

Paper 1: Natural Hazards: Tectonic

What is a natural hazard?	
A natural hazard is a natural process which could cause death, injury or disruption to humans, property and possessions.	
The Earth's Structure	
The Crust – the outer layer	Varies in thickness (5-10km) beneath the ocean. Made up of several large plates of oceanic and continental crust
The Mantle	The heat and pressure means the rock is in a liquid state. Hottest section (5000 degrees). Widest layer (2900km thick).
The Inner and outer Core	Mostly made of iron and nickel and is 4x denser than the crust. Inner section is solid whereas outer layer is liquid.
Convection Currents	
1	Radioactive decay of elements in the core and mantle generate a lot of heat.
2	When lower parts of the mantle molten rock (Magma) heat up they become less dense and slowly rise.
3	As they move towards the top they cool down and slowly sink.
4	These circular movements of semi-molten rock are convection currents
5	The currents create drag on the base of the plates causing them to move.
Plate boundaries	
Destructive	When the denser plate subducts beneath the other, friction causes it to melt and become molten magma. The magma forces its way up to the surface to form a volcano. This margin is also responsible for devastating earthquakes.
Collision	When 2 continental crusts move towards each other; neither sink but instead crumple up to form fold mountains like the Himalayas.
Constructive	Here two plates are moving apart causing new magma to reach the surface through the gap. Volcanoes formed along this crack cause a submarine mountain range such as those in the Mid Atlantic Ridge.
Conservative	Where plates slide past each other in opposite directions, or in the same direction but at different speeds. This is responsible for earthquakes such as the ones happening along the San Andreas Fault, USA.
Causes of earthquakes	
Two plates become <u>locked together due to friction</u> . The pressure builds until it eventually breaks causing energy in the form of <u>seismic waves</u> to travel through the ground causing an earthquake.	
EPICENTRE.	The point directly above the focus, where the seismic waves reach first,
FOCUS.	The point at which pressure is released is called the
SEISMIC WAVES	energy waves that travel out from the focus.
Earthquake management	
PREDICTION	PROTECTION
<p>Methods are only able to predict seconds before the earthquake happens or within a vague time</p> <ul style="list-style-type: none"> - Satellite surveying (tracks changes in the earth's surface) - Laser reflector (surveys movement across fault lines)- - Radon gas sensor - Seismometer - Water table level (water levels fluctuate before an earthquake). 	<p>You can't stop earthquakes, so earthquake-prone regions follow these three methods to reduce potential damage:</p> <ul style="list-style-type: none"> • Building earthquake-resistant buildings • Raising public awareness <p>Improving earthquake prediction</p>

Chile 2010 (8.8 magnitude) HIC – Nazca and South American plate – Destructive Boundary	
Primary Impacts —those that happen during or the moments immediately after the event	Secondary Impacts - those that happen in the hours or even weeks after the event
<ul style="list-style-type: none"> • 500 people were killed. • 12,000 injured. • 220,000 homes, 4,500 schools, 53 ports, 56 hospitals destroyed. • North – south highway badly damaged • Loss of power, water and communications. • Santiago airport badly damaged. 	<ul style="list-style-type: none"> • 1500km of roads damaged by landslides. • Coastal towns affected by tsunami waves. • Pacific countries were affected by the tsunamis as well. • Fire at a chemical plant near Santiago.
Immediate responses	Long term responses
<ul style="list-style-type: none"> • Emergency services acted swiftly. • International help aided with supplying field hospitals, communication etc. • Power and water restored to 90% of homes within 10 days. • National appeal raised US\$60 million—enough to build 30,000 small emergency shelters. • Repairs were made to the north – south highway within 24 hours 	<ul style="list-style-type: none"> • A month after the earthquake Chile's government launched housing reconstruction plan to help 200,000 households. • President announced it will take 4 years to recover fully from the damage to buildings and ports.. • Rebuilt without foreign aid (using money generated from copper industry)

Nepal (Ghorka) 2015 (7.9 magnitude) LIC – Eurasian & Indian Plate – Collision boundary	
Primary Impacts —those that happen during or the moments immediately after the event	Secondary Impacts - those that happen in the hours or even weeks after the event
<ul style="list-style-type: none"> • 9000 people were killed. • 20,000 people were injured. • A third of Nepal's population (8 million) were affected. • 7000 schools destroyed. • 50% of shops destroyed affecting food supplies and people's livelihoods. • Buildings destroyed included temples in Kathmandu • Rice crop was damaged 	<ul style="list-style-type: none"> • Landslides and avalanches were triggered which blocked rural communities. • Avalanche on Mt Everest, in the Himalayas killed at least 19 people (climbers/ Sherpas) • Landslide blocked a major river which increased the risk of flooding. • Avalanche in Langtang region left 250 people missing.
Immediate responses	Long term responses
<ul style="list-style-type: none"> • Search and rescue teams from abroad such as UK, India and China. • Helicopters rescued many people caught in avalanches on Mt Everest. • Financial pledge from other countries. • 300,000 people migrated from Kathmandu to seek shelter. • Twitter was used in search and rescue. • A road blockade in India slowed the responses 	<ul style="list-style-type: none"> • Roads repaired and landslides cleared using foreign aid money. • Hosted an international conference to discuss reconstruction and seek technical and financial support from other countries. • Tourism was boosted to increase Nepal's income to use for rebuilding. • Mount Everest reopened in 2015 for climbers with new trekking routes

