



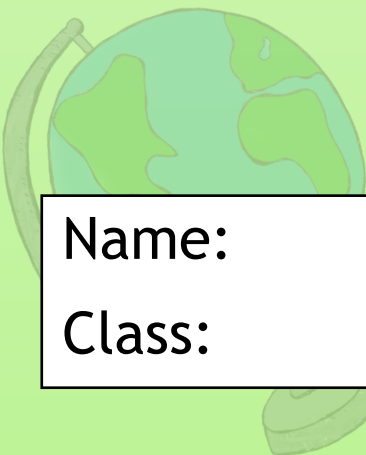
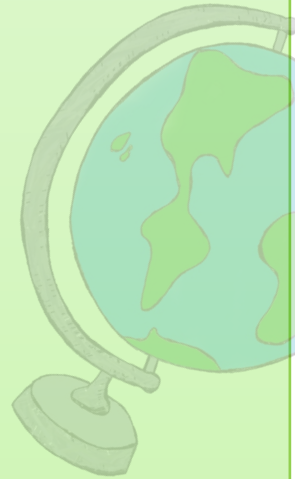
GCSE GEOGRAPHY

EXAMPLES AND CASE STUDY EXAM PRACTICE

PAPER 1



Aim for Excellence



Name:

Class:

Teacher:

Use this Page to understand the ‘command words’

Too many people miss out on marks because they did not understand what the question was asking them to do. Make sure you know what your command words mean. These are the words that tell you what to do.

Command word	Typical no. of marks	What the command word means	Example of a question
Identify/State/Name	1	Find (e.g. on a photo), or give a simple word or statement	Identify the landform in the photo
Define	1	Give a clear meaning	Define the term ‘fertility rate’
Calculate	1 or 2	Work out	Calculate the mean depth of the river shown in Figure 2
Label	1 or 2	Print the name of, or write, on a map or diagram	Label two features of the cliff in Figure 4
Draw	1, 2 or 3	As in sketch or draw a line	Draw a line to complete the graph in Figure 3
Compare	2 or 4	Identify similarities or differences	(referring to a graph) Compare the rate of population growth in city X with city Y.
Describe	2 or 4	Say what something is like; identify trends (e.g. on a graph)	Describe the trend shown in Figure 1
Explain	2, 4, 6 or even 9	Give reasons why something happens	Using examples, explain the rapid growth of a mega-city you have studied
Suggest	2 or 4	In an unfamiliar situation (e.g. a photo or graph), explain how or why something might occur, with a reason	Suggest reasons for the increase shown in the graph
Examine	6 or 9	Give reasons for, but also begin to judge which of the reasons is more important	Examine the reasons for the growth of one mega-city you have studied
To what extent ...	6 or 9	Show how far you agree or disagree with a statement	To what extent do mega-cities offer a better lifestyle for migrants than the rural areas they have left?
Assess	6 or 9	Weigh up which is most/least important	Assess the need for coastal management along a stretch of coast you have studied
Evaluate	6 or 9	Make judgements about which is most or least effective	Evaluate the methods used in collecting data in your fieldwork
Discuss	6 or 9	Give an overview of a situation or a topic where there are different approaches or viewpoints	Discuss the ways in which climate change could be managed
Justify	6 or 9	Give reasons why you support a particular decision or opinion	Justify the reasons for your choice

Paper 1: Living with the physical environment

Section A - The challenge of natural hazards

Specification	Example/Case Study
Use named examples to show how the effects and responses to a tectonic hazard vary between two areas of contrasting levels of wealth	Nepal 2015 (LIC) and Chile 2010 (MIC/NEE)
Use a named example of a tropical storm to show its effects and responses	Typhoon Haiyan 2013
An example of a recent extreme weather event in the UK	Somerset Level Floods 2013/14

Section B - The living world

Specification	Example/Case Study
An example of a small-scale UK ecosystem	Woodland (Epping Forest, London)
A case study of a tropical rainforest	The Amazon Rainforest, Brazil
A case study of a cold environment	Svalbard

Section C - Physical landscapes in the UK

Specification	Example/Case Study
An example of a section of coastline in the UK	Dorset Coast, near Swanage, South East England.
An example of a coastal management scheme in the UK	Medmerry Coastal Management, West Sussex
An example of a river valley in the UK to identify its major landforms of erosion and deposition	River Tees
An example of a flood management scheme in the UK	Banbury Flood Storage Reservoir

Maule, Chile, (2010)

Background

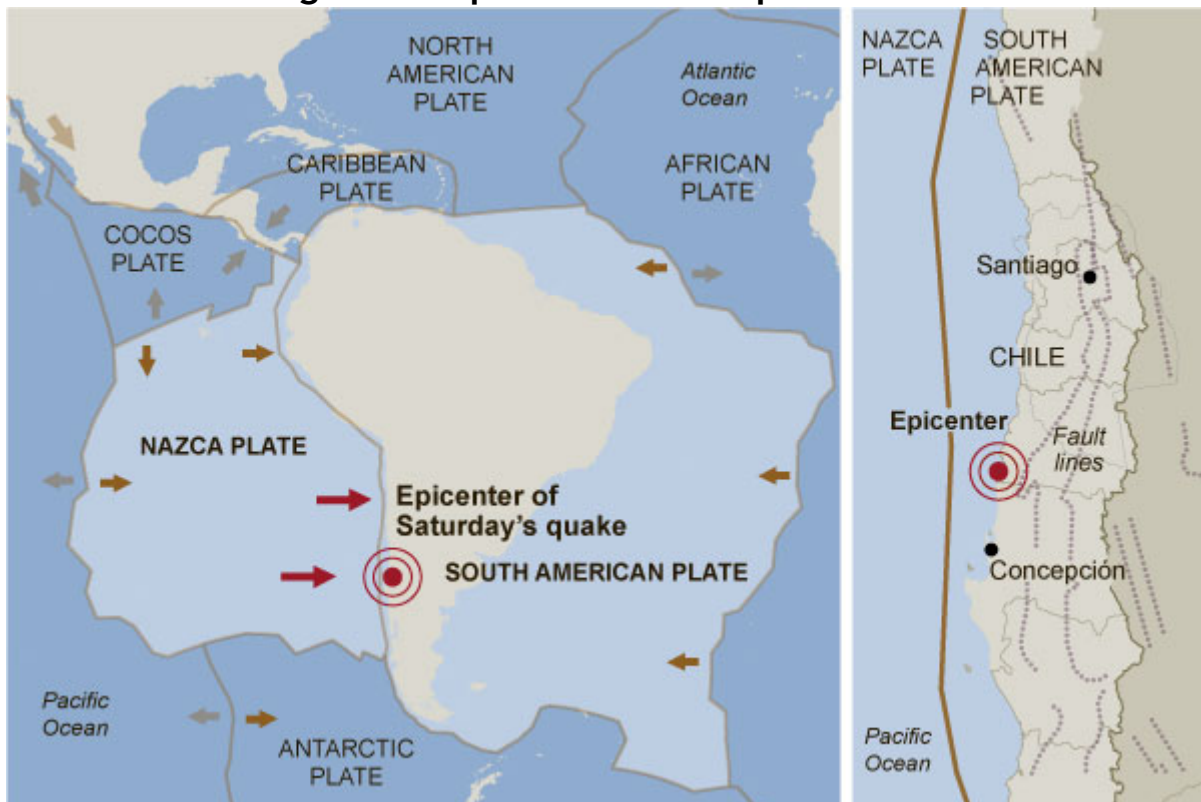
In global terms, Chile is ranked 38th out of 193 countries based on Gross Domestic Product (the country's wealth). It is ranked 41st out of 187 countries based on the Human Development Index (measure of wealth, health and education). Where a country is ranked 1st, this means they have the best out of the countries involved.

Causes

On 27th February 2010, the ground just off the coast of Central Chile shook for three minutes when a powerful magnitude 8.8 earthquake struck (Figure 2). The earthquake occurred at a destructive plate margin where the Nazca Plate is subducting (moving beneath) the South American Plate. It was followed by a series of aftershocks.

The earthquake occurred out to sea sending tsunami waves across the Pacific Ocean at speeds of 800km per hour.

Figure 2 Map of Chile Earthquake 2010



Primary Effects

- Around 500 people killed and 12 000 injured - 800 000 people were affected.
- 220 000 homes, 4500 schools, 53 ports and 56 hospitals were destroyed.
- Port of Talcahuano and Santiago airport was badly damaged.

- Much of Chile lost power, water supplies and communications.
- Cost of earthquake estimated at \$30billion US dollars.

