Geography Revision

Tectonic Hazards

Tectonic Plates

The Earth’s crust is divided into slabs called tectonic plates. These plates float on the mantle (an area of semi molten rock) and are moving because of convection currents in the mantle. Plates are made of two types of crusts:

* Continental Crust – Is 30-50km thick, and not as dense
* Oceanic Crust – 5-10km thick, and dense

The places that these plates meet are called plate margins.

Types of Plate Margins

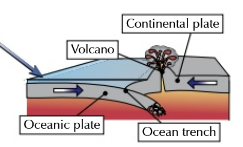
There are three main types of plate margins. Different geological features can form at different plate margins.

* Destructive Plate Margins – Two plates moving towards each other. When two continental plates meet, fold mountains are formed. When an oceanic and continental plate meet, the oceanic plate is forced underneath the continental plate and is destroyed. Volcanoes and undersea trenches are formed here.
* Constructive Plate Margins – Two plates moving away from each other. Magma flows out of the gap, creating new crust.
* Conservative Plate Margins – Two plates moving sideways past each other or moving in the same direction at different speeds. Crust is not created or destroyed.

Earthquakes

Earthquakes can occur at all 3 main plate margins and are caused by the tension that builds up:

* Destructive Margins – Tension builds when one plate gets stuck as it moves past the other.



* Constructive Margins – Tension builds in cracks on the plates as they move away from each other

Diagram, schematic

Description automatically generated

* Conservative Margins – Tension builds when two plates which are moving past each other get stuck.

A picture containing diagram

Description automatically generated

The stuck plates eventually jerk past each other, sending out vibrations as shock waves. These shockwaves are the earthquake.

Shockwaves spread out from the focus (where the earthquake starts). The epicentre is the point on the Earth’s surface directly above the focus. Earthquakes are measured using the moment magnitude scale. It is a logarithmic scale (like decibels), so a magnitude 7 earthquake is 10x more powerful than a magnitude 6.

Volcanoes

Volcanoes can form in 3 conditions:

* Destructive Margins – The denser oceanic plate moves under the continental plate, and melts. Magma forms, which reaches the surface through vents and erupts, forming a volcano. Note – magma is called lava when it reaches the surface.
* Constructive Margins – Magma rises up through the gap as plates move apart. This magma forms a volcano.
* Hotspots – Volcanoes can also form away from plate margins, on areas where the crust is very hot (Eg Hawaii).

When a volcano erupts, it releases lava and toxic gases. Some volcanoes also release ash, which can cover the land and sun, and create pyroclastic flows (superheated currents of gas, ash, and rock).

Tectonic Hazards in Contrasting Countries (Chile and Nepal)

Chile is a High-Income Country (HIC) with a GPD of $298.2 billion which makes it 38th highest in the world. Nepal is a Low Income Country (LIC) with a GPD of $29.04 billion.

|  |  |  |
| --- | --- | --- |
| Location | Chile | Nepal |
| GDP | $298.2 Billion | $29.04 Billion |
| HDI | 41st | 145th |
| Date | 27th Feb 2010 | 25th April 2015 |
| Magnitude | 8.8 | 7.9 |
| Plate Margin | Destructive | Collision |
| Epicentre | Off the Coast | Centre of Nepal |
| Damage | $30 Billion | $5 Billion |
| Deaths | 500 | 9,000 |
| Injuries | 12,000 | 20,000 |
| Affected | 800,000 | 8,000,000 |
| Homeless | 220,000 | 1,400,000 |
| Tsunami | Yes | No |

Chile Earthquake - Effects

|  |  |
| --- | --- |
| Primary | Secondary |
| * 500 people killed and 12,000 injured * Hospitals, school, and airports damaged * Water, electricity, and communications lost in most areas * Damages of approximately $30 Billion | * Landslides damaged 1500km of roads, cutting off rural communities for weeks. * A tsunami was caused by the earthquakes, which also hit other nearby countries. * Fires broke out in many buildings due to burst gas pipes |

Nepal Earthquake – Effects

|  |  |
| --- | --- |
| Primary | Secondary |
| * 9,000 people killed and 20,000 injured * 3 million people left homeless * 1.4 million people in need of food and water * Damages of approximately $50 Billion | * Avalanches on Mt. Everest killed at least 19 people * Landslides blocked rivers, people were evacuated to avoid potential flooding * No tsunami – the earthquake occurred on land |