Year 10 Mock Exam Revision

Section A – Natural Hazards

Natural Factors

There are several possible natural causes of climate change.

Orbital Changes

The Earth's orbit changes from circular to elliptical, which affects its distance from the Sun. When the orbit is more circular, the Earth's temperature is likely to increase, as the Earth is closer to the Sun. When the orbit is elliptical, the temperature is likely to decrease, as the Earth is further from the Sun.

Volcanic Activity

Volcanic eruptions release particles of SO_2 and CO_2 into the atmosphere. The SO_2 particles reflect the Sun's rays, reducing temperatures in the short term. Conversely, CO_2 is a greenhouse gas; it traps the Sun's heat, resulting in warmer global temperatures.

Solar Output

The Sun's solar energy output varies over time, which could result in changes to the Earth's climate. However, over the last 50 years, the Sun's energy output has declined slightly, despite the rise in global temperatures. Therefore, many people reject this theory.

Effects on the Environment

Warmer global temperatures will cause glaciers and ice sheets to melt, leading to rising sea levels and the loss of polar habitats.

Rising sea levels will result in low-lying coastal areas flooding more frequently or even becoming permanently submerged in water.

Many species of plants and animals are at risk of becoming extinct as their habitats are altered or damaged by climate change. For example, many of the world's coral reefs, which support a diverse range of marine life, are at risk of bleaching and destruction due to rising sea temperatures.

Warmer temperatures and higher sea levels will lead to more extreme weather events and a change in precipitation patterns.

Effects on People

As global temperatures rise, people in already hot regions will be at increased risk of developing heat-related health problems.

Many coastal areas at risk of flooding and areas that experience extremely high temperatures may become uninhabitable. This could lead to mass migration and overcrowding.

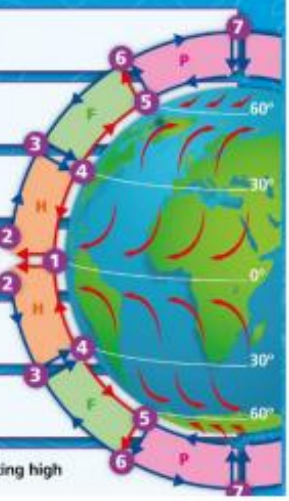
Although agriculture in some areas may benefit from warmer temperatures, many areas will become hotter and drier. This will result in drought, desertification and declining crop yields.

Drought and reduced crop yields will cause food and water shortages in many areas.

Global Atmospheric Circulation Model

There are three convection cells in each hemisphere: Hadley, Ferrel and Polar cells.

1. Warm air rises from the Equator, creating a belt of low pressure. As the air rises, it cools.
2. The resulting condensation creates clouds and rain that move north and south of the Equator.
3. At 30° north and south of the Equator, the cold, dry air sinks, creating high pressure and clear skies.
4. When the sinking air reaches the Earth's surface, it moves either back to the Equator or towards the poles.
5. At 60° north and south of the Equator, the surface air meets colder air from the poles, which causes it to rise, creating a belt of low pressure.
6. The air rises and cools. At a high level, this moves either back to the Equator or towards the poles.
7. At the poles, the cool air sinks to the Earth's surface, creating high pressure. The air then moves back towards the Equator.



The Three Ps: Prediction, Protection and Planning

Tropical storms can be predicted, so having effective prediction, planning and protection systems can significantly reduce the effects of storms.

Prediction
- Scientists use technology to predict when and where a storm is likely to occur.
- Hurricane warnings give people advice on the necessary actions to take (e.g. evacuation).