Secondary Effects

- 1500km of roads damaged, mainly by landslides.
- Remote communities cut off by landslides for many days.
- Several coastal towns devastated by tsunami waves.
- A fire at a chemical plant near Santiago caused the area to be evacuated.

Immediate Responses

- Emergency services acted swiftly. International help was needed to supply field hospitals, satellite phones and floating bridges.
- Temporary repairs made to the important Route 5 north-south highway with 24 hours, enabling aid to be transported.
- Power and water restored to 90% of homes within 10 days.
- A national appeal raised \$60million US dollars - enough to build 30 000 small emergency shelters.

Long-term Responses

- A month after the earthquake Chile's government launched a reconstruction plan to help nearly 200 000 homes affected.
- Chile's strong economy based on copper exports could be rebuilt without the need for much foreign aid.
- President announced it could take up to four years for Chile to recover fully from the damage to buildings and ports.



Gorka, Nepal, (2015)

Background

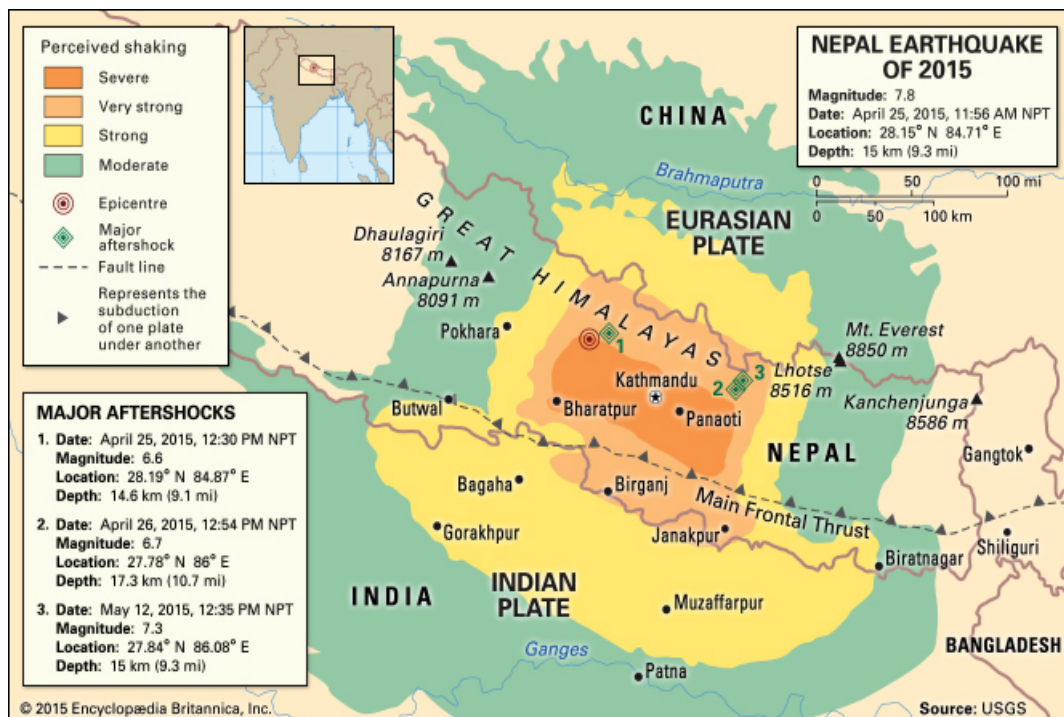
In global terms, Nepal is ranked 109th out of 193 countries based on Gross Domestic Product (the country's wealth). It is ranked 145th out of 187 countries based on the Human Development Index (measure of wealth, health and education). Where a country is ranked 1st, this means they have the best out of the countries involved.

Causes

On 25th April 2015 Nepal was struck by a magnitude 7.9 earthquake on the Richter scale. The epicentre was about 80km (50 miles) to the north west of Nepal's capital Kathmandu in the foothills of the Himalayas (Figure 1). This is a destructive plate margin where the Indo-Australian Plate is colliding with the Eurasian Plate at a rate of 45mm per year. The collision and pressure at this margin is responsible for the formation of the Himalayas.

The earthquake was very shallow, just 15km below the surface. This resulted in very severe ground shaking and widespread landslides on the Himalayas and avalanches on Mount Everest. The earthquake caused damaged hundreds of kilometres away in neighbouring India, Tibet and Pakistan. There were three notable aftershocks of M6.6, M6.7 and M7.3 (Figure 1).

Figure 1 Hazard Map of Nepal, 2015



Primary Effects

- 9000 people died, and 20 000 people were injured - A total of 8 million (1/3 of Nepal's population) were affected).

- Electricity, water supplies, sanitation and communication affected.
- 1.4 million people needed food, water and shelter days after the earthquake.
- 7000 schools and 500 000 homes destroyed, and hospitals were overwhelmed.
- International airport became congested as aid arrived.
- 50% of shops were destroyed affecting food supplies and people's livelihoods (income).
- Cost of damage was estimated to be over \$5billion US dollars.

Secondary Effects

- 3 million people left homeless when homes were destroyed.
- Ground shaking triggered landslides and avalanches, blocking roads and delaying rescue efforts.
- Avalanches on Mount Everest killed at least 19 people - the greatest loss of life on a mountain in a single incident.
- An avalanche in the Langtang region left 250 people missing.
- Landslides blocked the Kali Gandaki River causing people to be evacuated in case of flooding.
- Reduced tourism from Mount Everest and the Dharahara Tower; a world heritage site which was damaged caused a decline in employment and income.

Immediate Responses

- International help was requested.
- Search and rescue teams, water and medical support arrived quickly from countries such as UK, India and China.
- Helicopters rescued people on Mount Everest and delivered supplies to villages cut off by landslides.
- 500 000 tents were provided.
- Field hospitals were set up and the United Nations and World Health Organisation sent medical supplies to badly affected areas.
- Facebook launched a safety feature allowing users to indicate they were safe. Free telephone calls.
- 300 000 migrated from Kathmandu to seek shelter and supplies.

Long-term Responses

- Roads were repaired, and landslides were cleared. Lakes, formed by landslides damming river valleys need to be emptied to avoid floods.
- Stricter laws on buildings codes.
- New trekking routes opened on Mount Everest and permits were extended by 2 years.

Exam Practice

Suggest why the effects of a tectonic hazard vary between areas of contrasting levels of wealth.

[6 marks]

Point:
One in which the effects vary is...

(give examples of primary and secondary effects, why are primary effects different in richer and poorer countries?)

Point:
One in which the effects vary is...

(give examples of primary and secondary effects, why are primary effects different in richer and poorer countries?)

Using two named examples, evaluate the effectiveness of the immediate and long-term responses to a tectonic hazard in two countries of contrasting wealth.
[9 + 3 SPaG marks]

Introduction:
Introduce your two examples of a natural hazard.

Point:
Immediate and long-term responses were successful in a rich country.

(what were they? How did they help to reduce the effects? What were the effects?)

Counterargument:
Immediate and long-term responses were not as successful in a poor country.

(what were they? How did/didn't they help to reduce the effects? What were the effects?)

Conclusion:
Your overall opinion linking back to the exam question.

Choose **either** an earthquake **or** a volcanic eruption.
Assess the extent to which primary effects are more significant than secondary effects.
[9 + 3 SPaG marks]

Introduction:
Introduce your two examples of a natural hazard. State what primary and secondary effects are.

Point:
Primary effects are more significant than secondary effects.

(give examples of primary and secondary effects, why are primary effects worse?)

Counterargument:
secondary effects are more significant than primary effects.

(give examples of primary and secondary effects, why are secondary effects worse?)

Conclusion:
Your overall opinion linking back to the exam question.

Typhoon Haiyan, Philippines, 2013

Causes

Typhoon Haiyan struck the Philippines, South East Asia on the 8th November 2013. It was a category 5 storm on the Saffir-Simpson scale. It was one of the most powerful storms to ever hit the Philippines.

The tropical storm brought winds of up to 314 kilometres per hour, waves as high as 15 metres and 400 millimetres of heavy precipitation flooding 1km inland from the coast. 90% of the city of Tacloban was destroyed.

Primary Effects

Social

- 50% of houses destroyed.
- 4.1 million made homeless.
- 6,190 people died.

Economic

- Damage cost was \$12 billion US dollars.
- Damage to rice cost \$53 million US dollars.
- The United Nations stated 75% of farmers and fishermen had lost their income.

Environmental

- An oil barge ran aground causing an 800 000-litre oil spill.
- 400 millimetres of rainfall caused flooding.
- 1.1 million tonnes of crops were destroyed.

