

CAIE Geography Pre-U

3A - Tectonic Hazards

Flashcards

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What is the evidence to support the plate tectonic theory?



What is the evidence to support the plate tectonic theory?

Continental drift, geology and fossil records and paleomagnetism.



What is continental drift?



What is continental drift?

A theory that states that continents have moved and were once joined in a supercontinent known as Pangea.



How does continental drift support the plate tectonic theory?



How does continental drift explain the plate tectonic theory?

Some continents appear as if they could fit together and so were once joined.



How does paleomagnetism support plate tectonic theory?



How does paleomagnetism support plate tectonic theory?

Rock contains minerals that when they were laid down would be orientated to the north pole. Some minerals are orientated in a way that they would have had to be laid down somewhere else. The patterns of orientation of minerals by mid-ocean ridges on either side are mirror images and alternate due to switching of the north pole.



What are the mechanisms for plate movement?



What are the mechanisms for plate movement?

Convection currents, ridge push and slab pull.



How do convection currents move plates?



How do convection currents move plates?

Warm magma rises up through the mantle, cools and then sinks. This sets up a convection current where the plates move along the top.



How does ridge push move plates?



How does ridge push move plates?

Cooling and subsiding of newly formed rock at mid-ocean ridges exerts pressure on the plates and pushes them apart.



How does slab pull move plates?



How does slab pull move plates?

A cooler, denser plate at a destructive plate margin subducts under a lighter plate and pulls the rest of the plate along.



What are the three types of plate margin?



What are the three types of plate margin?

Constructive, destructive and conservative.



What is a destructive plate margin?



What is a destructive plate margin?

Where a denser, oceanic crust is subducted under a lighter continental crust.



What occurs at a destructive plate margin?



What occurs at a destructive plate margin?

Earthquakes, subduction zone, deep ocean trenches, volcanoes, island arcs and fold mountains.



What is a constructive plate margin?



What is a constructive plate margin?

Where two plates are moving away from each other.



What occurs at a constructive plate margin?



What occurs at a constructive plate margin?

Seafloor spreading, mid-ocean ridges, rift valleys and volcanic activity.



What is a conservative plate margin?



What is a conservative plate margin?

Where two plates are moving in opposite directions but parallel to each other or in slightly different directions.



What occurs at a conservative plate margin?



What occurs at a conservative plate margin?

Earthquakes



What is a hot spot?



What is a hot spot?

Areas under the crust which are fed by mantle plumes which are significantly hotter than the surrounding mantle.



What occurs at a hotspot?



What occurs at a hotspot?

Volcanic chains or island arcs.



What is a supervolcano?



What is a supervolcano?

A volcano that deposits material of a volume greater than 1,000 cubic kilometers.



Name 5 types of volcanic eruptions.



Name 5 types of volcanic eruption.

Hawaiian, strombolian, vulcanian, plinian
and surtseyan.



What is a hawaiian eruption?



What is a hawaiian eruption?

Where fluid basaltic lava is thrown into the air in jets from vents.



What is an example of a hawaiian eruption?



What is an example of a hawaiian eruption?

The 1959 eruption of Kilauea.



What is a strombolian eruption?



What is a strombolian eruption?

Distinct bursts of fluid lava from a magma-filled summit conduit.



What can strombolian eruptions also form?



What can strombolian eruptions also form?

Lava bombs and lava flows.



What are vulcanian eruptions?



What are vulcanian eruptions?

Short, violent, relatively small explosion of viscous magma.



What does a vulcanian eruption produce?



What does a vulcanian eruption produce?

Tephra, ash clouds and pyroclastic density currents.



What is a plinian eruption?



What is a plinian eruption?

Largest and most violent where columns of ash and gas rise high up in the sky.



What is an example of a plinian eruption?



What is an example of a plinian eruption?

Mount St Helens, 1980



What is a surtseyan eruption?



What is a surtseyan eruption?

When magma interacts explosively with water.



What are the hazards of volcanoes?



What are the hazards of volcanoes?

Pyroclastic flows, lava flows, tephra, lahars, jokulhlaups and toxic gases.



What are pyroclastic flows?



What are pyroclastic flows?

High-density mixture of hot-fragmented solids and expanding gases that travel over 100km/hr down the side of a volcano at 200-700°C.



What is tephra?



What is tephra?

Fragmented material ejected by a volcano.



What are the hazards from tephra?



What are the hazards from tephra?

Dangerous to aeroplanes, creates poor visibility, disrupt electricity and cause lightning.



What are lahars?



What are lahars?

Pyroclastic flows that contain more water and are similar to mudflows.



What are jokulhlaups?



What are jokulhlaups?

Where there is a violent, short-lived and sudden increase in the discharge of glacial meltwater.



Between 1900 and 1986 what percentage of deaths came from toxic gases?



Between 1900 and 1986 what percentage of deaths came from toxic gases?

3%



What are the hazards from earthquakes?



What are the hazards from earthquakes?

Ground shaking, liquefaction, landslides and tsunamis.



What does groundshaking cause?



What does groundshaking cause?

Causes stress in structures and destabilisation of cliffs and sloping grounds. It can cause buildings to collapse and death and injury.



What is liquefaction?



What is liquefaction?

Where seismic activity agitates ground material of certain types and causes the ground to not be able to support the same amount of weight.



Where can landslides occur?



Where can landslides occur?

When an incline with relatively large masses of material is supported by soil that will easily soften under strain.



How is a tsunami formed?



How is a tsunami formed?

When a large, undersea earthquake at a plate boundary occurs and the ocean floor rises or falls suddenly and so causes the displacement of water above it.