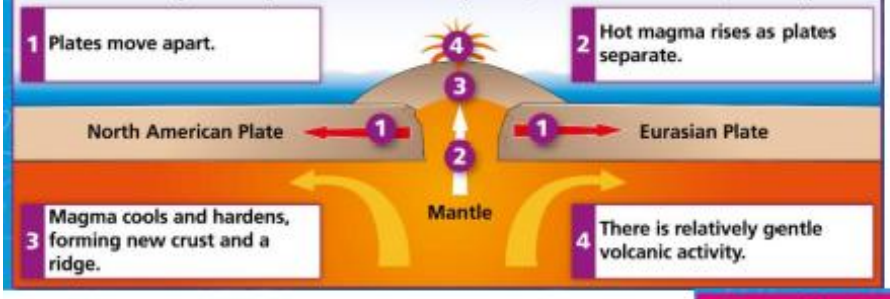
Protection
- Buildings can be constructed from reinforced concrete or built on stilts to protect against winds and flooding.
- Flood defences (e.g. levees and sea walls) can be built along rivers and coasts.

Planning
- Disaster kits can be provided for people in high-risk areas.
- Evacuation routes can help to get people away from danger quickly.

There are three types of plate margin: **constructive**, **destructive** and **conservative**.

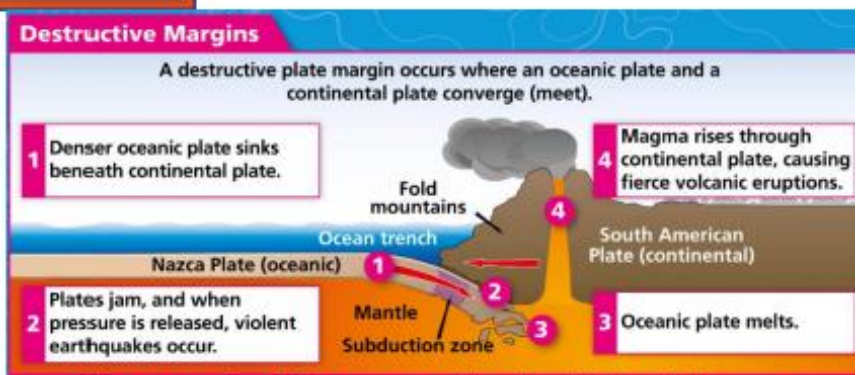
Constructive Margins

A constructive plate margin occurs where two plates (oceanic or continental) move apart.



Destructive Margins

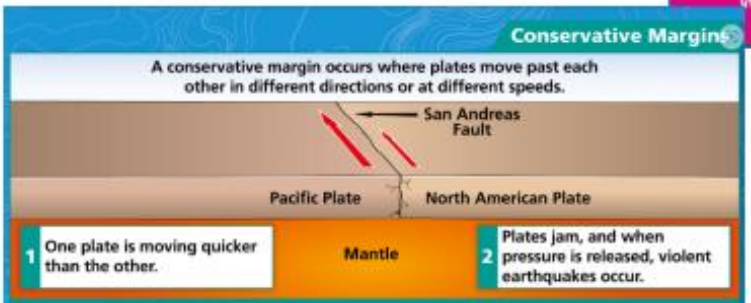
A destructive plate margin occurs where an oceanic plate and a continental plate converge (meet).



Where two continental plates converge, neither plate sinks. Instead, the pressure causes the ground to fold and push upwards, forming fold mountains.

Conservative Margins

A conservative margin occurs where plates move past each other in different directions or at different speeds.



There are no volcanic eruptions at conservative plate margins.

Mid-Atlantic Ridge	Ring of Fire	San Andreas Fault
Constructive Margin	*Destructive Margin*	*Conservative Margin*

Section B – The Living World

Food Chains

A food chain shows the direct transfer of energy between organisms in an ecosystem. In a food chain, organisms can be classed as producers, consumers or decomposers.

The Sun is the source of all energy.

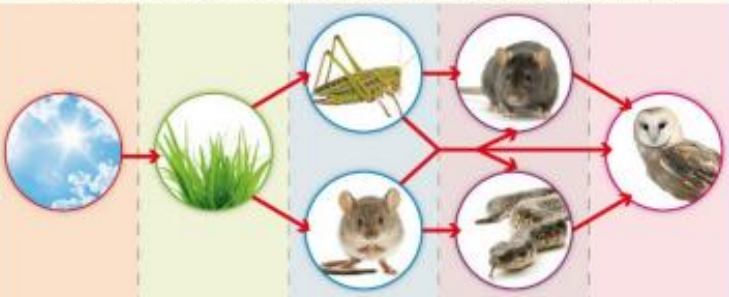
Producers (e.g. hawthorns) convert sunlight into energy to produce food.

