

PLATE TECTONICS.

Adapted from Monica Fuentes's *the earth's relief*
Source: Slideshare.



WORLD-TREKKER'S

Your way to get along arround the Globe. 1 ESO.

Prf. Jn Grimal.



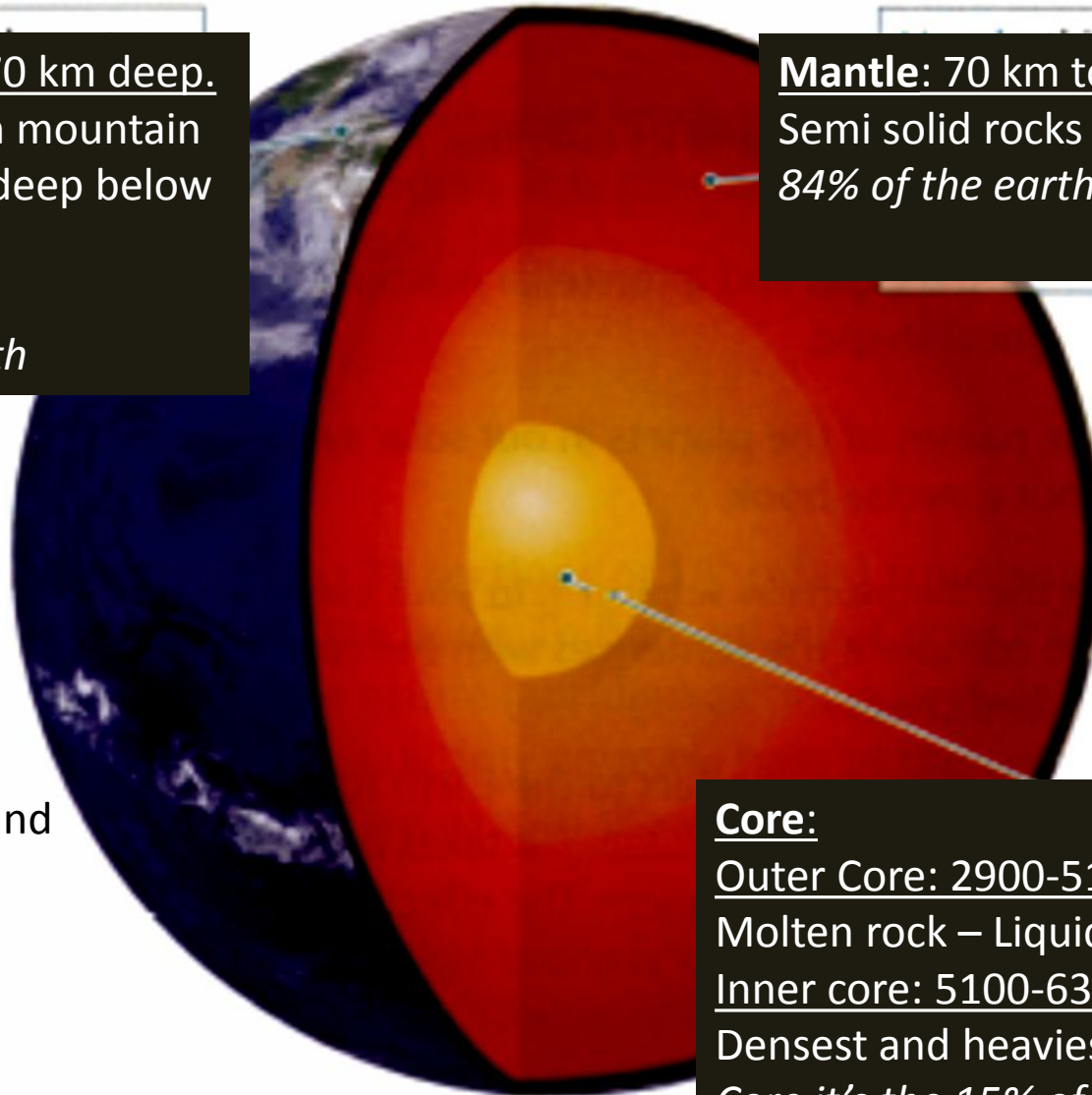
1. THE EARTH'S STRUCTURE: 3 concentric layers.

