

Knowledge Organiser

The Challenge of Natural Hazards

Part One: Plate Tectonics and Earthquakes

Key Terms

Plate Margin
The boundary between two tectonic plates.



Volcano

An opening of the earth's crust from which lava, ash and gases erupt.



Earthquake

A sudden or violent movement within the Earth's crust followed by a series of shocks.



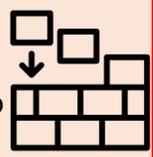
Impact

The effects of a natural hazard on people, the economy and the environment.



Response

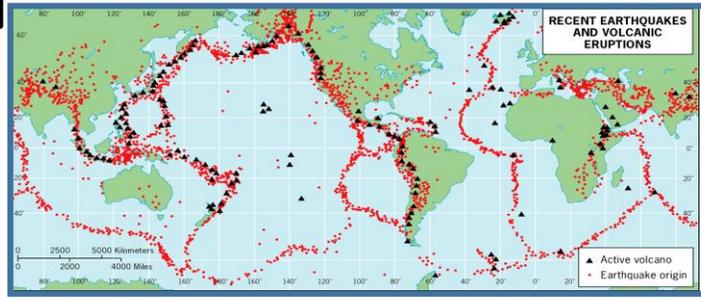
What happens after a natural hazard in order to recover.



Natural hazards are naturally occurring events that pose a risk to human life and property. The type, frequency and magnitude of the hazard affect the severity of the risk.

Factors Affecting Hazard Risk

Population Density	Deforestation
Wealth	Climate Change



Location of Earthquakes and Volcanoes

Earthquakes and volcanoes are not randomly distributed. The pattern matches where plate margins are located. Earthquakes and volcanoes can be found on land and in the sea. Not every earthquake or volcano are found on a margin, those that aren't are known as 'hotspots'.

Plate Margins

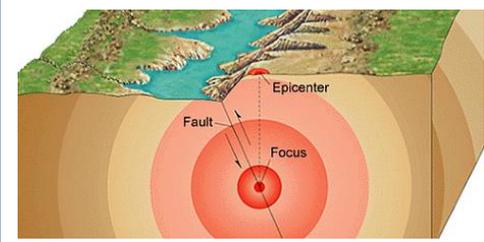
Constructive
2 plates move away from each other due to convection currents/slab pull, leaving a gap between the two plates. Magma rises up from the mantle to fill the gap, creating **NEW CRUST** (new land). This usually happens under the oceans. The new creation of land is called **SEA-FLOOR SPREADING**.

Destructive
2 plates move towards each other due to convection currents/slab pull. The denser oceanic plate is pushed beneath the lighter continental plate. This process is called **SUBDUCTION** and occurs at a **subduction zone**.

Conservative
2 plates slide past each other due to convection currents/slab pull. They can be moving in opposite directions or moving in the same direction but at different speeds. The line between the two plates is called the **FAULT LINE**.

Can I find Earthquakes or Volcanoes here?		
Constructive	Destructive	Conservative
✓	✓	✗
✓	✓	✓

Earthquakes

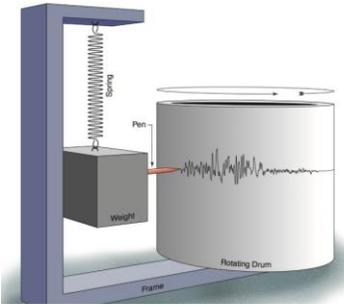


As the tectonic plates suddenly move, they send out **SHOCK WAVES** (vibrations).

The point of movement in the earth's crust is called the **FOCUS**. The point directly above the focus is called the **EPICENTRE**.

The closer you are to the focus and epicentre, the stronger the earthquake will be.

How do we measure earthquakes?
It records the amount of energy released. This is called the **MAGNITUDE** of an earthquake.



Do Earthquakes affect all people equally? NO!

There are a number of factors which can influence the impacts of an earthquake.

- Distance from the epicentre
- Level of development (HIC, NEE or LIC?)
- Time of day and year
- Magnitude**
- Population density (rural or urban area).**

EARTHQUAKE MAGNITUDE AND INTENSITY



The Challenge of Natural Hazards- Earthquake Case Studies

<u>Key Data</u>	L'Aquila, Italy	Ghorka, Nepal
Income level	High income	Low income
GDP	US\$2.144 trillion (2014)	US \$19.64 billion (2014)
GNI per capita	US\$34,280 (2014)	US\$730 (2014)
Magnitude	6.3 magnitude	7.8 magnitude
Time of day	3:32 am	11:56am
Deaths	308	8,841 (19 on Mt Everest)
Homeless	67,500	1,000,000
Hospitals damaged	San Salvatore Hospital	26 hospitals
Sites damaged	Basilica of St Bernadino, National Museum	World Heritage sites, eg Dharahara Tower
Cost of damage	US\$16 billion	US\$5.15 billion
Amount of aid	US\$552.9 million from the EU	US\$274 million from EU

Key	Primary effects	Secondary Effects	Immediate Responses	Long-term Responses
	L'Aquila, Italy 		Ghorka, Nepal 	
	<ul style="list-style-type: none"> 308 people were killed Approximately 10,000-15,000 buildings collapsed The EU reported US\$11,434 million of damage to L'Aquila 		<ul style="list-style-type: none"> 325 aftershocks, including a second Earthquake on 12th May measuring 7.3 magnitude. A reduced supply of water, food and electricity. 8,841 people died. 	
	<ul style="list-style-type: none"> Aftershocks triggered landslides and rockfalls, causing damage to housing and transport. The number of students at L'Aquila University has decreased. Much of the city's central business district was cordoned off due to unsafe buildings 		<ul style="list-style-type: none"> In 2014, the World Travel and Tourism Council reported that tourism was 8.9% of Nepal's GDP and provided 1.1 million jobs. The earthquake disrupted the planting of food, causing food shortages and income loss for farmers. 	
	<ul style="list-style-type: none"> For those made homeless, hotels provided shelter for 10,000 people and 40,000 tents were handed out. The EU provided US\$552.9 million from its major disaster fund Water, hot meals, tents and blankets were distributed. The British Red Cross raised £171,000 in support. 		<ul style="list-style-type: none"> Nepal requested international help. The UK's DEC raised \$126 million by September 2015. Temporary shelters were set up. The Red Cross provided tents for 225,000 people. The UN and WHO distributed medical supplies to the worst affected districts. 	
	<ul style="list-style-type: none"> No taxes were paid by the residents of L'Aquila during 2010. To encourage students back to the University fees were dropped for 3 years In 2012, six scientists and one government official were found guilty of manslaughter as they had not predicted the earthquake. 		<ul style="list-style-type: none"> Buildings were constructed from to stricter codes Homeless people were re-housed and 7000 schools were re-built 1 million people were pushed in to poverty as a direct result of the earthquakes. 	