THE CHALLENGE OF NATURAL HAZARDS: TECTONIC HAZARDS

WHAT AFFECTS HAZARD RISK?

Poverty: Land is cheaper in risky places.
Urbanisation: People may be forced to live on steep slopes or flood plains.
Farming: Farmers choose to live on floodplains or volcano slopes because of fertile land.
Climate change: More extreme weather events in the future.

PLATE TECTONIC THEORY

Continental drift: Crust broken into plates that move (Wegner) – used to be one 'super-continent' – Pangea.
Convection currents: Theory that plates moved due to movement of magma in the mantle (widely discredited now).
Ridge push: New crust formed at constructive margins rises to form ocean ridges – older seafloor on either side slides away.
Slab pull: At subduction zones older denser plates sink into the mantle – pulling newer/less dense bits of plate with it.

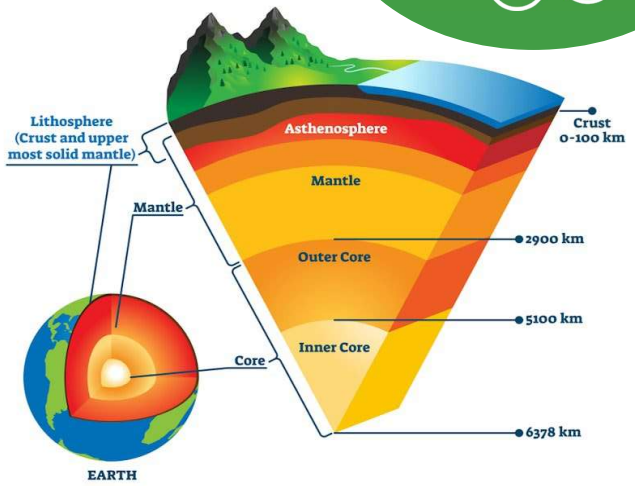
LAYERS OF THE EARTH

Crust: Thinnest outermost layer.
Mantle: Thickest layer (approx. 2,900km).
Core: Inner core is solid; outer core is liquid.
Lithosphere: ***The crust and upper (rigid) part of the mantle).***
Asthenosphere: ***Denser weaker layer of the mantle (100-400km below Earth's surface) – semi-molten.***

TYPES OF CRUST

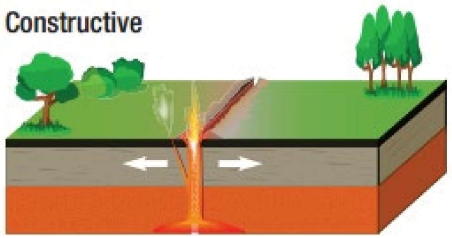
Continental:
- 20-200km thick
- Less dense
- Mainly granite
- Up to 3.8 billion years old

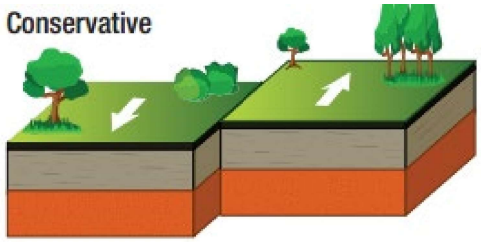
Oceanic:
- 5-10km thick
- Very dense
- Mainly basalt
- Less than 200 million years old



TYPES OF PLATE MARGIN (BOUNDARY)

Destructive: When continental and oceanic plates move towards each other. The denser oceanic plate is subducted under the continental plate forming an ocean trench, and the continental plate folds to form mountains – earthquake and volcanoes occur here.
Constructive: When plates move apart magma rises to the surface and cools to form new land, e.g. a mid-ocean ridge, which can cause volcanoes and earthquakes.
Conservative: When two plates slide past each other, either in opposite directions, or in the same direction but at different speeds. The plates can stick and jolt free causing earthquakes. There is no rising magma so no earthquakes.





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PRIMARY IMPACTS

The direct impacts (caused either by the earth shaking or a volcano erupting) – they happen during or immediately after the event, e.g. loss of life and numbers injured, buildings destroyed, transport infrastructure damaged, water/gas pipes breaking, electricity cables falling down; volcanoes – ash clouds covering everything, lava/ash contaminating water supplies.

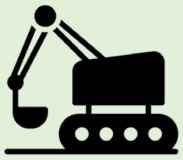
SECONDARY IMPACTS

The indirect impacts (caused by the primary impacts) – they happen in the coming hours, days and weeks, e.g. tsunamis and landslides, communities being cut off (from damaged roads), outbreaks of waterborne diseases (from contaminated water), fires and power cuts (from broken cables).
BUT, also increase in tourism after volcanic eruptions, e.g. Iceland.

IMMEDIATE RESPONSES

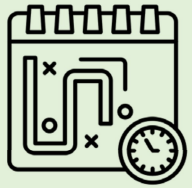
Emergency aid/ assistance given within the first few hours/days – vital to reduce death toll, e.g. search and rescue, medical care such as pain relief and emergency surgery, temporary shelter, providing food and clean water.

LONG-TERM RESPONSES



Take place in the weeks and months after – focus on rebuilding and helping people return to normal lives, e.g. restoring essential utilities, repairing/ rebuilding domestic and commercial buildings, repairing transport links. Also measures to reduce future damage.

MITIGATING TECTONIC HAZARDS – MP3



Monitoring: Using scientific equipment to detect warning signs, e.g. measuring changes in temperature and bulges in the volcano dome as magma rises, monitoring seismic Activity.

Prediction: Using historical evidence/live data to estimate when a tectonic hazard might happen, e.g. historical records show where earthquakes might occur, particularly if pressure is building up after no recent activity.

Protection: Designing buildings/structures to withstand tectonic hazards, e.g. shock absorbers at the base of tall buildings to make them sway, cross-bracing and automatic window shutters.

Planning: Identifying and avoiding places most at risk and preparing for a disaster, e.g. drawing up hazard maps, setting up 'no-go' areas, practising earthquake drills, stocking up on food, water and fuel, and knowing where to evacuate to.

WHY LIVE IN TECTONIC AREAS?

Geothermal energy: Hot magma in rocks heats up steam – used to drive turbines at power stations.

Mining: Volcanic are rich in minerals – valuable resources and creates jobs.

Farming: weathered lava releases minerals – nutrient-rich soil.

Tourism: Tourists visit to see eruptions, geysers and relax in hot springs.