Secondary Effects

Social

- Infection and disease spread due to contaminated water.
- Eight deaths in a stampede as survivors fought for rice supplies.
- Power supplies were cut off for a month in some areas.
- Many schools were destroyed.

Economic

- Fishing industry was disrupted as the leaked oil from the grounded barge contaminated fishing water.
- The airport was badly damaged, and roads were blocked by trees and debris.
- Looting and violence was rife in Tacloban, due to a lack of food and supplies.
- By 2014, rice prices had risen by nearly 12%.

Environmental

- Ten hectares of mangroves (saltwater-adapted trees or shrubs) were contaminated by the oil barge leak.
- Flooding caused landslides.

Immediate Responses

- The government televised a warning for people to prepare and evacuate.
- Authorities evacuated 800 000 people. Many went to Tacloban Indoor Stadium, which had a reinforced roof to withstand typhoon winds, however, it flooded.
- Over 1 200 evacuation centres were set up to help the homeless.
- The Philippine government ensured essential equipment and medical supplies were sent out, but in one region medical supplies and equipment was washed away.
- Emergency aid supplies arrived three days later by plane. Within two weeks, over 1 million food packs and 250 000 litres of water was distributed.
- The government imposed a curfew two days after the typhoon to reduce looting.
- The Beckhams celebrity couple, X Factor TV show and brands such as Coca-Cola, FIFA and apple used their status to raise awareness and encourage public donations.

Long-term Responses

- Thirty-three countries and international organisations pledged help. More than \$1.5billion US dollars was pledged in foreign aid.
- A 'cash for work' programme paid people to clear up the debris and rebuild the city.
- Oxfam replaced many fishing boats.
- In July 2014, the Philippine government declared a long-term recovery plan 'Build Back Better'. Buildings would not just be rebuilt but upgraded to protect against future disasters.
- A 'no build zone' was established in the Eastern Visayas. Homes were rebuilt away from flood-risk areas.
- Mangroves were replanted.
- A new storm surge warning system was installed.
- More cyclone shelters were built.



Exam Practice

Using an example of a tropical storm that you have studied, discuss the immediate and long-term responses to reduce its affects.

[6 marks]

Point:
One immediate response which reduced the effects was...

(give examples of responses and explain how it reduced the primary and secondary effects.)

Point:
One long-term response which reduced the effects was...

(give examples of responses and explain how it reduced the primary and secondary effects.)

Assess the extent to which prediction is the most important factor in reducing the effects of tropical storms.

[9 + 3 SPaG marks]

Introduction:
What is your tropical storm and how can they be predicted?

Point:
Outline how prediction could be the most important factor in reducing the effects of a TS. Use case studies as evidence.

Counterpoint
Outline how other factors (planning and preparation) could be more importance than prediction. Use case studies as evidence.

Conclusion:
Your overall opinion linking back to the exam question.

Using a named example, evaluate the immediate and long-term responses to tropical storms

[9 + 3 SPaG marks]

Introduction:
What is your tropical storm?
What are immediate and long-term responses?

Paragraph 1 -
Introduce your case study.
Discuss the immediate responses. State how effective these responses were. Refer to facts, stats and specific from your case study.

Paragraph 2 -
Discuss the long-term responses. State how effective these responses were. Refer to facts, stats and specific from your case study.

Conclusion:
Your overall opinion linking back to the exam question.

Somerset Levels Floods, Dec 2013 - Jan 2014

Cause

Several depressions (low air pressure systems) moving across the Atlantic Ocean caused weeks of wet weather. These systems were picked up by the Polar Jet Stream which was situated more south than usual and directed towards the west of England. It was the wettest January on record and heavy precipitation saturated soils. High tides and storm surges came up the rivers from Bristol Channel. Rivers were not dredged for over twenty years which meant that sediment had built up on the river bed. This caused a reduction in the capacity of water the rivers could hold. As a result, they burst their banks.

Social Impacts

- More than 600 homes were flooded.
- Sixteen farms were evacuated.
- Temporary accommodation for residents was needed for several months.
- Some villages were cut off.
- Power supplies were disrupted.

Economic Impacts

- Over 14 000 hectares of agriculture land flooded for weeks.
- Over 1 000 livestock were evacuated.
- Roads were cut off.
- Railway lines were closed.
- £10 million damage cost.

Environmental Impacts

- Rivers were contaminated with sewage, oils and chemicals.
- Debris was deposited across the land.
- Stagnant water had to be reoxygenated and pumped back into rivers.

Management Strategies to Reduce Risk

- River banks were raised and strengthened.
- Somerset County Council pledged £20 million on a Flood Action Plan.
- Rivers Tone and Parratt were dredged in March 2014.
- Road levels were raised.
- Flood defences for communities at risk.
- Pumping stations were built.
- By 2024, there is potential for a tidal barrage.

Exam Practice

The weather of the UK is becoming more extreme.’
Use evidence to support this statement.

[6 marks]

Paragraph 1:
Outline how
weather is
becoming more
extreme in the UK
- support with
evidence

Counterargument:
The weather isn't
becoming more
extreme - e.g.
recording is more
sophisticated

Conclusion:
Your overall
opinion linking
back to the exam
question.

Using an example of a recent extreme weather event in the UK, to what extent were the economic effects more significant than the social effects?
[9 + 3 SPaG marks]

Introduction:
What is your tropical storm?
What are social and economic effects?

Paragraph 1 -
The economic effects were worse than the social effects.

(Give examples and explain how they were worse.)

Counterargument -
The social effects were worse than the economic effect.

(Give examples and explain how they were worse.)

Conclusion:
Your overall opinion linking back to the exam question.

Discuss to what extent climate change is responsible for extreme weather in the UK.
[6 marks]

Paragraph 1:
Outline how weather is becoming more extreme in the UK - support with evidence. Link this to climate change.

Counterargument:
The weather isn't becoming more extreme - e.g. recording is more sophisticated. It has nothing to do with climate change.

Conclusion:
Your overall opinion linking back to the exam question.

Using an example of a recent extreme weather event in the UK, assess whether the socio-economic effects were more important than the environmental effects.
[9 + 3 SPaG marks]

Introduction:
What is your tropical storm?
What are socio-economic and environmental effects?

Paragraph 1 -

The socio-economic effects were worse than the environmental effects.

(Give examples and explain how they were worse.)

Counterargument -

The environmental effects were worse than the socio-economic effect.

(Give examples and explain how they were worse.)

Conclusion:
Your overall opinion linking back to the exam question.

Epping Forest, East London, UK

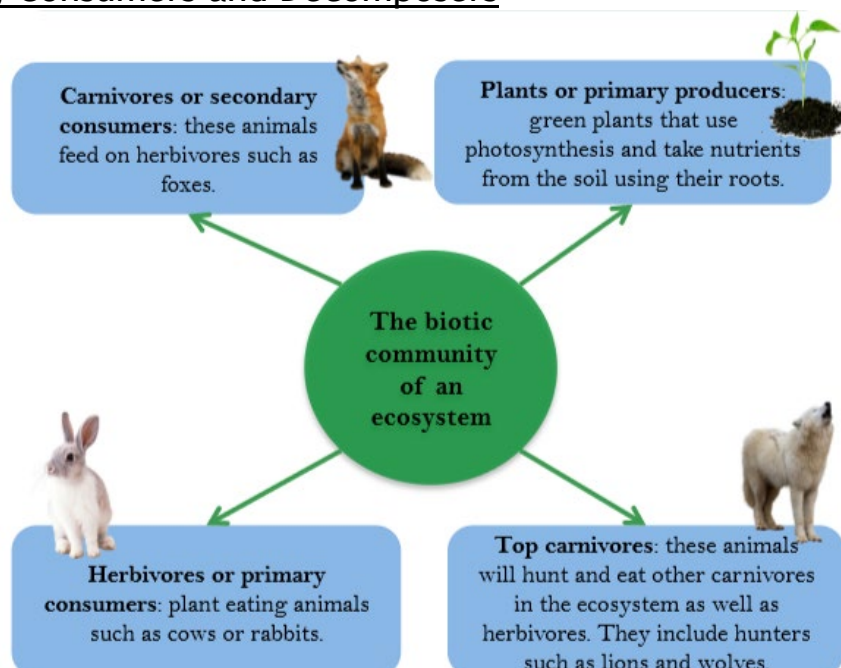
Location

Epping Forest is located in North East London and is an ancient deciduous woodland. It has many native trees including oak, ash, elm and beech. There is a lower shrub layer of grasses, brambles and bracken that form the main producers in the ecosystem. There are many birds, mammals, amphibians and insects which are the consumers. Over 700 species of fungi act as important decomposers for the ecosystem.