What is the Richter scale?



What is the Richter scale?

Quantitative measure of the size of the earthquake measured by a seismograph.



What is the Mercalli scale?



What is the Mercalli scale?

Describes the effect of an earthquake by listing several effects from the intensity of the earthquake.



What are the methods of prediction and risk identification?



What are the methods of prediction and risk identification?

Seismographs, gas emissions, satellites and hazard mapping.



Why are seismographs useful?



Why are seismographs useful?

Detects the length and strength of an earthquake, cannot predict an earthquake but earthquakes are often precursors for volcanic eruptions.



Why is measuring gas emissions useful?



Why is measuring gas emissions useful?

The amounts and ratios of gases changes before an eruption and this can be monitored to be predict if an eruption will occur.



Why are satellites useful?



Why are satellites useful?

Can measure the height of the volcano and can detect any changes in shape which often occur before an eruption.



Why is hazard mapping useful?



Why is hazard mapping useful?

Volcanic hazards can be identified from past eruptions and plotted on a map. This can be used to share areas of risk and also to determine safe zones.



What are some of the building improvements that can be made against earthquake hazards?



What are some of the building improvements that can be made against earthquake hazards?

Rubber shock absorbers in foundations, steel frames which can sway, open areas where people can assemble, wire mesh retrofitting, lightweight roofs and safety glass.



What are some of the ways to protect against volcanoes?



What are some of the ways to protect against volcanoes?

Creation of exclusion zones, channels to divert lava flows, making sure buildings are not in valleys or downstream from volcanoes and having a strong roof which is at a steep angle.



What are the preparation methods for tectonic hazards?



What are the preparation methods for tectonic hazards?

Hospitals, emergency services and residents all need to practise and carry out drills. Buildings in high risk areas should all have emergency kits.



What are the short-term rescue and recovery methods?



What are the short-term rescue and recovery methods?

Search and rescue teams that use sniffer dogs and/or thermal imaging cameras. Medical aid, food and drinking water need to be supplied. Normally NGOs and disaster relief teams in LICs and emergency services in HICs.



What are the long-term rescue and recovery methods?



What are the long-term rescue and recovery methods?

Infrastructure and amenities need to be rebuilt and improved on. Compensation through insurance and the stimulation of the economy.



What is Haiti's rank for HDI?



What is Haiti's rank for HDI?

168 out of 187



What percentage of Haiti's population is at risk from two or more hazards?



What percentage of Haiti's population is at risk from two or more hazards?

96%



What was the magnitude of the 2010
Haiti earthquake?



What was the magnitude of the 2010 Haiti earthquake?

7 on the Richter scale.



What were the impacts from the Haiti 2010 earthquake?



What were the impacts from the Haiti 2010 earthquake?

3.5 million affected, 220,000 people died, 300,000 were injured, over 188,000 houses were damaged and 1.5 million people were left homeless.



What was the short-term management of the Haiti earthquake?



What was the short-term management of the Haiti earthquake?

Disaster management teams from around the world, NGOs handed out food and Oxfam delivered clean drinking water. Massive camps were set up.



What was the long-term management of the Haiti earthquake?



What was the long-term management of the Haiti earthquake?

NGOs replaced tents with earthquake resilient houses, microcredit schemes were set up, rice mills were built, farming methods were improved and simulation exercises were set up.



What was the magnitude of the Tohoku
2011 earthquake?



What was the magnitude of the Tohoku 2011 earthquake?

9 on the Richter scale.



How much land did the tsunami flood?



How much land did the tsunami flood?

500 square kilometres.



What were the impacts of the 2011 Tohoku earthquake?



What were the impacts of the 2011 Tohoku earthquake?

18,000 people died, 0.5 million were made homeless, shortage of food, petrol and medical supplies, and 1 million were left without running water. Radiation leak from a nuclear power plant.



What was the short-term management of the Tohoku earthquake?



What was the short-term management of the Tohoku earthquake?

20km evacuation zone around the power plant, within 30 minutes 11 military aircraft were up in the air, within 2s of the earthquake being detected all of Tohoku's bullet trains had been stopped.



What was the long-term management of the Tohoku earthquake?



What was the long-term management of the Tohoku earthquake?

Within 8 months 96% of electricity, 98% of the water supply and 99% of landline networks had been re-established. 23 trillion yen was set aside to help rebuild.



What were the impacts of the Nyiragongo eruption?



What were the impacts of the Nyiragongo eruption?

45 people died in the first 24 hours, 50 people were killed in a gas explosion, 30% of the city was destroyed, 350,000 were dependent on aid one month after, and cholera spread.



What were the responses to the
Nyiragongo eruption?



What were the responses to the Nyiragongo eruption?

Help from aid although many countries reluctant to give long-term aid due to political instability.



What were the impacts of the Mount St Helens eruption?



What were the impacts of the Mount St Helens eruption?

57 people died. 250 homes, 47 bridges and 15 miles of railway were destroyed. Cost \$1.1 billion. All aquatic life as well as every animal within 25 km were killed.



What were the responses to the Nyiragongo eruption?



What were the responses to the Nyiragongo eruption?

Stranded people were rescued, shelter provided, \$300 million worth of trees planted, farmers compensated \$70 million and new tourist facilities were built.



How much did the Eyjafjallajokull eruption cost airline industries each day?



How much did the Eyjafjallajokull eruption cost airline industries each day?

£130 million



How much CO₂ was prevented from entering the atmosphere due to the reduction in air flights?



How much CO₂ was prevented from entering the atmosphere due to reduction in air flights?

1.3 to 2.8 million tonnes.

