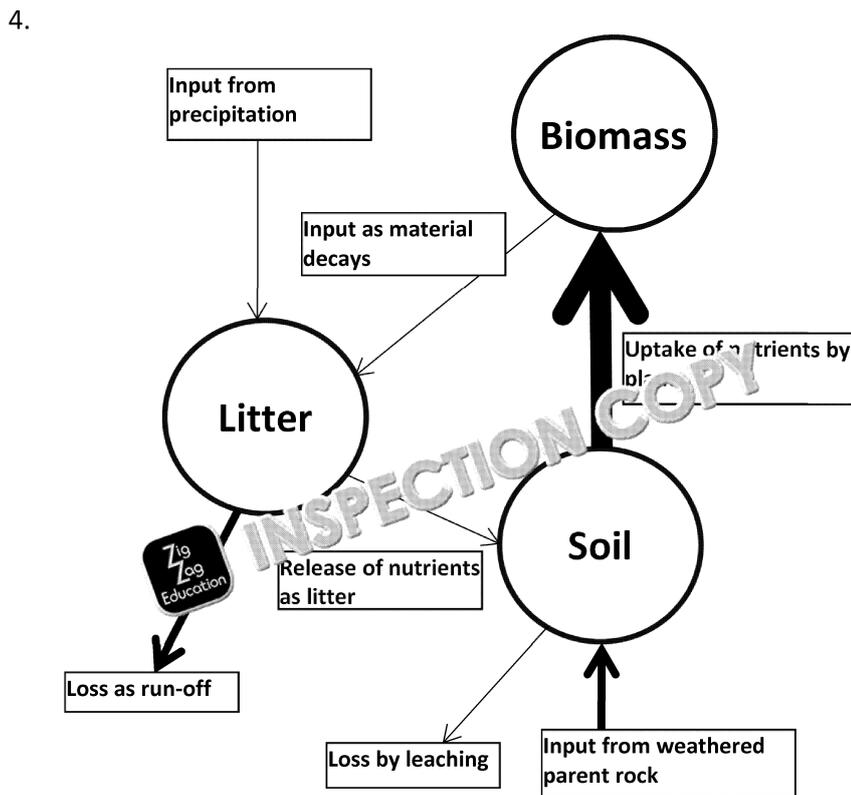
What are ecosystems and biomes? (I) answers

Task 1

- | | | |
|------------------|---|--|
| Ecosystem | → | Small-scale collection of plants and animals in an area with their environment |
| Biome | → | Large-scale regions determined by climate, for example smaller countries |

2. Biomes – very large scale. For example, most of the UK is lumped into one biome, but you can find more information here

- Bullfinch
 - Oak
 - Consumer (secondary)
 - Decomposer



5. Ecosystems derive their energy from the Sun – plants take this energy and turn it into **photosynthesis**. The amount of warmth, sunshine and **rainfall** will determine which particular area. But few plants can take water directly from rain – the water must enter through the **roots**. Soil is made from weathered **rock** (the mineral component), and **biomass**. Plants and soils are home to many different living things, such as **animals** on other **plants**!

Task 2

- Allow any suitable suggestions, such as: fire, introduction of a disease into the area, extreme weather event or natural disaster.
- Allow any suitable suggestions, such as: deforestation or clearing the land, accidental animals, hunting, ecosystem management, etc.
- Allow any suitable suggestions, such as: removing top species will increase population increase consumption of plants. Decreases in the number of plants will reduce food species at the top.

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What are ecosystems and biomes?

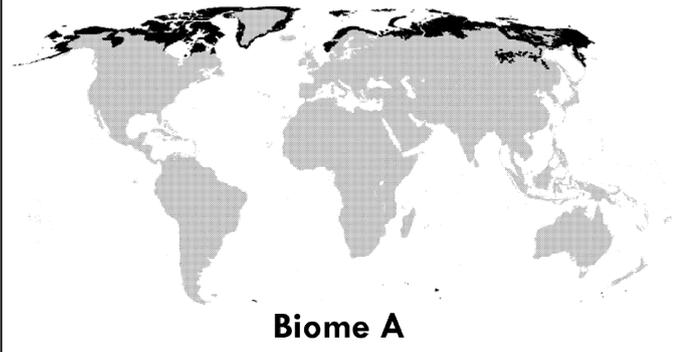
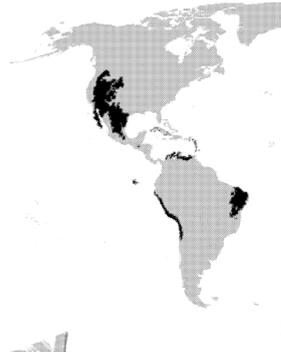
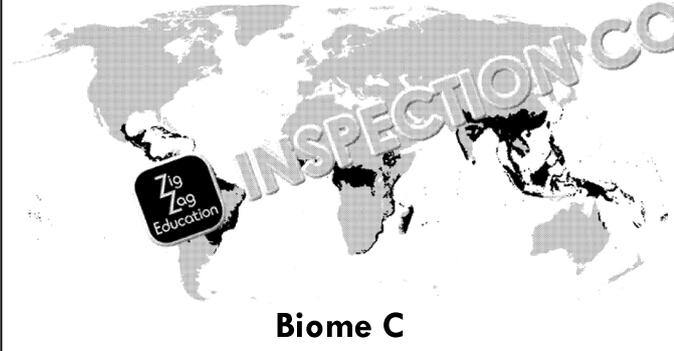
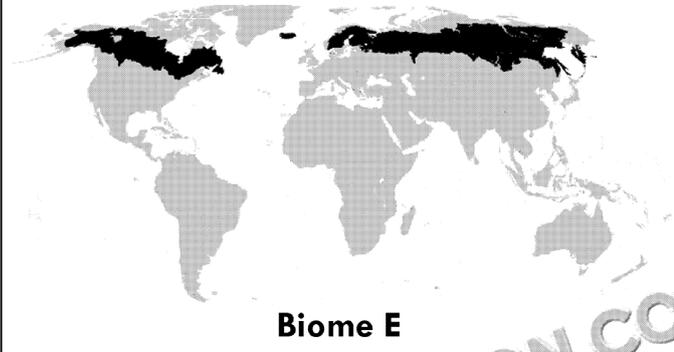
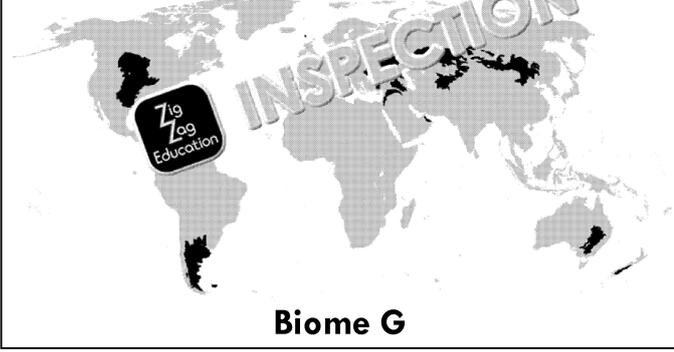
	Description
Task 1	Students identify and compare different biomes
Task 2	Students consider the importance of ecosystems (ecosystem goods and services)

In this lesson you will:

- ✓ identify and compare different biomes
- ✓ consider why different biomes can provide us with goods and services

Task 1

The maps below show different biomes.

 Biome A	 Biome B
 Biome C	 Biome D
 Biome E	 Biome F
 Biome G	 Biome H

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Can you identify all of the biomes? The options are given below.

Tropical grassland Desert Boreal forest (taiga) Temperate broadleaved woodland	Tundra Temperate grasslands Tropical forest Mediterranean
Biome A = Biome B = Biome C = Biome D =	Biome E = Biome F = Biome G = Biome H =

Now choose two of the biomes. You will compare and contrast them. Fill in the following table.

	Biome:	Biome:
Location		
Type of climate		
Sketch of climate graph		
Types of plants		
Types of animals		

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Task 2

Ecosystems provide us with a lot of useful things. They provide us with goods – *cc* may not see but are vitally important – services.

How many goods and services can you think of that woodlands provide for us?

-
-
-
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-

What are the possible impacts on the woodland that might occur as a result of *oo* services that you have listed above?

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What are ecosystems and biomes? (II) answers

Task 1

- Biome A = Tundra
- Biome B = Desert
- Biome C = Tropical forest
- Biome D = Tropical grassland
- Biome E = Boreal forest (taiga)
- Biome F = Temperate broadleaf forest
- Biome G = Temperate grassland
- Biome H = Savanna

Task 2

Woodlands provide us with:

- Goods – such as timber and wood products, fuel and medicines
- Services – such as water and air purification
- Recreation and leisure activities – such as walking and cycling

They also provide services to other plants and animals.

Impacts could include:

- Goods – timber taken from the woodland (deforestation), fuel (deforestation) and medicines
- Services – water removed may reduce growth of the woodland.
- Recreation and leisure activities – soil erosion, footpath degradation, wildlife loss.

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Coastal processes (I)

	Description
Task 1	Definitions
Task 2	Subaerial weathering, erosion, longshore drift, mass movement and transport
Task 3	Erosion and deposition

In this lesson you will

- ✓ define key terms
- ✓ analyse diagrams to explain the processes of subaerial weathering, erosion, waves
- ✓ fill in the gaps to explain erosion and deposition

Task 1

Below are five key terms. Write down what you think they mean. Be careful – some are actually quite different! You have one minute per term.

Weathering:

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.....

Erosion:

.....
.....

Mass movement:

.....
.....

Longshore drift:

.....
.....

Deposition:

.....
.....