Consumers (e.g. mice) feed on producers, other consumers or both.

Decomposers (e.g. fungi) feed on dead or decaying matter.

Food Webs

A food web is a series of interlinked food chains. The food web example below shows the interaction between producers and consumers within an ecosystem. In this example:



The Sun is the source of all energy.

The producer (grass) converts sunlight into food through photosynthesis.

Primary consumers (grasshoppers and mice) feed on the producer.

In turn, secondary consumers (rats and snakes) feed on the primary consumers.

Tertiary consumers (owls) can feed on all other consumers.

Effects of Deforestation

Deforestation has several effects locally, nationally and globally.

Soil Erosion	Economic Development	Climate Change
When trees are removed from an area, the soil is no longer held together by tree roots. The soil erodes and its nutrients are leached, reducing soil fertility and preventing further plant growth.	The farming, mining and logging industries provide many jobs and significant income for rainforest countries, boosting their economies and helping them pay off foreign debts.	Trees in the Amazon store 20% of all the carbon in the Earth's biomass. As large portions of the rainforest are cleared, CO_2 is released into the atmosphere, adding to the greenhouse effect.

Impacts of Deforestation

Indigenous peoples have long cleared small areas of forest with little damage. However, modern large-scale deforestation has had huge environmental, economic and social impacts.

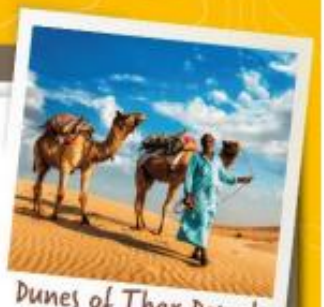
Trees remove CO_2 from the atmosphere; increased CO_2 levels contribute to the greenhouse effect and rising global temperatures. Fewer trees means fewer roots to soak up water from the soil, so more nutrients are leached. Deforestation also reduces biodiversity: plants and animals become extinct due to a lack of food and shelter.

In 1500, 6.9 million people were living in the Amazon rainforest. Only 200,000 remain there today as their homes are destroyed by deforestation. Moreover, deforestation's effects make these areas less attractive to tourists, leading to lost income. However, more jobs are being created through logging, farming and mining, and selling timber can also be very profitable.

Hot Deserts: Thar Desert

Thar Desert Fact File

The Thar Desert lies partly in north-western India and partly in eastern Pakistan and covers an area of over 200,000 km². Its population of 30 million people gives it a population density greater than 80 people/km², the highest of any desert.



Dunes of Thar Desert

Development Opportunities

Though life in the Thar Desert can be challenging, the desert's location and natural resources (e.g. minerals, fossil fuels) have created a range of opportunities for future development.

Water well

Mineral Extraction

Minerals such as gypsum, limestone and white marble are valuable building materials, and kaolin can be used to manufacture paper.

Tourism

With its exotic location and vibrant village culture, the Thar Desert attracts a growing number of tourists. Locals can earn money by selling souvenirs, acting as tour guides or offering camel rides.

Energy Production

The lignite coal and oil found in Barmer District is used to power coal-fired electricity plants in Pakistan and India. Although coal extraction remains popular, the desert's sunny climate and high winds have created opportunities to generate green energy. There is already a wind park at Jaisalmer and a solar energy plant at Bhaleri.

Farming

The Indira Gandhi Canal has provided irrigation for commercial crops such as wheat, cotton and pulses. It is also a source of drinking water. Sustainable drought-tolerant trees, such as the jujube tree, are planted to stabilise sand dunes and produce a valuable crop.

Section C - Coasts

Bars and Spits

Spits are long stretches of sand or shingle that extend from the land. They form where the coastline suddenly changes shape (e.g. at river mouths or estuaries).