Interrelationships in the Ecosystem

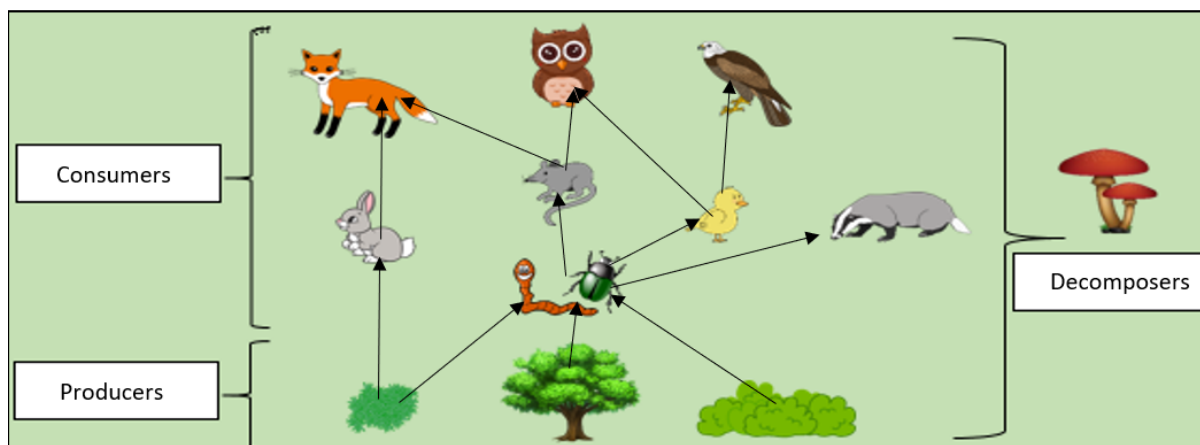
Season	Ecosystem Interrelationships: deciduous trees
Spring	Flowering bulbs such as bluebells make use of the sunlight penetrating through branches. The stored nutrients are used by the growing plants (producers) to produce fruit, berries and nuts that will feed consumers.
Summer	The broad tree leaves grow quickly in the Spring. With a large surface area, they maximise the Sun's energy to photosynthesise.
Autumn	To conserve energy and moisture, the trees shed their leaves. This is a direct response to the UK climate as the temperatures and sunlight hours decrease towards winter.
Winter	Bacteria and fungi decompose the leaf litter, releasing the nutrients into the soil.

Producers, Consumers and Decomposers



Food Chains and Food Webs

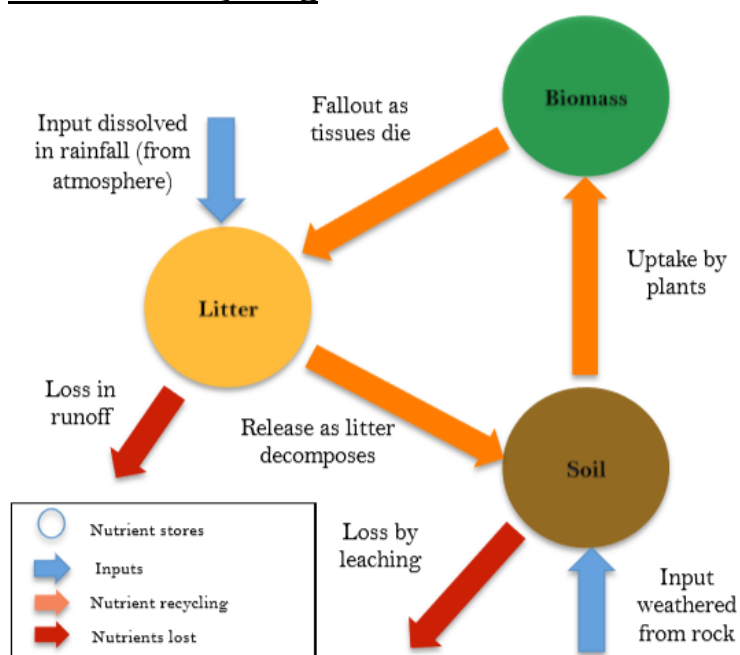
A food chain shows the direct links between organisms in an ecosystem, in the form of a line whereas a food web shows all the connections between organisms in an ecosystem. Below is an example of a food web for Epping Forest.



An example of a food chain would be:

Deciduous Tre → insects → small bird → sparrowhawk

Nutrient Recycling



The balance and interdependence between the components of the deciduous woodland ecosystem can be demonstrated by the nutrient cycling that takes place.

Inputs in to the ecosystem include weathered rock which forms soils, some of this soil is lost through leaching (rainwater washing the nutrients)

and some of the soil is taken up by plants (biomass). Biomass takes up the nutrients in the soil, when the biomass dies its tissue falls to the surface to form the litter. Decomposers break down the tissue in the litter and release organic matter back in to the soil where the nutrients can be taken up by biomass again. The cycle is continuous.

The Amazon Rainforest, Brazil, South America

Location

Tropical Rainforests are found in over 60 countries in the world. The Amazon Rainforest is in South America and covers 2.1 square miles of land across many different countries. If the Amazon Rainforest was a country, it would rank 9th in size. The greatest concentration of tropical rainforest in terms of biomass is in Brazil, Brazil has about 480 000 hectares of rainforest and is home to 60% of the Amazon Rainforest with neighbouring Peru home to 13% and Colombia; 10%. Venezuela, Ecuador, Bolivia, Guyana, Suriname and French Guiana have very small parts within their borders.

Biodiversity in the Amazon Rainforest

The Amazon Rainforest is home to 10% of the known species in the world. It has 205 species of birds, 40 000 plant species and 2.5 million insect species. There are approximately 3 000 fruits that grow in the rainforest that are edible. There are approximately 10 million species of animals, plants and insects known to man and more than half of them call the rainforest home. Many plants around the world have medicinal qualities. Of the plants known to have anti-cancer properties, 70% are found in the rainforest. Amazon natives use rainforest plants regularly but 90% of the ones they use have not been studied by modern science.

Causes of Deforestation in the Amazon Rainforest

In the last 100 years, the impact of deforestation on tropical rainforests has become serious. The United Nations Food and Agriculture Organisation (UNFAO) estimate that around half of the world's tropical rainforests have now been deforested.

The rate of deforestation has fallen in Brazil to a record low. It is estimated that around 50% of Brazil's remaining rainforest now has some form of protection status. However, 20% of the Amazon rainforest has now been cleared since 1970; that's an area of 761,000 km² (about three times the size of the UK).

There are several causes of deforestation in the Amazon. These are:

- Agriculture
- Logging
- Road Building
- Mineral Extraction
- Energy Development
- Settlement and Population Growth

Cause of Deforestation	Description
Agriculture	<p>Indigenous rainforest tribes practise subsistence farming. However, land is increasingly cleared for commercial farming - crop plantations and cattle grazing.</p> <p>In Brazil, cattle ranching accounts for 80% of deforestation. In Brazil, soybeans, palm oil and sugar cane (for biofuel) are major crops.</p>
Logging	<p>Logging is the first step in the conversion of forest land to other uses. This may seem surprising giving that logging only accounts for 3% of the causes of deforestation in Brazil. This is because it is the eventual use of the cleared land is put to that is recorded in the pie chart. Trees such as mahogany and teak are highly valued (selective logging) for furniture and other uses. Smaller trees are used for fuel, pulped or made in to charcoal. Vast amounts of the rainforest are cleared in one go (clear felling). There is also lots of illegal logging.</p>
Road Building	<p>Roads bring supplies and provide access to new mining areas, new settlements and new energy projects.</p> <p>In Brazil, the Trans-Amazonian Highway stretches for some 4 000 kilometres through the rainforest. This is accounted for in the 2% other category of the causes if deforestation in Brazil.</p>
Mineral Extraction	<p>Mineral extraction such as gold mining fall into the other category that accounts for 2% of the causes for deforestation in Brazil. In 1999, there were 10,000 hectares of land being used for gold mining. Today, there is over 50,000 hectares of land being used for gold mining. The rainforest also suffers from bauxite extraction which is used to make aluminium.</p>
Energy Development	<p>Also, included in the other category is energy development. An unlimited supply of water and ideal river conditions have encouraged dams to be built to generate hydroelectric power (HEP). This involves flooding vast amounts of rainforest. Often, the dams have a short life. In Brazil, the Belo Monte Dam will block the Xingu River flooding more than 40 500 hectares of land and displacing 15 000 people. The submerged forest eventually rots, making the water very acidic which then corrodes the HEP turbines. The dams also become blocked with soil washed down deforested slopes by the heavy rain.</p>
Settlement and Population Growth	<p>Population growth and migration to the area is also putting pressure on the Amazon rainforest, especially as the Brazilian government offers land in the rainforest to poor people from overcrowded cities. Many people migrate to the rainforest for work in the industries mentioned above. In turn, this means that land needs to be cleared to make way for settlements where workers and their families can live.</p>

Impacts of Deforestation in the Amazon Rainforest

There are many consequences or impacts of deforestation, whilst two are of global significance, the others are essentially local.