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Task 2

Take a look at the photograph below, showing a section of Norfolk's coast. The cliffs are made of loose (unconsolidated) glacial deposits.



Explain how and why the coast might change under the following conditions:

Storm waves are crashing at the base of the cliffs.

.....
.....

It's raining. Wind is blowing the rain onto the cliffs.

.....
.....

Heavy rainfall means that water is pooling on the land above; water is flowing down the cliff face.

.....
.....

It has rained a lot over the last few months. The cliffs are saturated.

.....
.....

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A type of bird called a sand martin has claimed the cliff as a nest site during the busy carving out their nests!

.....

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It is high tide and waves carry material out to sea.

.....

.....

Can you see evidence of these processes in the photograph?



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Task 3

Complete the following paragraph using the words in the list below.

Coasts are very different. They have different _____ of erosion important in influencing the coastal processes – they can be constructive or _____ Constructive waves build up beaches because they have a strong _____ waves erode because of their strong _____ as they pluck the rock. The distance that waves have travelled is called the _____. The greater the wave – for example, the west coast of the UK has a long travel distance across the ocean – unlike the east coast. This is why there are low- and high-energy coastlines. In high-energy coastlines, _____ is the dominant process, and in low-energy coastlines, _____ is the main process. But the two have to occur together – there's nothing to deposit if you don't generate the material in the first place!

Much of the erosion in coastal environments occurs during the _____ by storm waves. _____ action is where air and water are forced against the cliff, increasing the _____ Cliffs are _____ where material is swirled down the cliff, or material is hurled at the cliffs. Material on the beach is eventually worn down and carried to another – this is called _____.

fetch	swash	deposition	hydraulic	
destructive	winter	attrition	holiday	
rates				

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Coastal processes (I) Answers

Task 1

- **Weathering** – in-situ breakdown of rock by water, chemical action or heating and cooling.
- **Erosion** – breakdown and removal of rock by water, wind, etc.
- **Mass movement** – down-slope movement of material under gravity, often lubricated.
- **Longshore drift** – the movement of material along a beach where waves break at an angle.
- **Deposition** – accumulation of material where energy is lost – for example, material deposited where waves break. Wind-blown sand accumulates in dunes.

Task 2

Storm waves are crashing at the base of the cliffs. Spray is blowing onto the cliffs.

- How – the cliffs are likely to be undercut and retreat towards the land. Material is likely to be eroded from the cliffs and retreat.
- Why – storm waves are highly erosive (and the cliffs are made of loose material). The processes involved, such as hydraulic action and abrasion. Once a sufficiently large notch is formed, the cliff becomes unsupported and collapses.

It is raining. Wind is blowing the rain onto the cliffs.

- How – water runs down the cliffs and it may erode material as it flows downwards.
- Why – as the water flows down the cliffs, loose particles are eroded.

Heavy rainfall means that water is pooling on the land above; water is flowing down the cliffs.

- How – similar to rainfall above but likely to be a larger quantity of water and, therefore, more erosive.
- Why – there is more water, which is likely to be moving at a faster velocity. Faster flow means more erosion because it has more dissolved material.

It has rained a lot over the last few months. The cliffs are saturated.

- How – sections of the cliffs may collapse; for example, a rockfall or flow.
- Why – the material is saturated with water, making it weaker than normal. It is more likely to undergo mass movement.

A type of bird called a sandpiper has claimed the cliff as a nest site during the summer. The birds are nesting in the holes.

- How – the birds will have holes retreating horizontally.
- Why – this is a form of biological weathering.

It is high tide and waves carry material out to sea.

- How – material which has collapsed onto the beach is transported away, exposing the beach.
- Why – occurs when there is a stronger backwash than swash.

Can you see any evidence of these processes in the photograph?

- The cliffs have clearly retreated – the turf at the top is clearly overhanging.
- There is a pile of debris at the base of part of the cliff – this could be the result of a mass movement or the result of undercutting.
- While there is evidence of coastal retreat across the whole cliff face, there are areas where the cliff has advanced. This shows that the material has been transported away.

Task 3

Coasts are very different. They have different **rates** of erosion and deposition. Waves are a key coastal process – they can be constructive or destructive. Constructive waves build up the beach through their **swash**, whereas destructive waves erode the beach because of their strong **backwash** as they pull water back out to sea. The distance that waves have to travel to reach the shore is called the **fetch**. The greater the fetch, the more energy the waves have. The west coast of the UK has a long travel distance across the **Atlantic**, unlike the east coast. On the east coast, the high-energy coastlines, **erosion** is the dominant process, and in low-energy coastal environments, **deposition** is the dominant process. Erosion and deposition often have to occur together – there's nothing to deposit if erosion is occurring in the first place!

Much of the erosion in coastal environments occurs during the **winter**, when cliffs are battered by waves. Hydraulic action is where air and water are forced into rock cracks and fissures, increasing the pressure. Abrasion is where material is swirled around at the base of the cliff, or material is hurled at the cliffs. Material is broken down as particles knock into one another – this is called **attrition**.

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River processes

	Description
Task 1	Students answer questions on river processes
Task 2	Students label the long profile of a river to show how rivers change
Task 3	Students study the Bradshaw model and explain why rivers change
Task 4	Students discuss (and research) an example of a river and whether it fits with the theoretical Bradshaw model

In this lesson you will:

- ✓ use your knowledge of river processes
- ✓ consider how rivers change down their long profiles
- ✓ explain why rivers change down their long profiles
- ✓ assess whether rivers do, in fact, follow a theoretical model

Task 1

1	Match the types of river erosion to their definitions.	Hydraulic action		The flow cracks in
		Solution		The river becomes rounder
		Abrasion		Load material and river
		Attrition		Soluble rocks dissolve
2	Name the form of transport which moves the largest load in a river.			
3	Which form of transport causes the 'bounce' along the bed?			
4	Which form of transport causes the river to appear muddy?			
5	Which form of transport may be invisible?			
6	When do rivers erode the most, and transport the most load?			
7	Where might a river erode the most – on the inside or outside of a bend?			
8	Where might a river deposit the most load – on the inside or outside of a bend?			
9	Which type of load will be deposited last? Why?			
10	How does mass movement add load to a river?			
11	Which form of erosion widens the river? Circle the correct answer.	Vertical erosion		
12	Which form of erosion deepens the river? Circle the correct answer.	Vertical erosion		
13	What is the difference between a 'long profile' and a 'cross profile'?			
14	Sketch the cross profile of a river near the river's <u>source</u> .			
15	Sketch the cross profile of a river near the river's <u>mouth</u> .			

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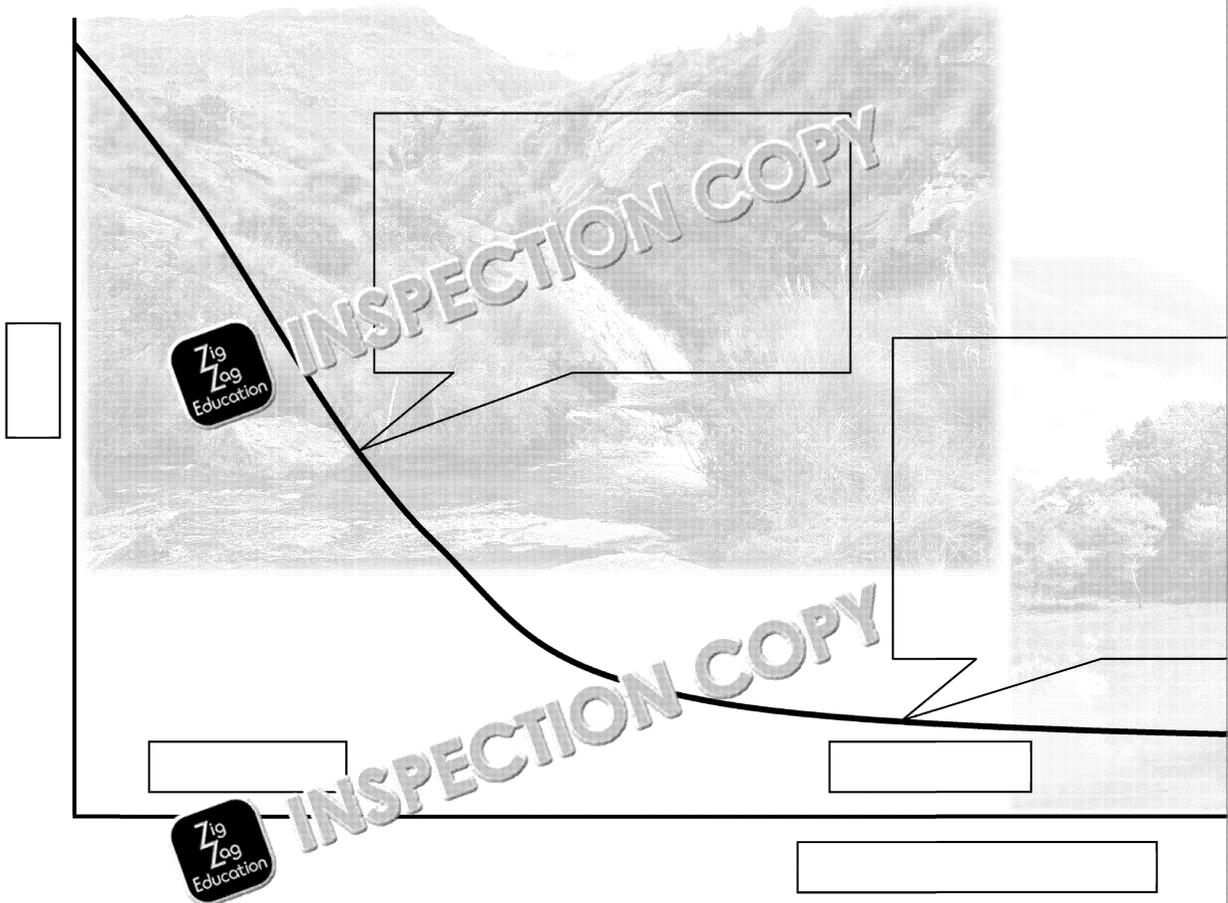
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Task 2

Below is the long profile of a typical river. Using the labels in the grid below, fill in the empty boxes. There may be more than one label per box.