Crust : 10 to 70 km deep.
70 km deep in mountain areas, 10 km deep below the oceans.
Solid
1% of the earth

Mantle: 70 km to 2900km deep.
Semi solid rocks =Magma.
84% of the earth

Upper mantle and crust form the LITHOSPHERE

Core:
Outer Core: 2900-5100 km deep.
Molten rock – Liquid.
Inner core: 5100-6378 km
Densest and heaviest rocks – Solid.
Core it's the 15% of the earth



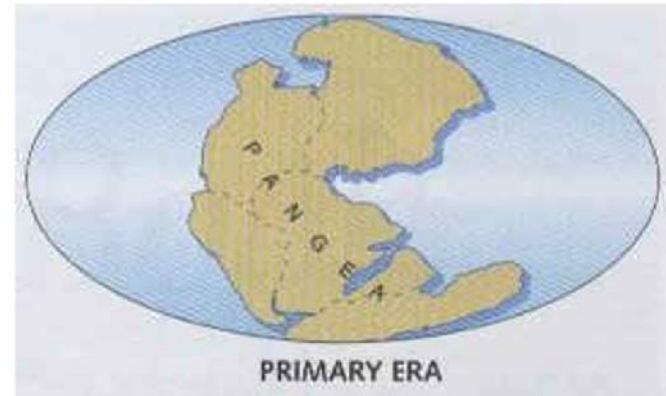
2. Tectonic plates.

The theory of continental drift

Scientists believe that 200 million years ago the continents were connected in one single called PANGAEA.

The theory is that this continent broke up into fragments of tectonic plates to make the continents we have today.

Theory of continental drift



What are Tectonic Plates?

- The Earth's crust is divided into large blocks called plates. The heat inside the Earth creates currents which move the plates around.
- **Oceanic plates** carry the oceans.
- **Continental plates** carry the continents.