Impact of Deforestation	Description
Soil Erosion	Soil takes thousands of years to form, but it can be stripped away in a matter of hours. Removal of soil by wind and rain is called soil erosion. The roots of trees and plants bind the soil together. As soon as any part of the rainforest is cleared, the thin layer of topsoil is quickly removed by heavy rainfall. Bare slopes are prone to soil erosion. Once the topsoil has been removed, there is little hope of anything growing in that area again. Soil erosion also leads to the silting up of river courses. Even when the soil is protected, it quickly loses the little fertility it has when covered by trees. Grazing and plantations do little if anything to keep the soil fertile. The decline in soil fertility leads to pastures and plantations being abandoned, so more areas of the rainforest are cleared.
Loss of Biodiversity (Global)	Biodiversity is a measure of the variety of plants and animals in an ecosystem. Rainforest are the most biodiverse ecosystem in the world. Clearing tropical rainforests means that the biodiversity will be reduced, and individual species will become endangered and trees possible extinct. It has been estimated that 137 plant, animal and insect species are being lost each day due to deforestation. This amounts to 50,000 species each year. As the rainforest species disappear, so do many cures for life-threatening diseases. Currently, over 120 prescription drugs sold worldwide come from plant sources. 25% of the active ingredients in today's cancer-fighting drugs come from the organisms found only in the rainforest. Recent research has shown that the Amazon rainforest could lose between 30 and 45% of their main species by 2030.
Climate Change (Global)	Climate change is amongst the significant global impacts of deforestation in the rainforest. During photosynthesis, the tree canopy absorbs carbon dioxide (a greenhouse gas) in the atmosphere which reduces the rate of climate change. The Amazon stores around 100 billion tonnes of carbon. When the trees are felled, this stops, and more carbon dioxide remains in the atmosphere. Fire is often used to clear the rainforests, this means that the carbon stored in the wood is released back into the atmosphere where it will absorb heat and increase Earth's climate. Deforestation is responsible for at least 15% of global CO ₂ emissions each year - more than all the world's transport emissions combined. In addition, trees

	<p>give off moisture from the process of transpiration; deforestation reduces the moisture in the air resulting in a drier local climate. With less moisture comes less condensation and in turn rainfall. The natural recycling of water is like a cooling system, once the recycling is reduced (through less moisture) the local climate becomes warmer. Increasing dryness and rising temperatures are not good for people or activities such as agriculture.</p>
<p>Economic Development</p>	<p>Deforestation in many parts of the world is driven by profit. Deforestation may lead to short-term economic gains, but it may also lead to long-term economic losses. The natural rainforest has brought wealth to countries that were poor. Agriculture makes a lot of money in the rainforest. In 2008, Brazil made \$6.9 billion from trading cattle, Brazil is also the world's second biggest exporter of soy bean. The mining industry creates jobs for local people, for example the Buenaventura mining company in Peru employs over 3100 people. Logging contributes a huge amount to Brazil's economy. Companies will pay taxes to the government which can be used to improve public service such as education, healthcare and water supply. However, in the long-term, deforestation can destroy the resources that countries depend on such as timber and non-timber products, tourist numbers may also decline as the area reduces in attractiveness. The livelihoods of some local people are destroyed as deforestation can cause a loss of animals or plants that they rely on to make a living. For example, local Brazilian rubber tappers who extract natural rubber from rubber trees have lost their livelihoods as trees have been cut down.</p>



Economic Losses and Gains

Deforestation in many parts of the world is driven by profit. Deforestation may lead to short-term economic gains but it may also lead to long-term economic losses. The natural rainforest has brought wealth to countries that were poor. Agriculture makes a lot of money in the rainforest. In 2008, Brazil made \$6.9 billion from trading cattle, Brazil is also the world's second biggest exporter of soy bean. The mining industry creates jobs for local people, for example the Buenaventura mining company in Peru employs over 3100 people. Logging contributes a huge amount to Brazil's economy. Companies will pay taxes to the government which can be used to improve public service such as education, healthcare and water supply. However, in the long-term, deforestation can destroy the resources that countries depend on such as timber and non-timber products, tourist numbers may also decline as the area reduces in attractiveness. The livelihoods of some local people are destroyed as deforestation can cause a loss of animals or plants that they rely on to make a living. For example, local Brazilian rubber tappers who extract natural rubber from rubber trees have lost their livelihoods as trees have been cut down.

Justify why tropical rainforests should be protected.

[6 marks]

Paragraph 1:
Outline one reason why TR should be protected - how are they useful in their natural form?

What would happen if we damaged them?

Paragraph 2:
Outline another reason why TR should be protected - how are they useful in their natural form?

What would happen if we damaged them?

Conclusion:
Your overall opinion linking back to the exam question.

For a tropical rainforest you have studied, assess the extent to which deforestation benefits the people who live there.

[9 marks]

Introduction:
What is your tropical rainforest?

Paragraph 1 -
State a way people benefit and link this to short-term economic gains.
How do people benefit?

Counterargument -
State a way people do not benefit and link this to long-term economic losses.
How do people not benefit?

Conclusion:
Your overall opinion linking back to the exam question.

Use a case study of a tropical rainforest to assess the impact of deforestation.
[9 + 3 SPaG marks]

Introduction:
What is your tropical rainforest?

Paragraph 1 -
Outline a negative impact with examples of deforestation - explain why this bad.

Counterargument -
Outline a positive impact with examples of deforestation - explain why this good.

Conclusion:
Your overall opinion linking back to the exam question.

International co-operation is the only way to protect rainforests in the future.

Do you agree with this statement?

[6 marks]

Introduction:
What is your
tropical
rainforest?

Paragraph 1 -

Outline why you
agree with the
statement.

Provide evidence
of deforestation
and evidence of
international
cooperation.

Counterargument

Outline another
way rainforests
can be protected
in the future.

Give examples
and link to
sustainability.

Conclusion:

Your overall
opinion linking
back to the exam
question.

Svalbard, Norwegian Island, Arctic Ocean

Location

Svalbard is a Norwegian territory in the Arctic Ocean (northern hemisphere) and the most northerly permanently inhabited group of islands in the world. It has five major islands and a population of around 2700, most people live in Longyearbyen.

It has a polar climate with 60% of the land covered by glaciers. The rest of the land is tundra. There is no arable farming and no trees. It is too cold. More polar bears and snow mobiles than people.

Opportunities for Development

Opportunity for Development	Description
Mineral Extraction	<p>Svalbard has rich reserves of coal, but mining there is a controversial issue. Environment groups are against it as burning coal is a major source of greenhouse gases. However, coal mining is vital to the economy of Svalbard. It is the main economic activity. More than 300 people are employed in the mines and as support staff. In recent years, the industry declined due to low world coal prices and jobs were lost. Much of the coal is exported to Russia. A new coal mine opened near Svea in 2014.</p>
Energy	<p>Some of the coal mined on Svalbard is burned to generate electricity in the Longyearbyen power station. It is Norway's only coal-fired power station and supplies all of Svalbard's energy needs. Environmentalists believe the power station should close and renewable sources should be explored. The most likely future source being geothermal energy, tapping into the heat of the Earth and using it to generate electricity.</p> <p>Like Iceland, which uses geothermal energy, Svalbard is located close to the Mid-Atlantic Ridge, a constructive plate margin. Here the Earth's crust is thin and hot rocks are close to the surface.</p> <p>Another future option involves capturing carbon dioxide from burning coal and circulating this instead of water to generate electricity. This is known as Carbon Capture and Storage.</p>
Fishing	<p>The cold waters of the Barents Sea south of Svalbard are one of the richest fishing grounds in the world. Apart from cod, there are an estimated 150 species of fish here, including Herring and Haddock. These waters are extremely important breeding and nursery grounds for fish stocks and need to be protected from pollution.</p> <p>Fishing in the Barents Sea is jointly controlled and monitored by Norway and Russia to ensure that the fishing is sustainable, and the ecosystem is protected.</p>