Interlocking spurs and waterfalls	High	Middle course	V
Lots of suspended load	Mostly lateral erosion	Increased lateral erosion	D
Lower course	Floodplains and levees	Meanders	V
Narrow channel	May form an estuary	Very wide channel	W



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Task 3

1. The diagram below shows a simplified Bradshaw model. This is a theoretical along its long profile.

Using the diagram, and your own knowledge, explain how rivers change thro

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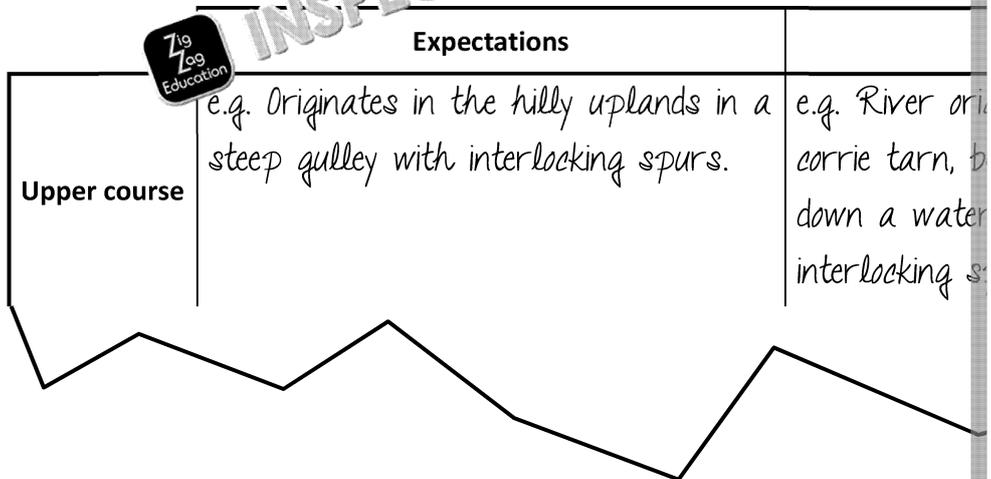


Task 4

You will have studied a river as part of your course. If not, you will need to look at

Your task is to assess how the processes and features of your example fit with the that you completed in Task 2, and the Bradshaw model in Task 3. Does your exam anomalies due to local factors and conditions?

You may choose to draw a table such as the one below.



	Expectations	
Upper course	e.g. Originates in the hilly uplands in a steep gully with interlocking spurs.	e.g. River originates in a highland area, flows down a watercourse with interlocking spurs.

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River processes answers

Task 1

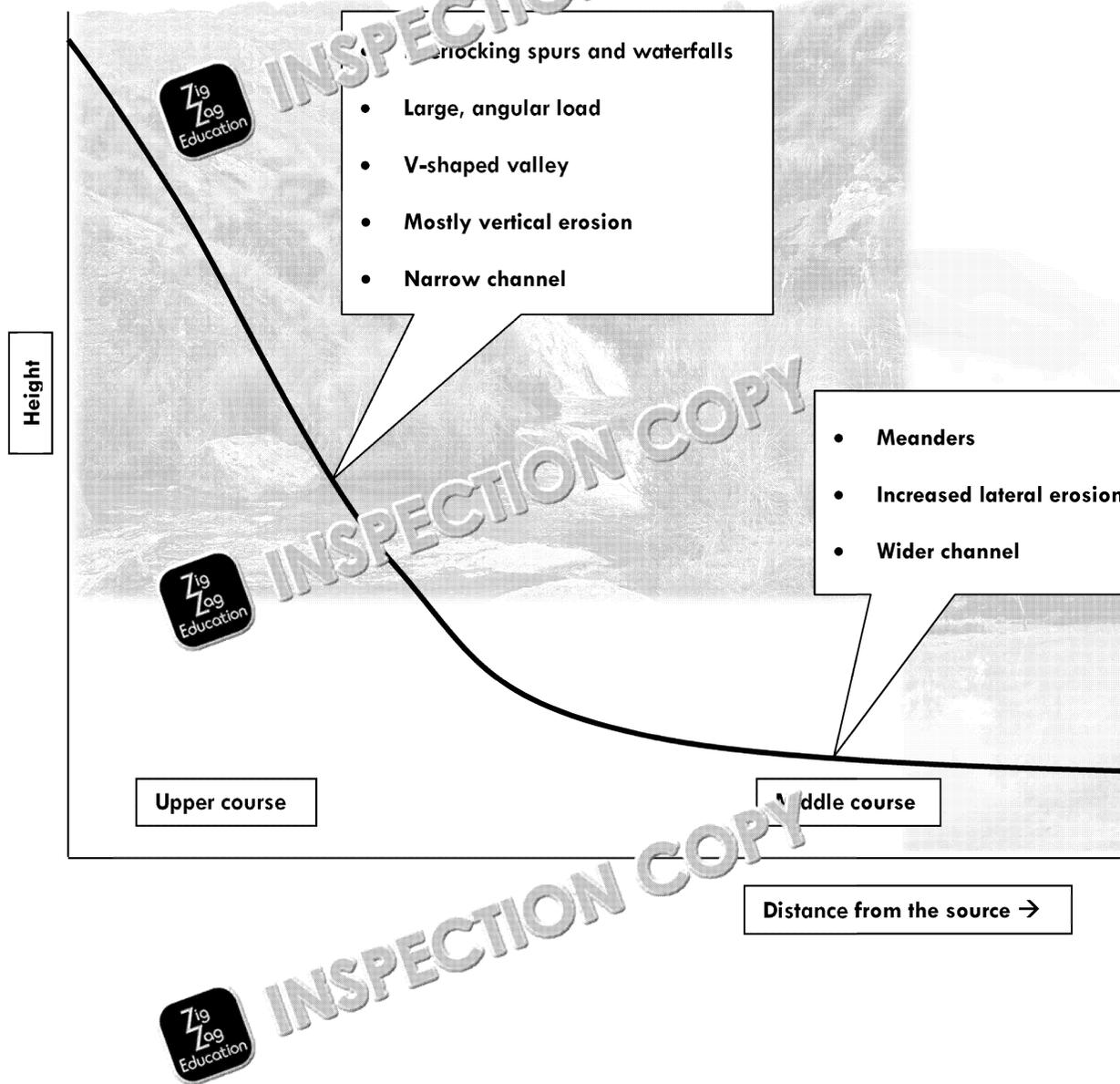
1	Match the types of river erosion to their definitions. 	<table border="1"> <tr> <td>Hydraulic action</td> <td>→</td> </tr> <tr> <td>Solution</td> <td>↗</td> </tr> <tr> <td>Abrasion</td> <td>→</td> </tr> <tr> <td>Attrition</td> <td>↘</td> </tr> </table>	Hydraulic action	→	Solution	↗	Abrasion	→	Attrition	↘
Hydraulic action	→									
Solution	↗									
Abrasion	→									
Attrition	↘									
2	Name the form of transport which moves the largest load in a river.	Traction								
3	Which form of transport causes load to 'bounce' along the bed?	Saltation								
4	Which form of transport causes the river to appear muddy?	Suspension								
5	Which form of transport may be invisible?	Solution								
6	When do rivers erode the most, and transport the most load?	During flood events								
7	Where might a river erode the most – on the inside or outside of a bend?	Outside								
8	Where might a river deposit the most load – on the inside or outside of a bend?	Inside								
9	Which type of load will be deposited first? Why?	The smallest material because it requires less energy to keep it in suspension.								
10	How does mass wasting add load to a river? 	Material is weathered, eroded and transported (by mass movement) from the slopes above the river, and is influenced by the river process.								
11	Which form of erosion widens the river? Circle the correct answer.	Vertical erosion								
12	Which form of erosion deepens the river? Circle the correct answer.	Vertical erosion <input checked="" type="checkbox"/>								
13	What is the difference between a 'long profile' and a 'cross profile'?	The long profile shows the elevation of the river from source to mouth. The cross profile shows a slice through a river at a particular point.								
14	Sketch the cross profile of a river near the river's <u>source</u> .									
15	Sketch the cross profile of a river near the river's <u>mouth</u> .									

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Task 2



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Task 3

Discharge	Increased input from groundwater (base flow) and the addition of surface runoff.
Average velocity	Reduced size of load and roughness of the channel, reducing friction and increasing contact with the banks compared to the overall value.
Load quantity	More time has passed to allow erosion to occur. The large load can support a lot of fine sediment transported from upstream.
Load particle size	Attrition occurs, reducing the size of particles more the longer they are transported downstream.
Channel bed roughness	Hydraulic action and abrasion occur, making the bed and banks smoother.

After these points have been covered, allow any other valid points and reasoning provided.