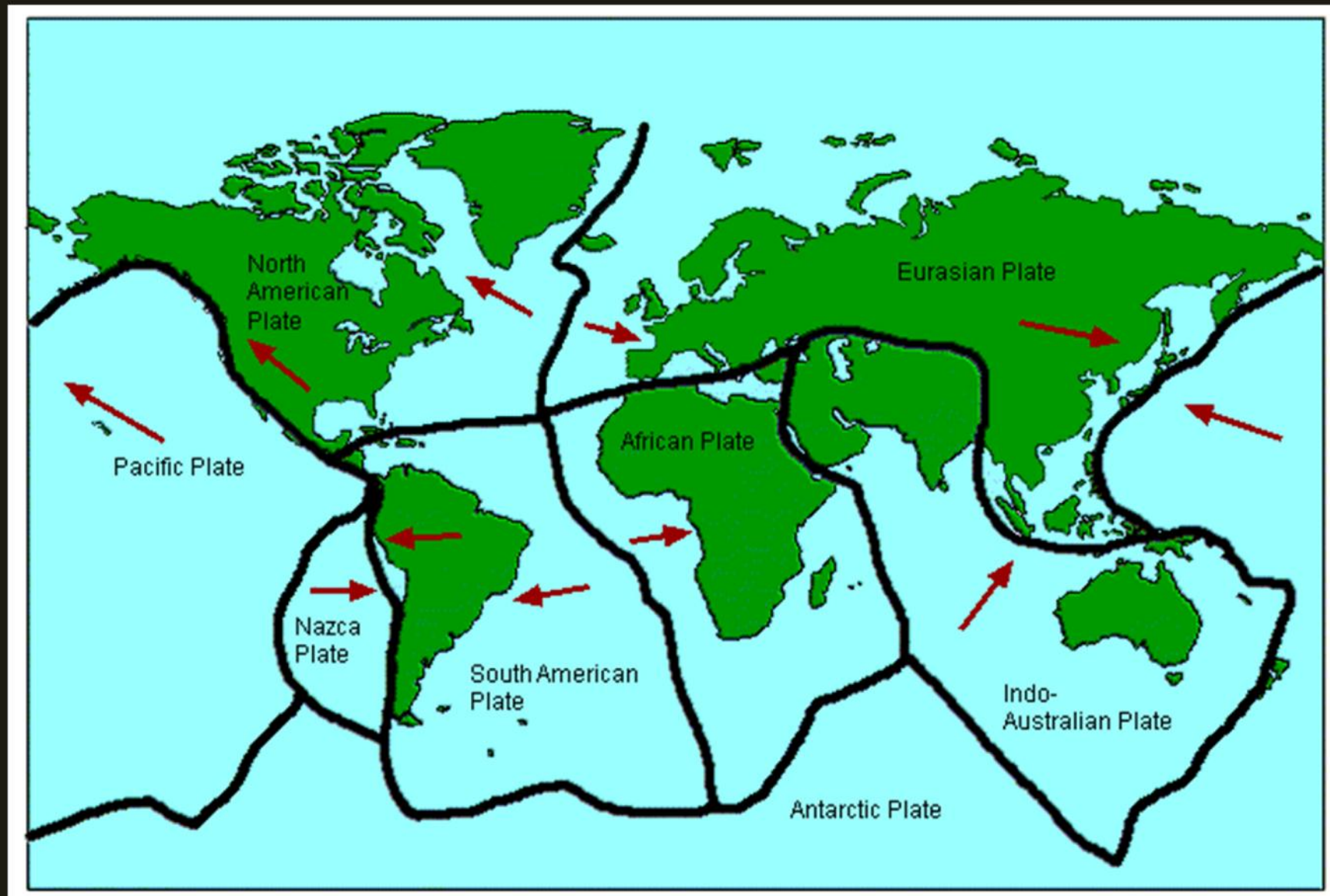


The movement of plates is called **Plate Tectonics**

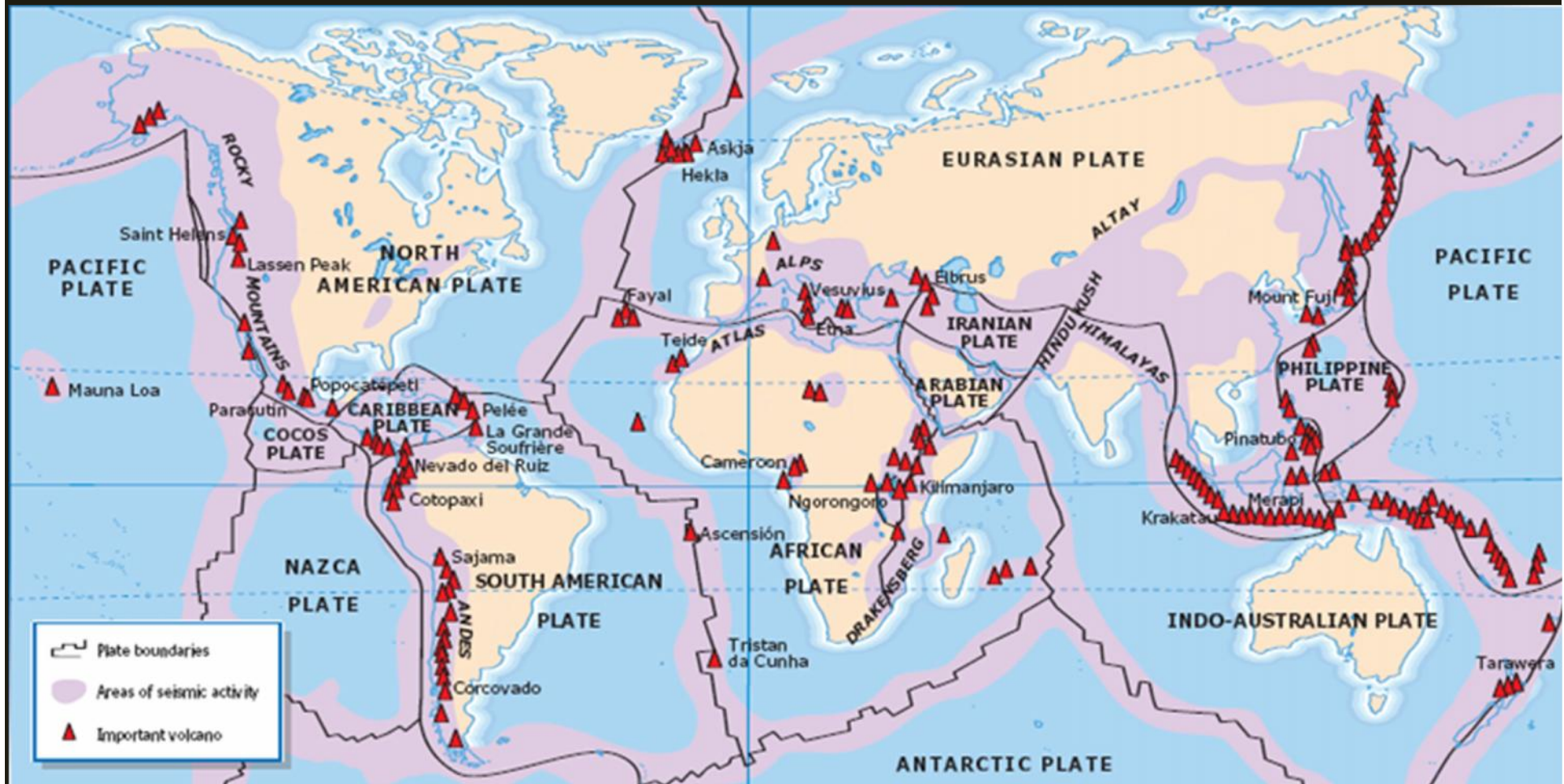
PANGAEA → TODAY'S CONTINENTS



The earth most important plates and oceanic ridges.



The earth most important plates and oceanic ridges.

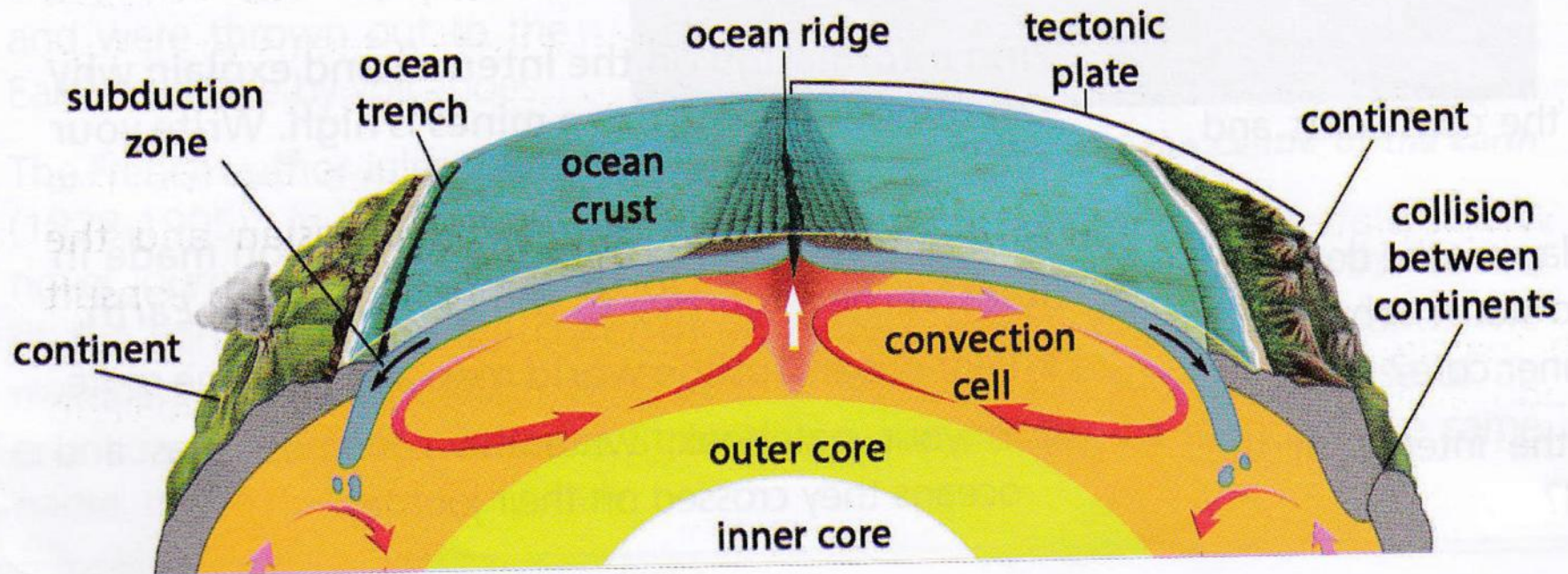


What happens where plates meet?

The places where plates meet are called **plate margins or boundaries**. It is often in these places that the Earth is **unstable** resulting in *earthquakes and volcanoes*.



The *tectonic plates* lie on top of the *mantle*, which is semi-solid state. The tectonic plates move over the mantle slowly and continually, over millions of years. During this movement, *plates collide and separate*.



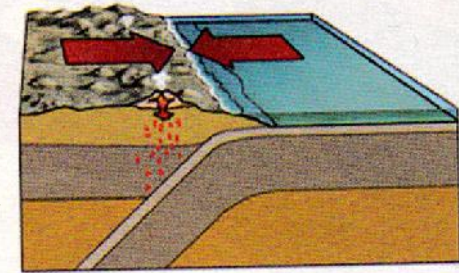
Boundaries between tectonic plates can be of three types.