Tourism	<p>Tourism in Svalbard has grown in recent years as people seek to explore extreme natural environments.</p> <p>In 2011, 70 000 people visited Longyearben and 30 000 of these were cruise passengers.</p> <p>The harbour at Longyearben was enlarged to allow for more cruise ships.</p> <p>Tourism provides around 300 jobs for locals.</p> <p>Most tourists come from Norway and most visit as part of organised tours.</p> <p>Tourists come to explore the extreme environment and see glaciers, wildlife, especially polar bears. Adventure tourism is becoming more popular with activities such as hiking, kayaking and snow mobile safaris.</p> <p>In the winter, tourists visit to see the Northern Lights.</p>
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Challenges that hinder Economic Development

Challenges for Development	Description
Extreme Temperatures	<p>Winter temperatures in Longyearben can fall below -30°C. In the Polar regions (north), it is even colder! This makes it extremely difficult and potentially dangerous to work outside, with a serious risk of frostbite. People must dress in warm clothes which can make outdoor work very slow and difficult. As a result, construction work such as building houses, shops and office; constructing roads and constructing mining operations to extract coal is limited and carried out in the Summer. Those people working in the mines must cope with the very demanding conditions.</p>
Inaccessibility	<p>Svalbard is very remote and can only be reached by plane or ship. There is one international airport, at Longyearben, with flights from Norway and Russia. There is a very limited road network (about 50km) mostly around Longyearben. Transport is mainly by snowmobiles.</p>
Provision of Buildings and Infrastructure	<p>People involved in construction (roads, buildings, harbour extension) must cope with very challenging weather conditions (extreme cold and winter darkness). Buildings are very well insulated. The frozen ground (permafrost) provides firm foundations but care must be taken to prevent thawing and subsistence. Gravel roads, raised above the ground surface (to prevent heat transfer), are relatively cheap to maintain. Domestic services (water sanitation) are raised off the ground in insulated pipes so they can be serviced and to prevent possible melting of permafrost.</p>

Exam Practice

Assess the importance of the interdependence of the climate, soils and people in **either** a hot desert environment **or** a cold environment.

[9 + 3 SPaG marks]

Introduction:
What is your environment?
What is interdependence?

Paragraph 1 -

How do humans rely on the physical conditions of the cold environment?
What are the physical conditions and why are they that way?

cough cough tourism.

Counterargument -

How are the physical conditions a problem for humans? What are the physical conditions? Why are they a problem?

Conclusion:
Your overall opinion linking back to the exam question.

For a hot desert environment or cold environment, you have studied, to what extent does that environment provide both opportunities and challenges for development?
[9 + 3 SPaG marks]

<p>Introduction: What is your environment?</p>	<hr/> <hr/> <hr/> <hr/>
<p>Paragraph 1 - Outline how the environment provides opportunities for development. Support with facts, stats and specifics. Examples - Tourism - ICT industry Resources</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Counterargument - Outline how the environment provides challenges for development. Examples - Climate - Conservation</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Conclusion: Your overall opinion linking back to the exam question.</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

For a hot desert environment or a cold environment, you have studied, assess the importance of management strategies used to reduce the risk of environmental damage.
[9 + 3 SPaG marks]

Introduction:
 What is your environment?

Paragraph 1 -
 In support Outline1 management strategy and explain how management has been important to reduce environmental damage.
 link to sustainability

Counterargument -
 Outline another management strategy and explain how management has been important to reduce environmental damage.
 link to sustainability

Conclusion:
 Your overall opinion linking back to the exam question.

For a hot desert environment or a cold environment, you have studied, to what extent is your chosen environment at risk from human activity.

[9 + 3 SPaG marks]

Introduction:
What is your environment?

Paragraph 1 -

Outline and explain the risks to your chosen environment as a result of humans.

Examples

- Tourism
- Resource
- Extraction
- urbanisation

Counterargument

discuss what is being done to counteract the risk from human activity.

Examples

- Sustainable homes
- National parks
- Laws and regulations

Conclusion:
Your overall opinion linking back to the exam question.

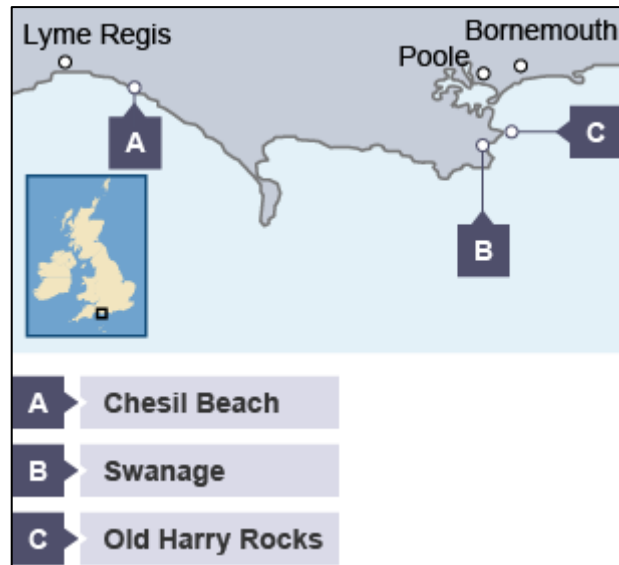
Dorset Coast, near Swanage, South East England

Location

Dorset is in the south of England. Its coastline has examples of many erosional and depositional landforms.

For example:

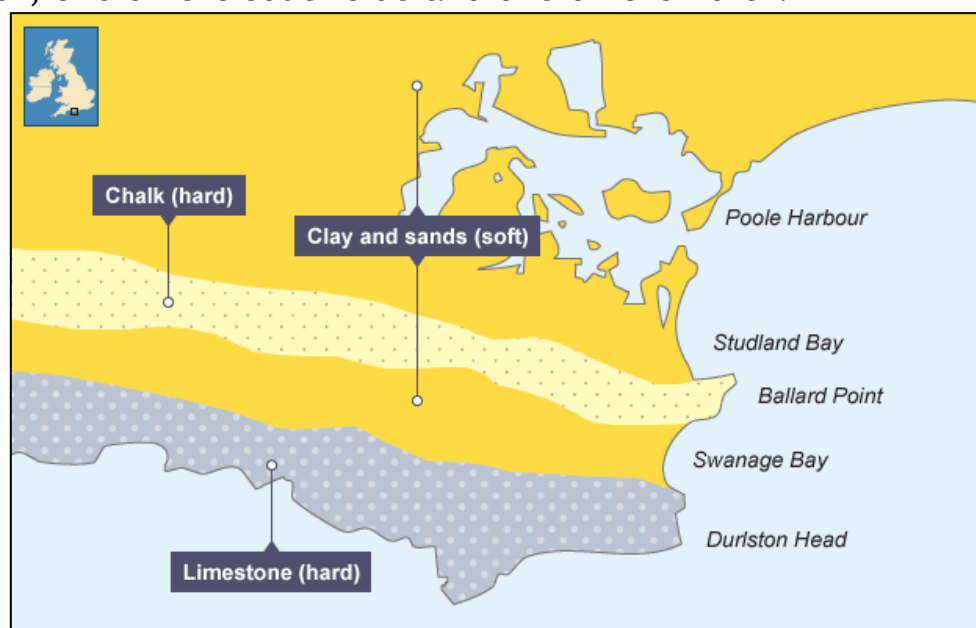
- Swanage is an example of a headland and bay
- Old Harry Rocks is an example of caves, stacks and stumps
- at Chesil Beach there is a bar



Swanage Bay

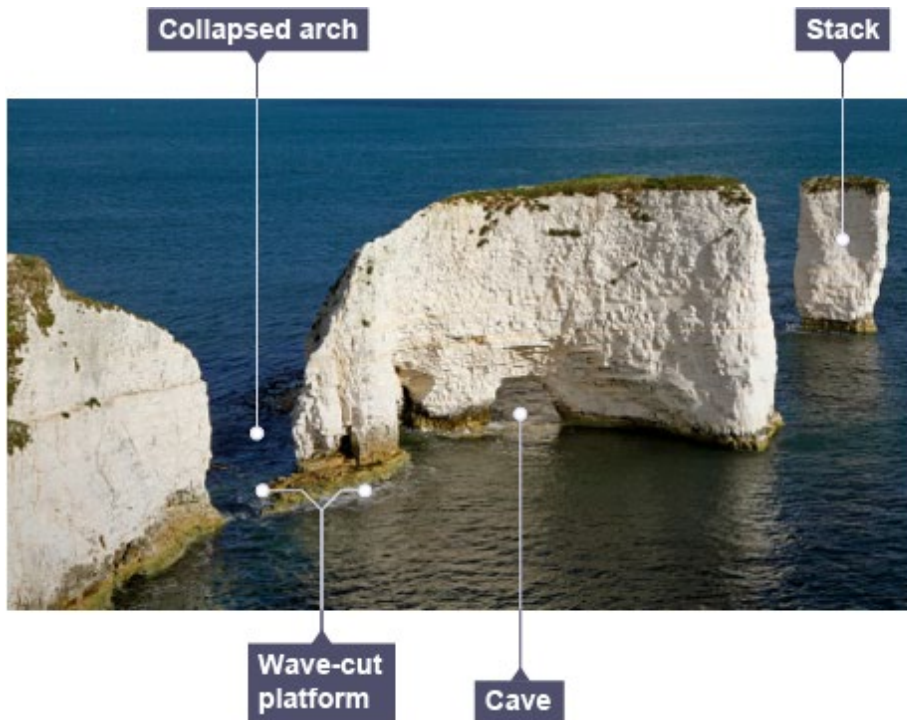
The area around Swanage is made up of bands of hard and soft rock. The soft rock is made of clay and sands, and the hard rock is chalk and limestone. As erosion processes take place, the clay erodes away quicker than the limestone and chalk. This forms headlands and bays creating Swanage Bay and two headlands - Ballard Point and Durlston Head.