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Glacial processes and landforms

	Description
Task 1	Students define keywords
Task 2	Students use a contour map to identify glacial features
Tasks 3, 4 and 5	Students identify and explain depositional features
Task 6	Students complete a fact file on a chosen glaciated region

In this lesson you will:

- ✓ define keywords
- ✓ study a contour map to pick out glacial features
- ✓ identify and explain depositional features
- ✓ complete a fact file to explore the development of a glacial landscape

Task 1

Write down definitions of the following words:

1. **Freeze-thaw weathering**

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2. **Plucking**

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3. **Abrasion**

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4. **Bulldozing**

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5. **Till**

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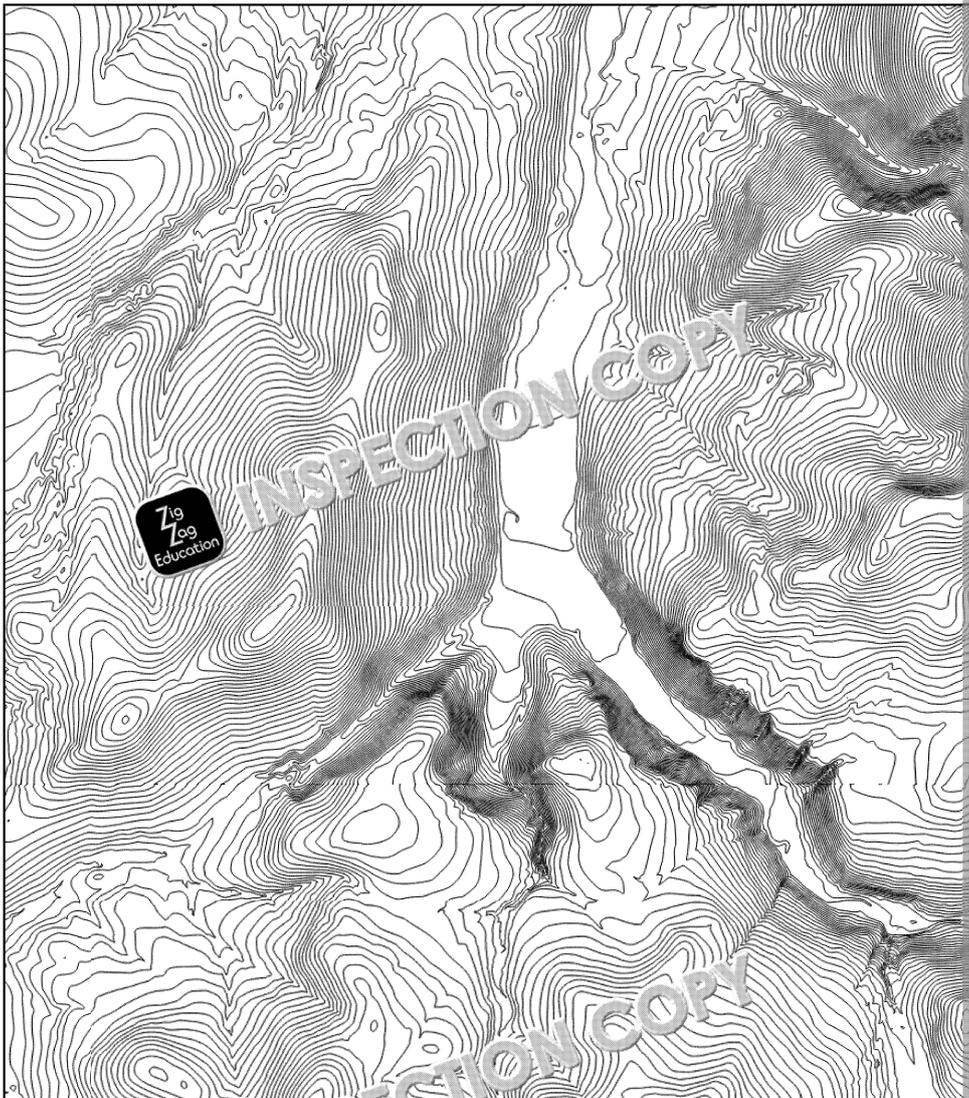


Task 2

Below are descriptions of several glacial landforms.

A contour map is provided. Can you identify any glacial features shown on the map?

- **Corrie** – a circular hollow formed by a corrie glacier with a steep back wall. Many are filled by small lakes (tarns).
- **Arête** – a ridge like a knife edge, often separating two corries.
- **Pyramidal peak** – a high peak created by three or more back-to-back corries.
- **Truncated spur** – an isolated rocky spur with the sides removed by glacial erosion.
- **Glacial trough** – a deep, U-shaped valley formed when a valley glacier erodes a valley.
- **Ribbon lake** – long, narrow body of water on the valley floor, formed where a lake is dammed by the valley glacier.
- **Hanging valley** – a small upland valley, carved out by tributary glaciers, which has been abandoned when the main glacier has melted.



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Task 3

Study the photograph below and answer the following questions.



1. Identify and show

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2. Suggest expected

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3. How might the feature have been formed?

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4. Do these features occur in isolation or in a group?

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Task 4

Study the photograph below and answer the following questions.



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Task 5

The photograph shows the snout (end) of a glacier.



Describe the processes operating within the photograph.

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Task 6

There are no glaciers left in the UK, but we can easily see where the ice sheets and from the glacial features of Snowdonia, the Lake District and Scotland to the thick covering parts of our lowlands, or to the formation of Malham Cove from meltwater that landscapes were not simply formed over one ice age!

Your task is to choose a landscape where there is evidence of glacial influence and how the landscape was created. You may have studied this in class, or you can look provided by your school. If you don't have access to these resources, you could use

Your fact file should discuss:

- how the landscape looked before glacial erosion/deposition
- the effects of glacial erosion/deposition on the landscape
- evidence for erosion/deposition – what are the features?

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Glacial processes and landforms answers

Task 1

1. Freeze-thaw weathering – breakup of rock where water turns to ice during the night, water freezes from the surface down, and volume increases as the freezing occurs, in This eventually causes the rock to disintegrate.
2. Plucking – water freezes to rocks under the glacier. As the glacier moves, the surface especially where rock is well jointed, or in the lee of a rock step.
3. Abrasion – moraine at the base of the glacier, dragged along by the glacier, wearing a
4. Bulldozing – advancing ice pushes moraine further down the valley, forming a ridge of
5. Till – unsorted material, eroded and deposited by a glacier.

Task 2

- Main glacial trough shown in the centre of the map (there may be a ribbon lake in the
- Hanging valley to the north-east
- There are at least two pyramidal peaks on the western side
- There are arêtes associated with the pyramidal peaks

Task 3

1. Drumlin
2. Possibly from left to right – the left-hand side (stoss) appears to slope at a steeper angle
3. The glacier deposited material, which was then shaped through glacial erosion
4. Often in groups, called a ‘swarm’ or ‘basket of eggs’

Task 4

1. Medial moraine is in the centre. Lateral moraine is located at the periphery (far left and right). This suggests that the bands of the moraine to the left and right are formed from different medial moraines from different
2. Medial moraines occur where tributary glaciers combine – and are, therefore, formed

Task 5

- The glacier is likely to be retreating/thinning (there is moraine shown higher than the current level and subglacial meltwater is flowing away).
- Moraine is being deposited as the glacier retreats, leaving behind a till plain.
- The water exiting the glacier will rework the till on the outwash plain, allowing sorting

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What is urbanisation?

	Description
Task 1	Features of urbanisation
Task 2	Causes of urbanisation
Task 3	Global urban trends
Task 4	Effects of urbanisation

In this lesson you will

- ✓ learn about the features of urbanisation
- ✓ learn the causes and effects of urbanisation
- ✓ learn about the global trends of urbanisation

Task 1

1. Tick the box next to the description that best defines urbanisation.

Definition
<input type="checkbox"/> The rate at which people are moving to cities.
<input type="checkbox"/> The number of towns which become classified as cities.
<input type="checkbox"/> The physical expansion of cities into rural areas.
<input type="checkbox"/> The physical expansion and population increase of towns and cities.

2. Complete the mind map below to show some of the common features of an urban environment. An example has been done for you.

Several buildings

Features of an urban environment

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Task 2

Match the causes of urbanisation to the corresponding descriptions.

Cause
<p>Natural increase</p> 
<p>Migration</p>
<p>Internal growth</p> 
<p>Push factors</p>
<p>Pull factors</p> 

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<p>A rise nature These health prever mater also b hence expect</p>
<p>May in oppor access exclus health</p>
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<p>Cities to urb city be into ac popul outski of the</p>

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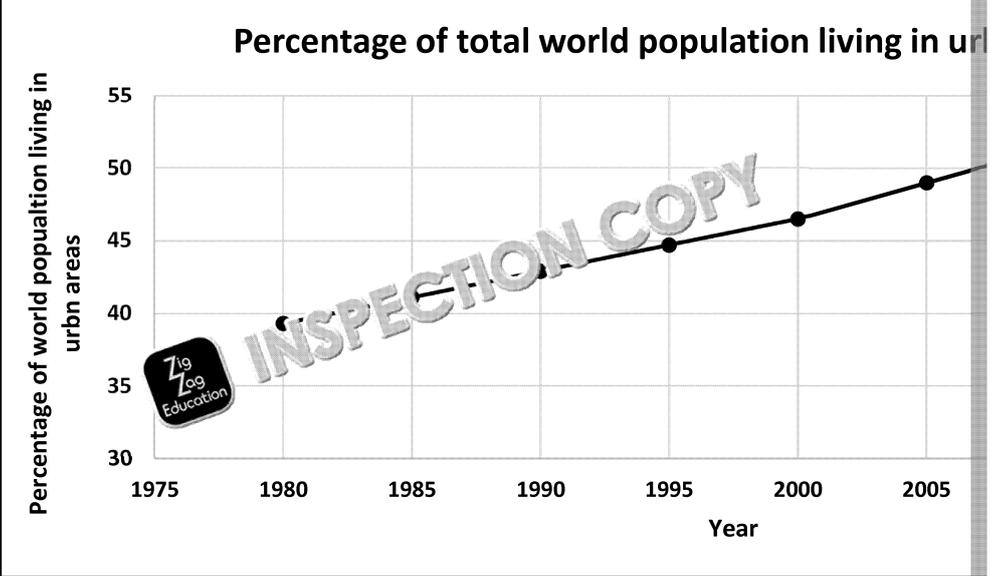


Task 3

1. Fill in the gaps with the words in the box below.

It is important to point out that the definition of '_____ ' is because it is difficult to find a cut-off point for urban _____. Different sources of _____ data 'metropolitan area' or 'urban area' set different points for what constitutes as a _____. This makes comparing _____ populations from different sources _____. It is also _____ to get an accurate _____ some people being _____ (not on the latest census) or _____ are often left out of official statistics due to the _____ nature

urban sprawl	difficult	undocumented	demographic
informal	boundaries	city	unreliable



2. Study the graph above before answering the questions below.

a) In what year did the percentage of people living in urban areas pass more than 45% of the world population?

