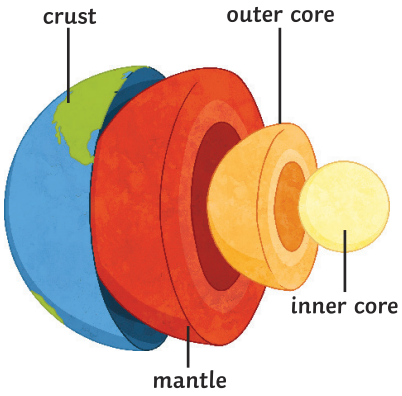
# The Challenge of Natural Hazards **Tectonic Hazards Knowledge Organiser**

- 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.

## Earthquakes and Volcanic Eruptions

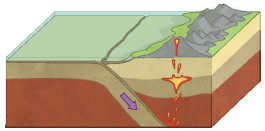
- The crust is divided into tectonic plates.
- They move because of convection currents in the mantle.
- The plates meet at plate boundaries.




There are different types of plate boundaries:

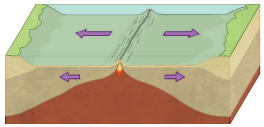
**Destructive Margins**

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.



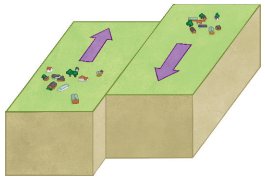
**Constructive Margins**

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.



## Management can Reduce the Effects of Hazards

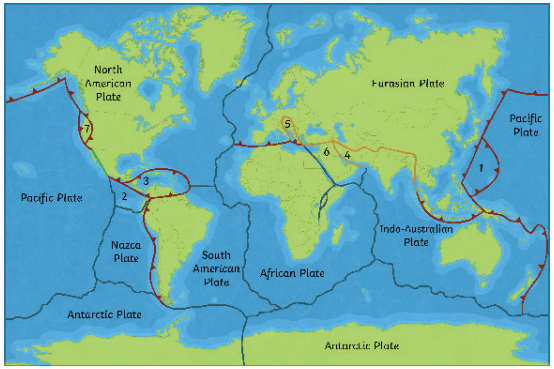
Scientists can monitor tectonic activity, e.g. seismometers can monitor earth movements and equipment can measure escaping gas.

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.

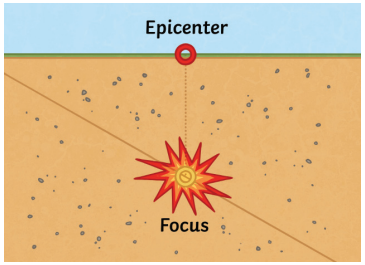
## Global Distribution

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




## 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.




- 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.

## 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.

## Primary Effects
(Immediate Impacts)

### Primary Effects of Volcanoes

- People and animals injured/killed
- Buildings and farm land destroyed
- Water supplies contaminated
- Volcanic ash prevents air travel

### Primary Effects of Earthquakes

- Buildings collapse.
- Roads, railways, bridges etc destroyed
- Water/gas pipes and electricity cables are damaged
- People are injured/killed

## Secondary Effects
(Happen Afterwards)

### Secondary Effects of Volcanoes

- People are left homeless
- Damaged transport routes prevent aid reaching the area
- Melting ice can cause flooding
- The negative effects to businesses can cause unemployment/ poverty
- Volcanic ash creates fertile farm land
- Tourism can increase
- Crops can be damaged
- Ash contaminates water supplies

### Secondary Effects of Earthquakes

- People are left homeless
- Damaged transport routes prevent aid reaching the area.
- Tsunamis and landslides (lahars) can be triggered
- Broken gas pipes cause fire
- The negative effects to businesses can cause unemployment/ poverty
- Lack of clean water/ medical care can cause disease and death

## Immediate Responses

- Warnings and evacuation if possible
- Rescue teams search for survivors/ recover bodies
- Treat injuries
- Put out fires
- Provide shelter, food, water and medical supplies
- Aid from other countries/aid agencies
- Temporary shelters/water/electricity supplies

## Long Term Responses

- Rebuild/repair damage
- Restore utilities
- Improve building regulations
- Promote economic recovery
- Rehome homeless people
- Improve monitoring/prediction/ warnings

## Tectonic Hazards in Areas of Contrasting Wealth

### L'Aquila, Italy (6th April 2009)

- Magnitude 6.3
- 300 deaths, 1500 injured.
- 60 000 homeless.
- Most electricity was restored within one day.
- 20 000 were re-housed in new settlements.
- Most of the city centre has been rebuilt.
- An investigation criticised the recovery operation.

### Nepal (25th April 2015)

- Magnitude 7.8
- 9000 deaths, 23 000 injured.
- Over 50 000 homes destroyed.
- Red Cross tents housed 225 000 people.
- International aid including $126 million (US dollars) from the UK's DEC (Disasters Emergency Committee) fund.
- Feared outbreak of Cholera never happened.