To the north of Swanage is Poole Harbour, one of the UK's largest natural harbours. A great deal of deposition has taken place in this large sheltered bay. You can see two spits at the mouth of the harbour, one on the south side and one on the north.



Old Harry Rocks

Old Harry Rocks are located on the headland between Swanage and Studland Bay. The headland is made from chalk, a hard rock. The headland juts out into the sea, so it is more vulnerable to high-energy waves. This caused the formation of Old Harry, a stack. Over time Old Harry will collapse to form a stump.



Chesil Beach

Chesil Beach is an example of a bar. Sediment has been deposited over time to form a spit. The spit has continued to join to the Isle of Portland. Behind the spit there is The Fleet, a lagoon.



Exam Practice

Explain how different landforms may be created by the transport and deposition of sediment along the coast.

[6 marks]

Identify a landform created by transport and deposition. Explain how it is formed.

Identify an additional landform created by transport and deposition. Explain formation

Explain how different landforms may be created by erosion and weathering.
[6 marks]

Identify a landform created by erosion and weathering. Explain how it is formed.

Identify an additional landform created by transport and deposition. Explain briefly explain the formation

With reference to an example of a section of coastline, describe the major coastal landforms of deposition.
[6 marks]

Identify a landform created by deposition. Explain how it is formed.

Identify an additional landform created by transport and deposition. Explain briefly explain the formation

Medmerry Managed Retreat, West Sussex, South East England

Outline of Managed Retreat

Managed retreat (also known as managed realignment) allows an area that was not previously exposed to flooding by the sea to become flooded by removing coastal protection. This process is usually in low lying estuarine areas and almost always involves flooding of land that has at some point in the past been claimed from the sea.

Location

Medmerry is a nature reserve on the coast of West Sussex, South East England. This stretch of shoreline is one of the south coast's most vulnerable areas to flooding from the sea.

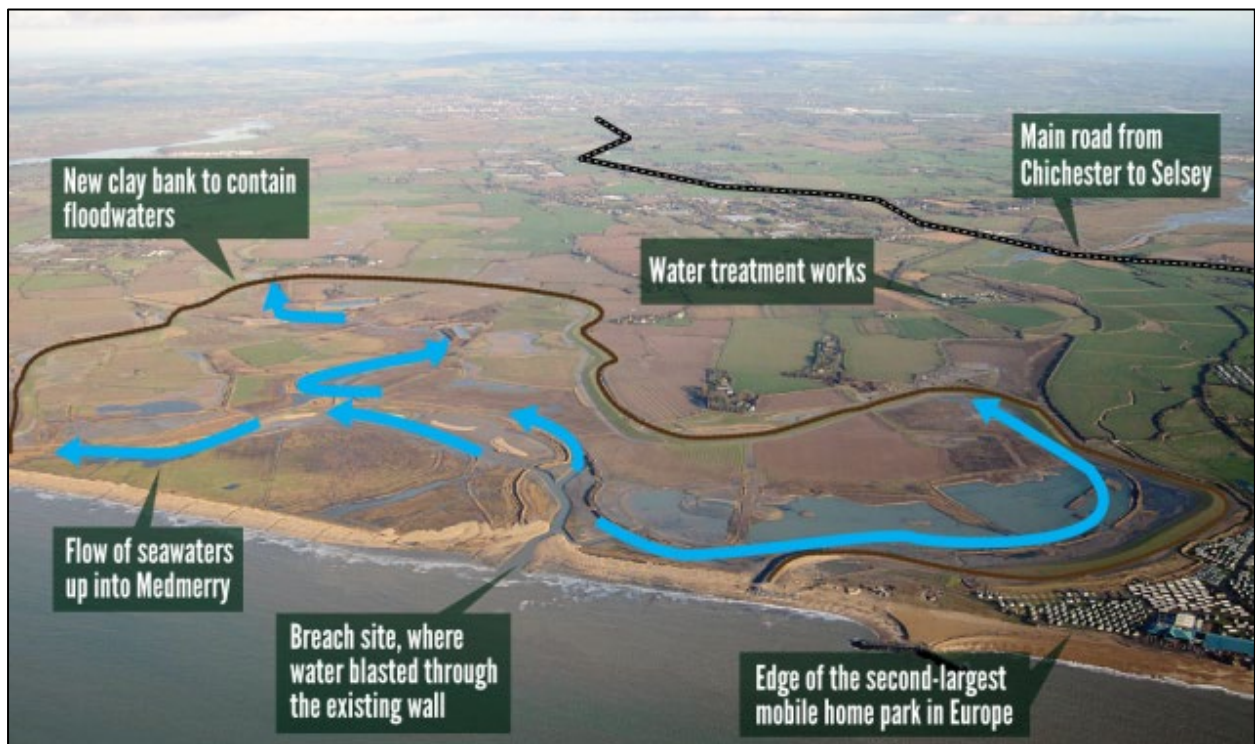
Requirement for the Scheme

This flat, low-lying and coast is mainly used for farming and caravan parks. For many years the land was protected by a low sea wall, but this is now in need of repair which would have cost £200 000 a year to maintain. The sea frequently breached the sea wall in 2008 costing £5 million worth of damage. With sea levels expected to rise, breaches would become more frequent. Given the relatively low value of the land, it was decided to allow the sea to breach the current sea defences and flood some of the farmland that was previously protected.

The Scheme

The Medmerry scheme cost £28 million and the controlled breaching of the old sea defences took place in November 2013. The Environmental Agency decided to follow the strategy of Managed Retreat, deliberately breaching the old sea wall to allow farmland to be flooded. Compensation was paid to residents and footpaths were redirected. A 2-kilometre embankment was constructed and around the perimeter of the area to be flooded to contain the waters and protect surrounding roads, farmland and caravan parks. Rock armour was placed at the seaward edges of the embankment to provide extra protection.

In the future the scheme will create a large natural saltmarsh to form a natural buffer to the sea, help to protect the natural surrounding farmland and caravan parks from flooding and establish a valuable wildlife habitat and encourage visitors to the area.



Impacts

Social

- Selsey now has a 1 in 1000 chance of coastal flooding which provides the best level of protection for people living in coastal zones in the UK.
- A maintenance access point behind the embankment provides a cycle route and footpath.

Economic

- Tourism, a main contributor to the local economy is expected to increase. Two new car parks and four viewing points give easy access.
- The newly flooded area is expected to become an important fishing nursery that will boost the local fishing industry in Selsey.

Environmental

- 300 hectares of new intertidal habitats are forming seaward of the embankment. Mudflats, saltmarshes and grasses have already attracted a large quantity of ducks and lapwings. The area is turning into a huge nature reserve.
- By carrying out a detailed environment assessment prior to flooding, designers were able to take measures to protect existing species such as water voles, crested newts and badgers.

Conflicts

Social

- Some residents still feel that the EA gave up the land too easily and insist that they should have explored alternative options such as offshore reefs or continued beach realignment.
- Some opponents came from outside the area; they resented such an expensive scheme for an area with a low population.

Economic

- At £28 million, the scheme was very expensive. It only cost £0.2 million a year to maintain the sea wall.
- For the managed retreat to take place, three farms growing rapeseed oil and winter wheat had to be abandoned. Losing income from loss of agriculture.

Environmental

- Despite planning, habitats of existing species such as badgers would have been disturbed.

Exam Practice

For a coastal landscape you have studied, outline the management strategy used. To what extent has this management strategy been useful?