.....

b) Describe the trend of the graph.

.....

c) How does the graph link to urbanisation?

.....

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Task 4

Urbanisation has both causes and effects. Spend a few minutes to reread the ca completing the task below.

- 1. What are the issues with urbanisation? Use the sentence starters to help w

Urbanisation is...

Some push factors that cause rural-urban migration include...

This may be an issue for the rural area that people have moved from because...

Pull factors of rural-urban migration include...

This may become an issue for the urban area that people are moving to by and education services. This is an issue because...

How this issue may be managed by...

Other impacts of urbanisation include environmental issues such an increase caused by harsh chemical fumes and affects both people and the natural en

Another example of an issue caused by urbanisation is

This issue because...

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What is urbanisation? Answers

Task 1

1. The physical expansion and population increase of towns and cities.
2. Answers include but are not limited to: infrastructure (roads, buildings, pipelines and of services (health, education, social, and other public services), houses, CBD (central recreational spaces, urban sprawl, lack of open green space).

Task 2

Cause	Description
Natural increase	May include: more job opportunities, better social life, better accessibility, better facilities, similar social/cultural issues.
Migration	A rise in population may occur. These may include improvements in healthcare, preventable deaths and fewer diseases. It could also be due to people living longer, increasing the life expectancy.
Internal growth	May include: lack of job opportunities, social/cultural exclusion and education facilities.
Push factors	This is the movement of people from rural areas to urban areas. The movement of people from rural areas to urban areas is due to push and pull factors resulting in migration.
Pull factors	Cities expand and grow; this means that the city boundary is no longer fixed. It now covers a wider range of the population. It is now considered a city.

Task 3

1. It is important to note that the definition of 'city' is often contested. This is because different sources of demographic data, largely due to **urban sprawl**. Different sources of demographic data, such as 'metropolitan area' or 'urban area' as cut-off points for what constitutes as a city (or makes comparing urban populations from different sources **unreliable** and **inaccurate** population statistic due to some people being **undocumented** (not on the list) (some slum areas are often left out of official statistics due to the **informal** nature of urbanisation).
2.
 - a) 2008 (accept 2007).
 - b) The percentage of the world's population living in urban areas increases over time.
 - c) The graph shows how the percentage of the world's population living in urban areas increases over time.

Task 4

Answers will differ between students, but some example answers are outlined below:

- **Urbanisation is:** the increasing number of people living in towns and cities, includes the physical expansion of towns and cities.
- **Some push factors that cause rural-urban migration include:** lack of jobs, no social services, poor infrastructure, etc.
- **This may be an issue for the rural area that people have moved from because...** lack of services / teachers / service providers. This is bad for the economy and for the local community.
- **Pull factors of rural-urban migration include:** more job opportunities, better social services, better infrastructure, etc.
- **This may be an issue for the urban area that people are moving to by placing services.** This is an issue because of overcrowding; higher demand for teachers/doctors/professionals may lead to shortages elsewhere.
- **However, this issue may be managed by:** local funding into schools and hospitals, attracting health professionals, embracing new technologies and advances in the digital sector.
- **Other impacts of urbanisation include environmental issues such an increase in air pollution, chemical fumes and affects both people and the natural environment by:** damaging buildings, causing/affecting respiratory (breathing) problems for people.
- **Another example of an issue caused by urbanisation is:** social tensions.
- **This is an issue because:** people may be discriminated against for their ethnicity/gender.

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What is development?

	Description
Task 1	Defining development
Task 2	Measuring development
Task 3	The global distribution of development
Task 4	Demography and development

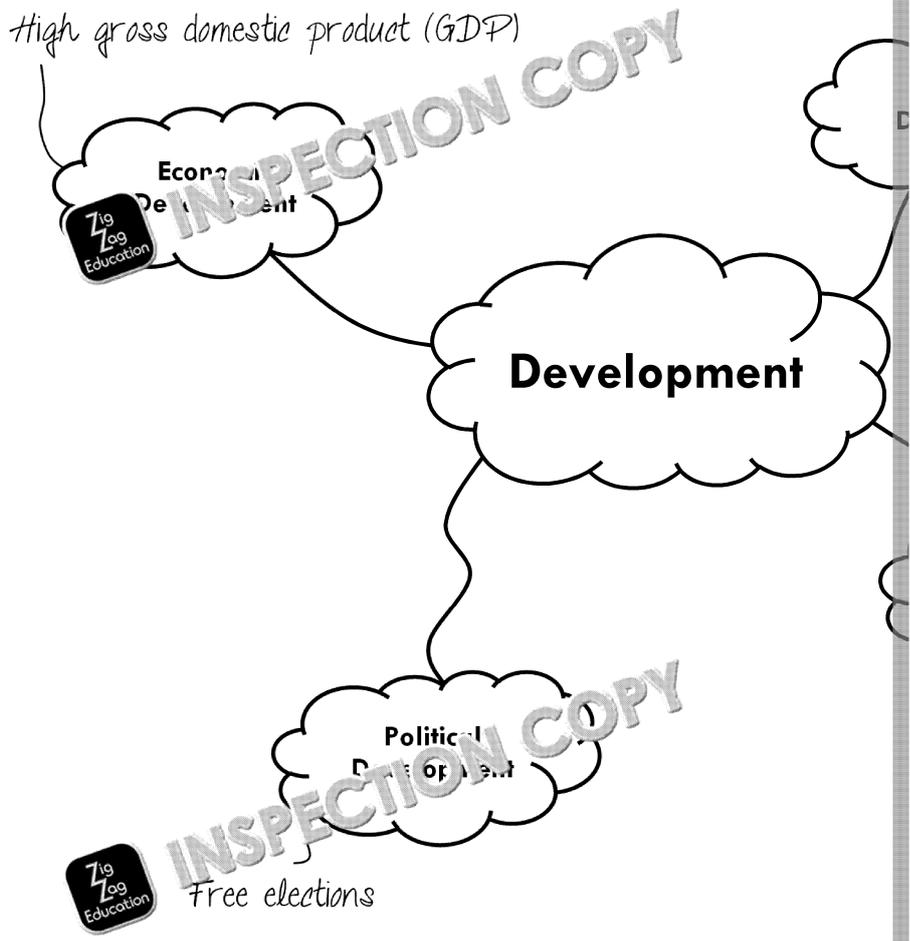
In this lesson you will:

- ✓ learn to define development
- ✓ learn how to measure development and why methods of measurement differ
- ✓ learn about the global distribution of development
- ✓ learn about the relationship between demographic data and development

Task 1

Development can be difficult to define as everyone has different ideas of what it means. Different Geography exam boards, as well as different intergovernmental organisations, have different views of what it means to be a 'developing' country. Technically speaking, all countries are 'developing' but some countries are more economically, socially, politically and environmentally developed than others.

1. Fill in the mind map to show examples of what development means. An example is provided.



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Task 2

1. Match each measurement of development to the corresponding description.

Measurement of development
<p>HDI</p> 
<p>GNI per capita</p>
<p>GDP per capita</p>
<p>GINI</p> 
<p>HIC</p>
<p>LIC</p>
<p>NEE</p> 

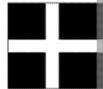
<p>Gr... of t... yea... ser... pop... rep... cou...</p>
<p>Ne... mic... bee... yea... GN... rap... tak...</p>
<p>Cor... Bas... cou... fac... usi... we... spe...</p>
<p>Hig... tha... cap... and... Hig... hav... see...</p>
<p>Low... tha... cap... and... cor... Off...</p>
<p>Hu... me... int... edu... cap... cor... mu...</p>
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Sometimes one measurement of development will give people a different view of development compared to the same measurement for a different country. This may be because some measurements are singular indicators that show an average. Singular indicators may not be a true representation of development as averages between the richest percentile and the poorest percentile. For example, in India there is a large income inequality. While the country is home to some of the richest people in the world, it is also home to some of the poorest. India is seen as an emerging country. Its GDP was estimated to be around 2,263,792 million US\$ (2016), which is ranked seventh highest in the world, far above highly developed countries like Denmark and Switzerland. However, India's GNI per capita is estimated at around 1,670 US\$ in the world. The country with the highest GNI per capita in 2016 was Switzerland with 56,990 US\$, Norway coming in close second with US\$81,900. One reason for such a big contrast is that India has a significantly larger population than Norway and Switzerland, so when measurements are averages of a much larger range. This data shows how some singular indicators are not always the most accurate representation of development.