Sand and shingle are transported by longshore drift past the point where land ends. As the waves lose energy, material is deposited, forming a spit. Strong winds can cause the end of the spit to curve towards the land, creating a recurved end.

In the sheltered area behind the spit, vegetation can grow easily, and a salt marsh may form.

Bars form when a spit joins two headlands together, trapping the water in a lagoon behind it.

Hard Engineering

Hard engineering involves the use of man-made structures to reduce the erosive potential of waves.

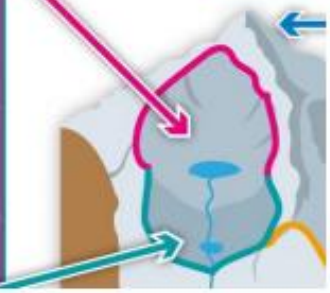
Defence	Description	Advantages	Disadvantages
Sea Walls 	Walls are built at the back of beaches to reflect waves back to the sea. They are usually curved to better reflect waves.	They prevent erosion but not the movement of sediment, which can affect other areas. Well-maintained walls can last for years.	They create a strong backwash, which can erode wall foundations. They are expensive to build and maintain, and can appear unsightly.
Rock Armour 	Large boulders are placed along the coastline to absorb the power of waves.	It is highly effective at absorbing wave power. It is relatively cheap, quick to build and easy to maintain.	Boulders are often sourced from other locations and may appear unsightly next to the local geology.
Groynes 	Concrete or wooden barriers are built at right angles to the beach to prevent longshore drift, trap sediment and absorb the power of waves.	They are relatively cheap and effective at preventing erosion. They create larger beaches, which can attract more tourists.	The restriction of the movement of sediment may simply move the problems of erosion further down the coast.
Gabions 	Wire cages filled with rocks are placed at the base of cliffs to absorb wave energy.	They are cheap and easy to construct, making them a good short-term solution. They are often made from local materials.	The wire cages are ugly and can erode within 10 years. If broken, loose material can be dangerous.

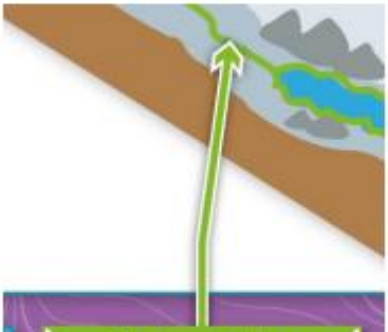
Glaciation

Corries (Cwms)

Snow accumulated in hollows and formed small glaciers. Through rotational slip, the ice moved, eroding the hollows and creating large valleys with steep back walls and shallow front lips.

Eros





Ribbon Lakes

At the bottom of glacial troughs, glaciers eroded soft rock faster than hard rock, creating long, thin hollows and lakes.

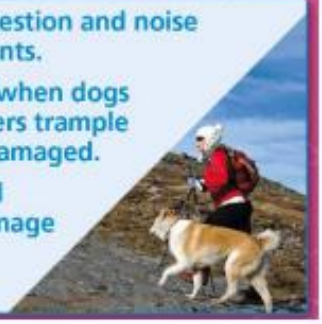
Tourism

£ Economic Opportunities

- Tourism is a large source of income, providing business and job opportunities for local people.
- The beautiful landscape and lack of industry is attractive to tourists.
- The rugged hills are perfect for activities such as hiking, walking, climbing and biking.

Conflicts with Other Land Users

- Increased traffic congestion and noise can upset local residents.
- Farmers are affected when dogs frighten sheep, walkers trample crops and walls are damaged.
- Increased footfall and development can damage natural habitats.



Litter on grass

Environmental Impacts

Money from tourists can be used to conserve and protect areas of wildlife. However, tourism also has large-scale damaging effects on the environment:

- Walkers erode footpaths, causing damage to surrounding areas.
- Discarded litter can be hazardous to birds and animals.
- Noisy water sports on Windermere may frighten wildlife.
- Vehicles parked on verges churn up soil, destroying vegetation.