[9 marks]

<p>Introduction: What is your coastal landscape?</p>	<hr/> <hr/> <hr/> <hr/>
<p>Paragraph 1 - Outline the management strategy and one way it has been successful. link to sustainability</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Counterargument - Outline a way the management strategy hasn't been successful. Think of the conflicts.</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Conclusion: Your overall opinion linking back to the exam question.</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Name an example of a coastal management scheme in the UK.

Assess whether the overall benefits outweigh any conflicts that are caused as a result of the scheme.

[6 marks]

Introduction:
What is your coastal management scheme?

Paragraph 1 -

Outline a way the scheme was successful.

Give evidence and examples.

Counterargument -

Outline a way that the conflicts outweigh the benefits.

Give examples and evidence.

Conclusion:
Your overall opinion linking back to the exam question.

'Hard engineering strategies are effective in protecting the coastline.' Do you agree with this statement? Explain your answer.

[6 marks]

<p>Introduction: What is your coastal management scheme? What is hard and soft engineering?</p>	<hr/> <hr/> <hr/> <hr/>
<p>Paragraph 1 - Hard engineering is more effective than soft engineering in managing the coastline. Link to examples.</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Counterargument - Soft engineering is more effective than hard engineering in managing the coastline. Link to examples.</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Conclusion: Your overall opinion linking back to the exam question.</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

River Tees, North East England

Location

The River Tees is in the north of England. The source of the River Tees is in the Pennines and it flows east to its mouth, where the river joins the North Sea.



Upper Course

The upper course has hard impermeable rocks. Here, vertical erosion has formed a V-shaped valley.

High Force is in the forest in Teesdale in the River Tee's upper course. The river drops 20m as a single sheet of water into the foaming and turbulent plunge pool below. It then continues its course through a spectacular gorge.

The waterfall was formed due to a resistant band of igneous rock (cooled volcanic lava) called *dolerite*, which cuts across the river valley. This has developed over hundreds of years to form High Force Waterfall.

The underlying darker rock with horizontal layers (called beds) is the *carboniferous limestone*.

The overlaying slightly lighter coloured rock with vertical joints is the *dolerite*. As the river plunges over the waterfall, it undercuts the weaker limestone forming an overhang. This eventually collapses, and



the waterfall gradually retreats upstream to form a gorge.

Middle Course

The River Tees flows from west to east near Darlington over relatively low-lying land in its middle course. Along this stretch of the River Tees are good examples of meanders, levees and flood plains. The meander at Sockburn is a good example.



Lower Course

Near Yarm, the meanders in the lower course are much larger, and oxbow lakes have formed. In this area there are also levees which have formed when the river has flooded.

The River Tees has a very large estuary entering the Bristol Channel with mudflats and sandbanks which supports wildlife in the area. Sites such as Seal Sands are protected areas.



Exam Practice

Explain the processes involved in the formation of a waterfall.

[6 marks]

Introduction:
What is river
landscape and
example of a
waterfall?

Describe the
geology of where
a waterfall forms

Explain how the
overhang and
plunge pool are
then created.

Use key terms
and refer to
difference erosion
processes.

For a river landscape you have studied, describe the erosional and depositional landforms from source to mouth.

[6 marks]

Introduction:
What is river landscape.

Describe the features in the upper course and middle course.

Describe the features in the lower course.

Explain the formation of an ox-bow lake. [6 marks]	
Introduction: What is river landscape.	<hr/> <hr/>
Describe the conditions needed for an ox-bow lake to form.	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Explain how the neck is narrowed and eventually cut through. Explain how the ox-bow lake is cut off from the main river channel.	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

'The causes of river flooding are usually the result of human factors'.

Do you agree with this statement? Explain your answer.

[6 marks]

Introduction:
State your opinion, do you agree or disagree.

Give one reason for your opinion, explain it and support with evidence.

Link it to either a human or a physical factor.

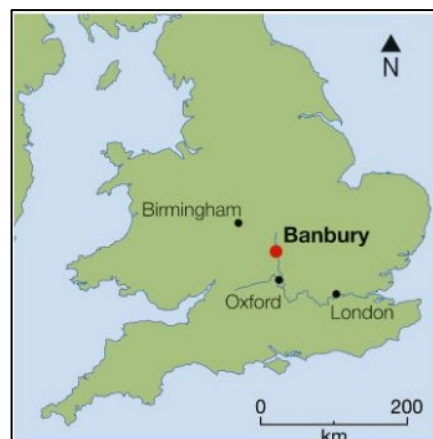
Give another reason for your opinion, explain it and support with evidence.

Link it to either a human or a physical factor.

Banbury Flood Storage Reservoir, Oxfordshire, England

Location

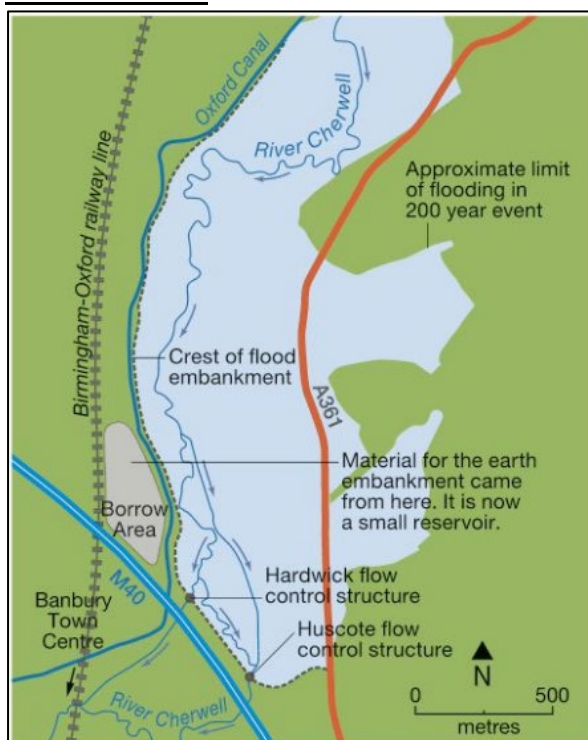
Banbury is a market town in Oxfordshire with a population of around 45 000 people. It is 50 kilometres north of Oxford. Much of town is on floodplain of the River Cherwell (tributary of River Thames).



Requirement for the Scheme

Banbury has been affected by the flooding of the River Cherwell many times in the past. In 1998 serious flooding closed the railway station and caused damage in excess of £12 million. Further flooding occurred in 2007.

The Scheme



The scheme was completed in 2012. A 2.9-kilometre earth embankment was built parallel to the M40 to provide a flood storage area. The embankment has a max height of 4.5m, it can hold 1200 Olympic size swimming pools (3 million cubic metres of water). The flood storage area collects rainwater that would have swelled the river and caused it to burst its banks. Two flow control structures were built in the embankment. The specially designed aperture (opening) controls the rate of flow downstream towards Banbury. Any excess water backs up behind the structure, filling up the reservoir

rather than continuing towards Banbury. The design avoids the need to open and close flood gates.

Additional flood defence measures that are part of the scheme include:

- Raising the A361 road in the storage area plus improvements to drainage beneath the road to improve drainage.

- New pumping station to transfer excess rainwater into the river below the town.
- The creation of a new biodiversity action plan habitat with ponds, trees and hedgerows to absorb and store excess water.

Issues

Social

- Transport disruption for local people has been alleviated by raising the A361 route into Banbury.
- New footpaths and green areas have improved people's wellbeing.
- Local people are less anxious about future flooding.

Economic

- Despite the high cost, benefits of protecting property and transport are estimated to save over £100 million.
- Reduced costs for flood damage for homeowners and transport (roads, railway station).
- Locals may receive lower insurance premiums for flood damage.

Environmental

- There was some habitat destruction in the construction of the embankment.
- Biodiversity Action Plan has resulted in planting trees and hedgerows and constructing ponds.
- Reservoir will provide a temporary habitat for water birds.
- The concrete apertures are unnatural in the landscape.

Exam Practice

Name an example of a flood management scheme in the UK.

Assess whether the overall benefits outweigh any conflicts that are caused as a result of the scheme.

[6 marks]

<p>Introduction: What is your flood management scheme?</p>	<hr/> <hr/> <hr/> <hr/>
<p>Paragraph 1 - Outline a way the scheme was successful. Give evidence and examples.</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Counterargument - Outline a way that the conflicts outweigh the benefits. Give examples and evidence.</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Conclusion: Your overall opinion linking back to the exam question.</p>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Explain the benefits of soft engineering strategies in reducing the flood risk.

[6 marks]

Introduction:
What is soft engineering? Give some examples of soft engineering.

Explain how soft engineering is better than hard engineering.

Link to your example.

Explain another benefit of how soft engineering is better than hard engineering.

Link to your example.