Development indicator	India 	Norway 	Denmark 
GDP (US\$ in millions) (2016)	2,263,792	371,068	346,119
GNI per capita (2016)	1,670	81,980	56,990
HDI ranking (0–1, where 1 is high)	0.624 (131 st in the world)	0.941 (1 st in the world)	0.925 (5 th in the world)
Country classification	LEU	HIC	HIC

2. Read the information above and highlight/underline the important data before answering the questions below.
- Which country has the highest GDP?
 - Which country has the highest GNI per capita?
 - Which country has the highest HDI ranking?
 - Why do you think singular economic measurements of developments such as GDP is not always the best way to measure development? Explain your answer fully using data from the table above.

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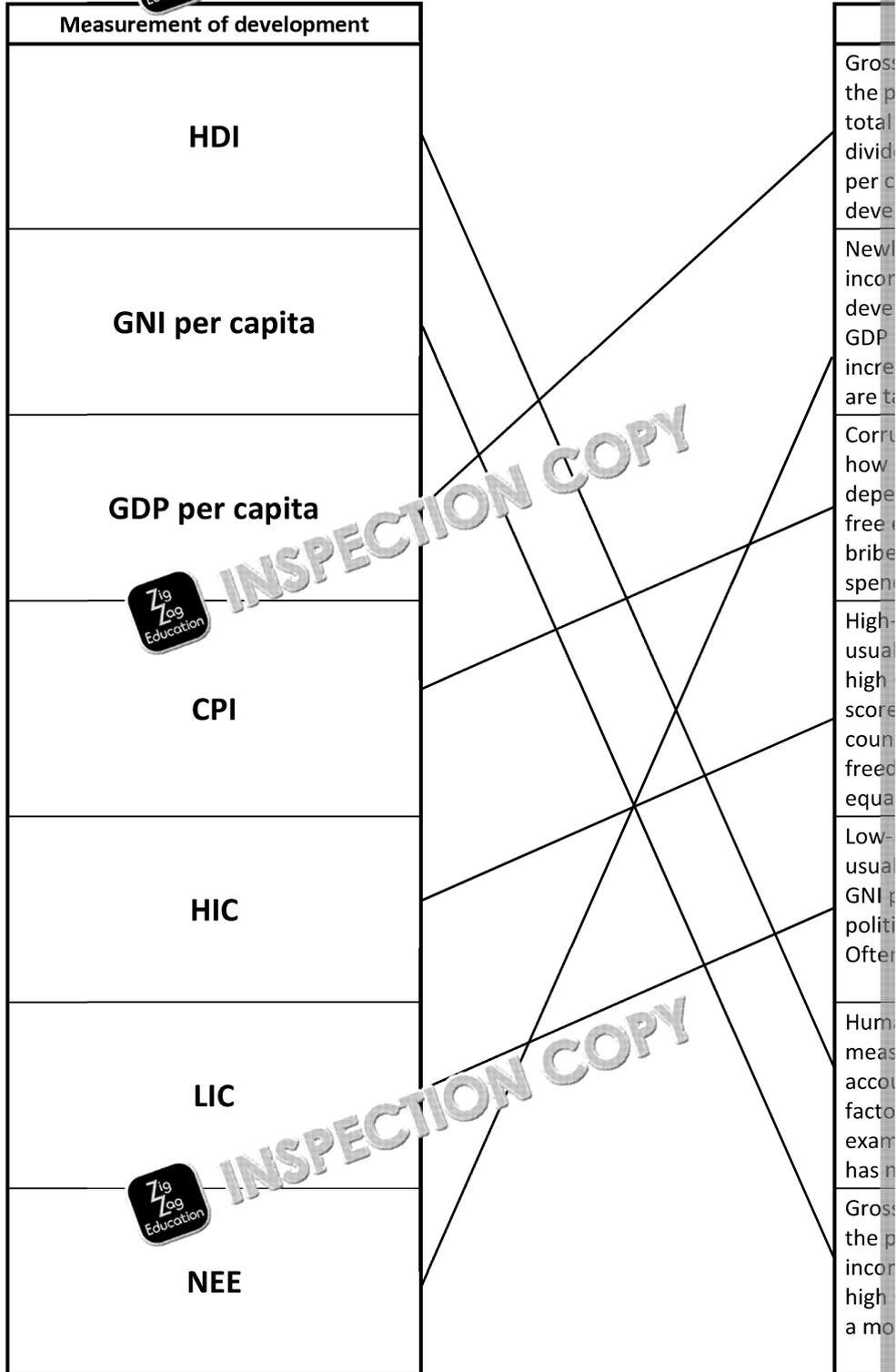
Lesson 1 Answers

Task 1

Answers may include but are not limited to:

- Economic – fair living wages (also a social factor), high GNI per capita, economic investment in healthcare and education, FDI (foreign direct investment)
- Social – accessible and affordable healthcare, good level of accessible education, abolition of slavery, quality of life, good standard of living, access to clean water and stable food supply
- Political – no government corruption, freedom of speech / free press, no war / armed conflict
- Environmental – clean air, clean water, limited land pollution, measures in place to manage energy development

Task 2



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2. a) India
- b) Switzerland
- c) Norway
- d) As the data shows, India has the highest GDP but is considered an emerging country. Developed countries such as Norway, Denmark and Switzerland have lower GDP. In consideration of composite factors such as HDI, they rank much higher than India. India has a high GDP but low levels of social, political and socio-economic development, as these factors are not the only factors that need to be taken into consideration when comparing countries. Economic and social factors (as represented in the HDI) are also important indicators of development.

Task 3

1. They are largely found in Africa, especially sub-Saharan Africa. A few mid-range GNIs are found in East Asia and South America.
2. This is where the most developing countries / LICs / LDCs are

Task 4

1. and 2.

Which country has the highest/lowest figure for the following factors?	Highest
Life expectancy	Australia ↑
Birth rate	Zambia ↓
Literacy rate	Australia and Canada ↑
Infant mortality rate	Zambia ↓

- 3.

HIC	LMIC	LIC
Australia	Brazil	Bangladesh
Canada	Kenya	Zambia

4. Developed countries tend to have high life expectancies, high literacy rates and low infant mortality rates. Australia and Canada have these demographic factors, so they are categorised as developed countries. Developing countries tend to have low life expectancies, high infant mortality rates and higher birth rates, as well as lower literacy rates. These factors are a fit with Bangladesh and Zambia. Emerging countries may exhibit factors that are a mix of developed and developing countries, such as higher life expectancies than developing countries but lower literacy rates than developed countries.
5. One would expect that a high death rate would be an indicator of a developing country. Developing countries tend to have very young populations, so the death rate is often high (due to infant mortality). On a similar note, developed countries often have ageing populations (due to a higher, or close to the birth rate. However, countries experiencing epidemics of disease (such as countries with limited healthcare) may see sharp rises in death rates. These factors are indicators of development.

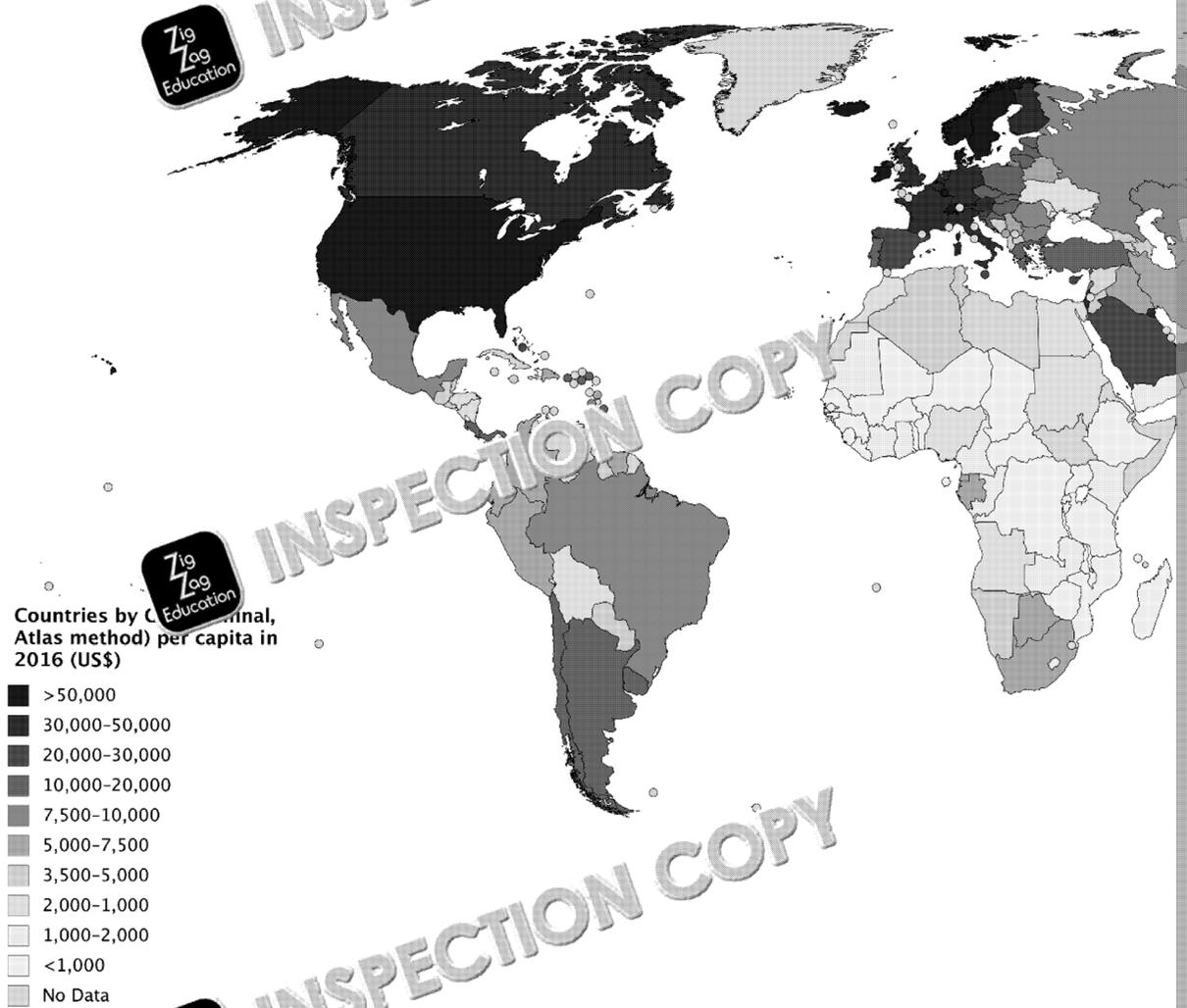
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Task 1



Spend a few minutes studying the map for GNI per capita (2016).

