

The Challenge of Natural Hazards Tectonic Hazards Knowledge Organiser

- Natural hazards pose major risks to people and property.
- Natural hazards are natural processes which cause damage, injury and death.
- Geological hazards are caused by tectonic processes.
- Different factors affect hazard risk including the severity of the natural hazard, the ability of a place to cope with the hazard and the likelihood that a hazard will occur.

Global Distribution

Most tectonic activity is along plate margins and on the edge of continents. Some volcanoes form over hotspots in the mantle eg. Hawaii.



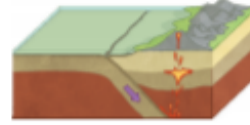
Earthquakes and Volcanic Eruptions

- The crust is divided into tectonic plates.
- They move because of convection currents in the mantle.
- The plates meet at plate boundaries.

There are different types of plate boundaries:

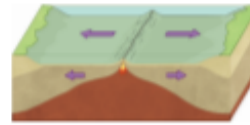
Destructive Margins

Where two plates move towards each other; the oceanic plate will be destroyed as it is forced beneath the continental plate, creating volcanoes and ocean trenches.



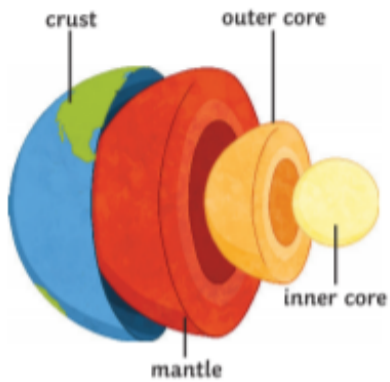
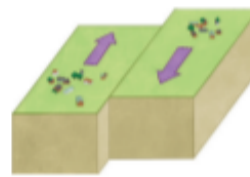
Constructive Margins

Where two plates move away from each other. Magma will create new crust.



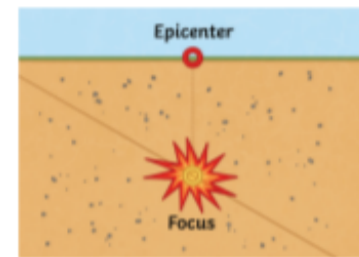
Conservative Margins

Where two plates slide along each other. No crust is created or destroyed. This can cause earthquakes.



What Is an Earthquake?

When the plates jerk past each other they send out shock waves from the focus. The epicentre is directly above the focus on the earth's surface.



Management can Reduce the Effects of Hazards

Scientists can monitor tectonic activity, e.g. seismometers can monitor earth movements and equipment can measure escaping gas.

Volcanic activity can be predicted and people can evacuate. Predicting earthquakes is less accurate but people can prepare for them if they live in an area at risk. Buildings can be designed to use reinforced concrete and strengthened foundations. Gas and electricity supplies can have automatic shut-offs to prevent fires.

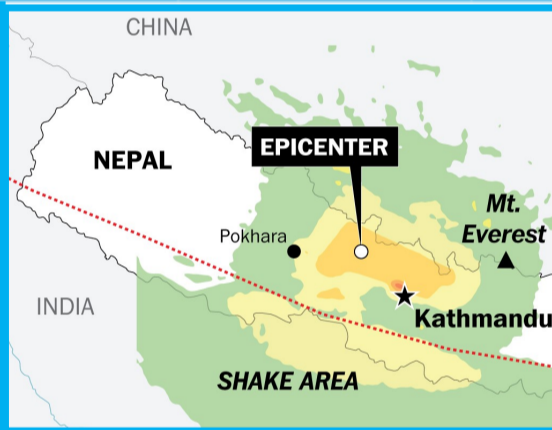
Areas at risk can plan to reduce the risk by training and educating people.

- The strength of an earthquake is called its magnitude. Magnitude is measured on a logarithmic scale (e.g. a magnitude 4 earthquake is 10 times stronger than a magnitude 3 earthquake).
- Earthquakes of magnitude 7 and above can cause serious damage and death.



Case Study: Chile Earthquake 2010

When: 27th February 2010
 Magnitude: 8.8 on the Richter Scale
 Plate Boundary Type: Destructive
 Plates Involved: Nazca and South American



Case Study: Nepal Earthquake 2015

When: 25th April 2015
 Magnitude: 7.9 on the Richter Scale
 Plate Boundary Type: Destructive
 Plates Involved: Indo-Australian and Eurasian

Why do People Live Near Tectonic Hazards?

- Minerals in volcanic ash produce fertile soil. Crops will grow well.
- Jobs, e.g. Los Angeles is in an area at risk of earthquakes.
- People are confident that the government will help.
- Families have always lived in the area.
- Volcanoes attract tourists. There will be lots of jobs in the tourism industry.

Immediate Responses are those which happen straight away to save lives.

Case Studies:

LIC Nepal

- Search and rescue teams sent from the UK, China and India.
- Half a million tents provide shelter.
- Rescue helicopters sent to stranded climbers on Everest.
- 300 000 people migrated from Kathmandu to seek help from family and friends.

HIC/NEE Chile

- International aid supplied satellite phones and field hospitals.
- Floating bridges allowed aid to be transported to remote areas.
- Power restored to 90% of homes in 10 days.
- \$60 million raised in a national appeal.
- Repairs made to Route 5 to move aid from Santiago.

Long-Term Responses are those which happen in the weeks and months after the event.

Case Studies:

LIC Nepal

- Roads repaired and landslides cleared.
- 7000 schools rebuilt.
- Heritage sites reopened to support tourism.
- Everest base camp rebuilt and climbing routes opened to tourists.
- \$126 million in aid from UK.

HIC/NEE Chile

- 200,000 homes rebuilt a month after the earthquake.
- Copper industry rebuilt to improve the economy and allow the return to work for many.
- Ports and buildings were reconstructed over a four year period.

Nepal 2015	Chile 2010	Nepal 2015	Chile 2010
9000 people died	500 people killed	Landslides blocked roads	Tsunami wave was triggered, flooding coastal towns
20,000 injured	12,000 injured	Avalanches triggered on Mt. Everest (19 died)	1500km roads damaged by landslides
3 million homeless	220 000 homes destroyed	Kali Gandaki River flooded due to landslides blocking the river channel.	Fire at a chemical plant in Santiago leading to an evacuation.
7000 schools destroyed	Santiago airport damaged		
Food shortages as 50% of shops were destroyed	4500 school damaged		
\$5 billion damage	\$30 billion damage		