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1. What do you notice about the global distribution of countries with low GNI p

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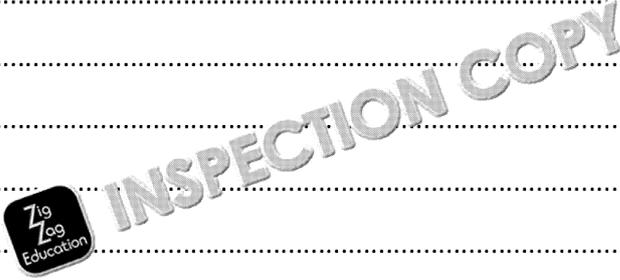
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2. Why do you think this is?

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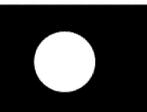


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Task 2

Spend a few minutes studying the table of demographic data before completing the task.

Country	Life expectancy (average age people are expected to naturally live)	Literacy rate (percentage of the population over the age of 15 who can read and write)	Birth rate (number of babies born alive per thousand people per year)	Death rate (number of deaths per thousand people per year)
Australia 	82.3	99%	12.1	7.3
Bangladesh 	73.4	72.8%	18.8	5.4
Brazil 	74	92.6%	14.1	6.7
Canada 	81.9	99%	10.3	8.7
Kenya 	64.3	78%	23.9	6.7
Zambia 	52.7	63.4%	41.5	12.2

- Fill in the table stating which country has the highest and which has the lowest demographic factors.

Which country has the highest/lowest figure for the following factors?	Highest	
Life expectancy		
Birth rate		
Literacy rate		
Infant mortality rate		

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- 2. On the table you have just filled in, state whether you think the data shows a high level of development by drawing an upwards-facing arrow (↑) or a low level of development by drawing a downwards-facing arrow (↓).
- 3. Sort the countries into the country development classification categories based on the data from questions 1 and 2.

HIC	Country	Development Level

- 4. Why did you categorise each country in the way you did for question 3? Explain your answer using evidence from the data from the demographic data table.

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- 5. Why do you think death rate is a complicated indicator of development?

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Physical distinctions of the UK (I)

	Description
Task 1	Introducing relief maps and impacts on human populations in the UK
Task 2	Introducing land use in the UK

In this lesson you will:

- ✓ learn about the UK's relief
- ✓ learn about the UK's climate

Task 1



In geography, the term 'relief' refers to the height of the land relative to its surrounding elevation points and low elevation points. Below are a map of the UK's relief and a map of the UK's climate. Study the two maps for a few minutes before answering the questions that follow.



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1. Briefly outline where the areas of high elevation and low elevation are located.

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2. Powys, in Wales, has the among the lowest population density in the UK and London contains the UK's capital, the City of London, and is a largely urban area. How do these factors affect whether an area is large or small?

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3. Elevation causes other elements of physical geography, such as rainfall, sea level and land. This can often cause issues for the land or the local people who live there. Show some of the main issues that areas of high elevation and areas of low elevation face.

High elevation	Low elevation
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Task 2

The Office for National Statistics (ONS) outlines seven types of land use according to the System of Economic-Environmental Accounting (SEEA):

1. Agriculture
2. Forestry
3. Aquaculture
4. Built-up and related areas
5. Maintenance and restoration of environmental functions
6. Not classified
7. Land not in use

1. Sort the following photos of land use in the UK into the categories from the SEEA.



Eaton Park, Norwich



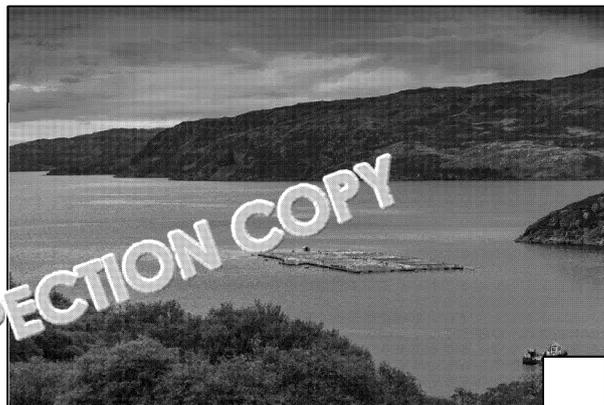
Marazion, Cornwall



Hustwaite, Yorkshire



Roydon Wood, Essex



Assynt Peninsula, Scotland

2. Think about where you live. Create a poster outlining some of the land uses in your area to include examples of the seven categories of land use outlined by the SEEA. Use simple sketches and annotate them to show land use.

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Physical distinctions of the UK (I) answers

Task 1

1. High-elevation areas include: Highlands in Scotland, Cumbria, parts of Devon, mid W

Low-elevation areas include: Norfolk, Greater London, Cambridgeshire.

2. Urban areas tend to be built on areas of low relief whereas rural areas tend to be found in high-relief areas. This is because often in high-relief areas the topography is mountainous, rocky and unusual relief are found at the base of drainage basins; historically people built settlements on (from rivers) and land that is relatively flat to build on.

3. High elevation differences in temperature as elevation increases (temperature decreases). Rainfall will depend on the catchment area and whether an area is on a windward slope. This affects crops and agriculture if humans utilise the land in these areas.

Low elevation: risk of flooding; people more likely to live in areas of low elevation – (due to environment). Climate change is causing sea level rise; areas of low elevation by the coast are at risk of flooding from sea level rise.

Task 2

- Norfolk – 4. Built-up area
 - Cornwall – 5. Maintenance and restoration
 - Yorkshire – 1. Agriculture
 - New Forest – 2. Forestry
 - Scotland – 3. Aquaculture

2. Posters will vary depending on region and student

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Physical distinctions of the UK (II)

	Description
Task 1	How physical land relates to human population, case study of Ebbw Vale

In this lesson you will:

- ✓ learn how the UK's physical geography relates to the UK's population through a case study

Task 1

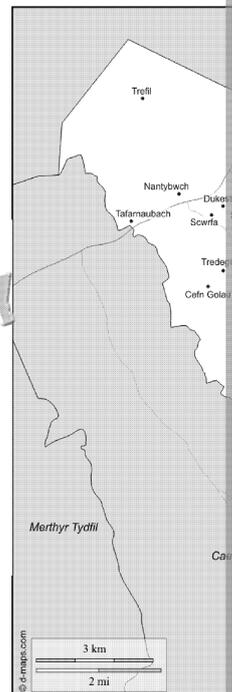
Read the case study carefully and then answer the questions that follow.

Case Study: Ebbw Vale

Ebbw Vale (pronounced 'ebb-bah vay-al') is a town in the Welsh county of Blaenau Gwent. The town's land use became heavily industrialised in the 1930s and 1940s when steelworks and ironworks in the area were in high production. Numerous people were employed by the metalworking industry, which helped the local economy. After the 1970s and 1980s, the region saw a decline in industry, largely due to manufacturing companies sourcing cheaper metal from abroad. This led to deindustrialisation in the area and caused many people to lose their jobs. There were concerns over the environment that highly industrial mining had on the environment in the area, causing a lot of the land to become degraded and derelict.

Ebbw Vale is situated in a geological area of largely sedimentary rock. This means the region has the perfect geology for iron ore deposits. Iron is a metal that can be made into the alloy steel. Steel is widely used in industrial construction as it is very strong and durable. Ebbw Vale is situated in a valley (an area of low relief), and most of the mines in the town were built at the base of the valley. However, the process of mining often caused many landslides at the sides of the valley.

Since the deindustrialisation of Ebbw Vale, the town has undergone significant regeneration. This includes the building of a learning centre, a college, a hospital and a leisure centre. There are also plans in place for new housing in the area. There is a railway station which connects the town to the wider area, including Wales's capital city, Cardiff, which has transport links to the rest of the UK.



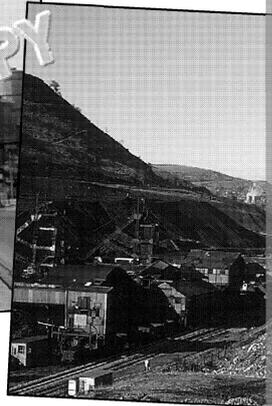
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Ebbw Vale steelworks in the late 1960s



Ebbw Vale



Ebbw Vale railway station



Ebbw V



Blaenau Gwent College

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1. How did Ebbw Vale's physical geography affect the development of its land use?

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2. How did industrialisation affect the physical environment of Ebbw Vale?

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3. How has land use changed in Ebbw Vale in recent years?

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4. To what extent is having a railway station important for the people living in Ebbw Vale?

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5. Regeneration has brought new facilities to Ebbw Vale. What are they, and what has been done with the land for the people of Ebbw Vale?

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Physical distinctions of the UK (II) answers

Task 1

1. The geology helped the form iron ore, which was exploited by humans to create a m
2. Land, air and water pollution (as was common with all industrialisation at the time), l
dereliction and the wider impacts from industrialisation, such as climate change.
3. From built-up/industrialised to decline (land not in use) to redeveloped (built up again
residential, commercial).
4. Railway allows for connections to the rest of Wales / the UK – social (leisure, family, fr
5. Housing, education, leisure facilities and a hospital – core amenities for locals; suppo



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What are natural resources? (I)

	Description
Task 1	Introduction to resources and the principle of resource security
Task 2	Introduction to food

In this lesson you will:

- ✓ be introduced to the idea of resource security
- ✓ be introduced to resource security

Task 1

A natural resource is something made from natural sources that humans use in our everyday lives. Common examples are energy, water and food (there are also mineral resources but we will probably be focused on more at A Level). One of the biggest issues with resource security is the principle that a country (or region or state) has enough of a resource to meet its needs (usually with a surplus in case of emergencies).

1. Imagine you and three friends are going camping for a weekend. You will need to take enough food for the four of you, enough water to drink and enough fuel to keep the campfire going so you can keep warm and cook food. There is a chance that some more friends will be joining you on the Sunday, but you are not sure whether or not they will have their own supplies. There probably will not be enough in your original stock to feed everyone. You will need to give everyone water, and you will probably need to set up another campfire.

a) What do you need to ensure that there are enough supplies to go round, even if more friends join you on the trip?

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b) How do you think this scenario relates to resource security?

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Another issue with resources is having too much or too little of the resource. Too much resource surplus and too little is called a deficit. When resources are in surplus, there is resource security. However, when there is a deficit, this is said to be resource insecurity.

2. Going back to your imaginary camping trip, what do you think would happen if there was a resource deficit?

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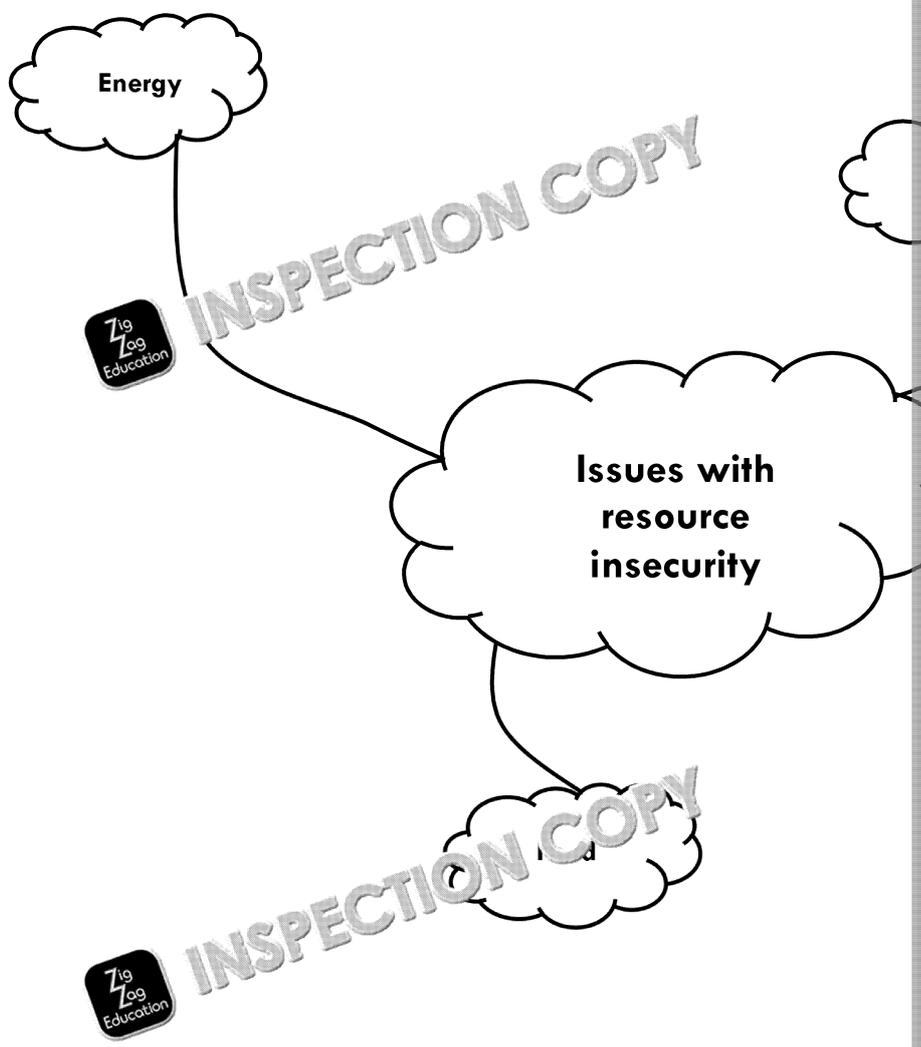
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3. What do you think are some of the issues with resource deficit/insecurity around the world? Draw a mind map to show your thoughts on the following issues regarding this question:

- Issues with food insecurity
- Issues with water insecurity
- Issues with energy insecurity
- Whether this affects developed/developing countries in different ways



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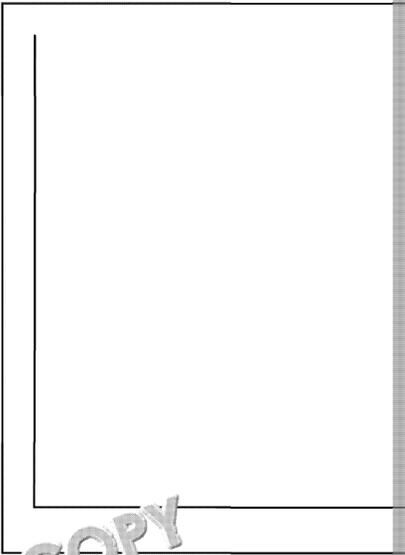


Task 2

We all eat different types of food and we have our personal preferences on what there is a common link between us – we all need food to survive. In an ideal world crops to make food and grow just enough to feed ourselves the amount we need how the world works, and food insecurity is one of the biggest problems on the planet.

In the late 1700s, British demographer and economist Thomas Malthus suggested that human population was going to grow geometrically (doubling in size every year) but that food production would grow arithmetically (at a steady, linear rate). At a point where he argued that human population would exceed food production, hence this phenomenon is often called a Malthusian trap.

Year	Human population	Food production
1	1	1
2	2	2
3	4	3
4	8	4
5	16	5
6	32	6
7	64	7
8	128	8
Etc.	continues geometrically	continues arithmetically



1. In the box provided, draw a graph which of what you think the Malthusian trap looks like.

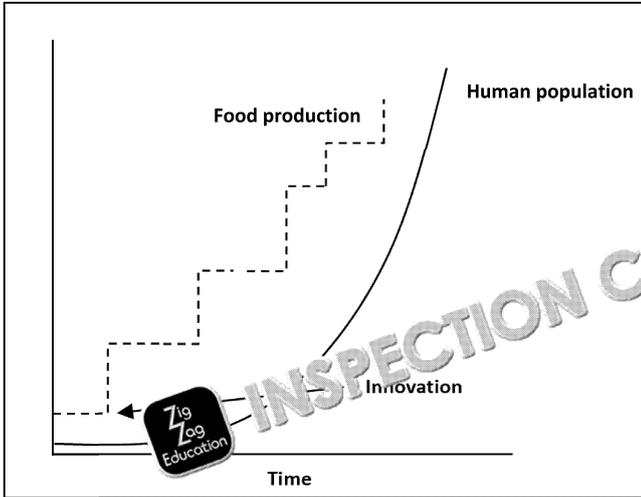
Some people disagreed with Malthus' theory and suggested that humans would innovate with the increasing population. One of these people was Danish economist Esterlin who argued that humans will develop new technologies in order to increase food production as population increases. She argued that humans will continue to innovate new methods as improved irrigation of crops, automated production and new scientific methods.

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To the left is a sketch of a theory of population and

2. How does this graph sketched for question

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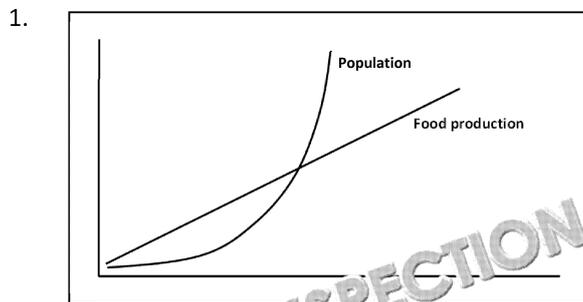


What are natural resources? (I) answers

Task 1

- Take extra supplies to begin with as backup; distribute supplies evenly and fairly as you need to.
 - Food, water and energy are all essential resources. The extra friends may represent a population that increases but the resource supply stays the same, then the supplies cannot support the population. This scenario shows how important it is to have resources.
- If the resources were in demand, there would not be enough to supply everyone with warmth and to cook. This would result in people being thirsty, hungry and cold.
- Food insecurity** – hunger / famine / malnutrition / premature deaths; more likely in developing countries (although poverty / socio-economic deprivation in developed countries can lead to hunger/malnutrition)
 - Water insecurity** – malnutrition/famine/drought/disease due to reliance on dirty water (cholera) are more prevalent in developing countries without clean water and land
 - Energy insecurity** – famine (especially if there is a reliance on artificial irrigation (especially due to lack of infrastructure development), geopolitical tensions (especially in other states)

Task 2



The graph you should draw should look something like this. (Straight diagonal line for population that intersects the straight line for food production.)

- The food production line grows at a constant rate as it incorporates technological improvements. The food production line never intersects the population line, which continues to grow geometrically.

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