1. Destructive plate boundaries (plates crash) create mountains and may give rise to volcanoes and earthquakes. Ex. The Andes.

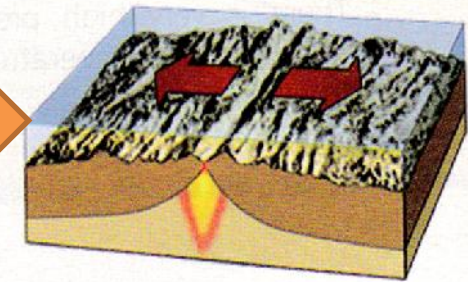
2. Constructive plate boundaries (plates separate) create new crust such as islands because magma rises through fissures, and often give rise to volcanoes and earthquakes. Ex. Iceland

3. Conservative plate boundaries do not create or destroy land, but often give rise to earthquakes (not volcanoes).

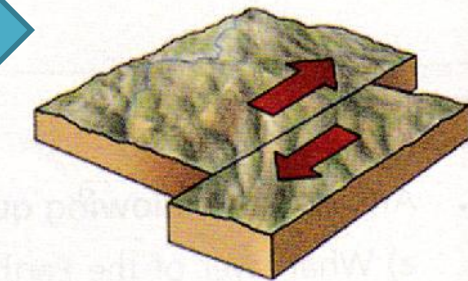
When the plates move, they interact in three basic ways:



They collide with each other.



They separate from each other.

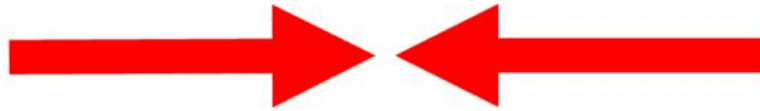


They slide past each other.

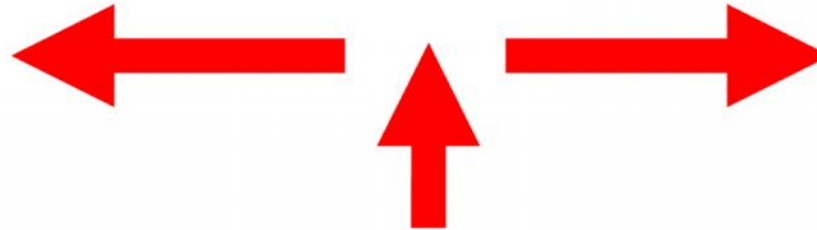
Plate Margins.

Write in sentences and use a ruler.

1. Copy the arrows into your book and explain how destructive plate boundaries move.



2. Copy the arrows into your book and explain how constructive plate boundaries move.



3. Copy the arrows into your book and explain how conservative plate boundaries move.



3. FORCES IN THE FORMATION OF THE RELIEF

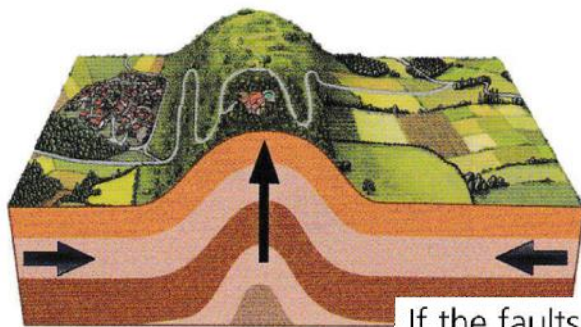
3.1 INTERNAL FORCES

OROGENIES

The movements of the tectonic plates creates the process called **orogeny**. Orogeny creates large units of relief such as **mountain ranges** and **plateaus**.

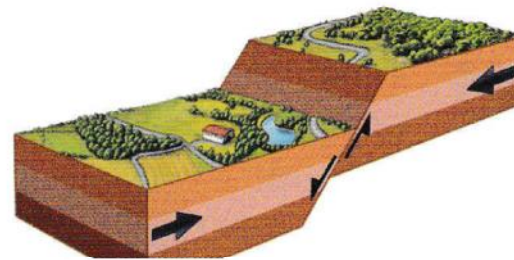
The results of orogeny vary, depending on the characteristics of the rocks:

- When the rocks are flexible, they deform, creating **folds**.
- When the rocks are very hard, they break apart when pushed. These break lines are called **faults**.



Fold

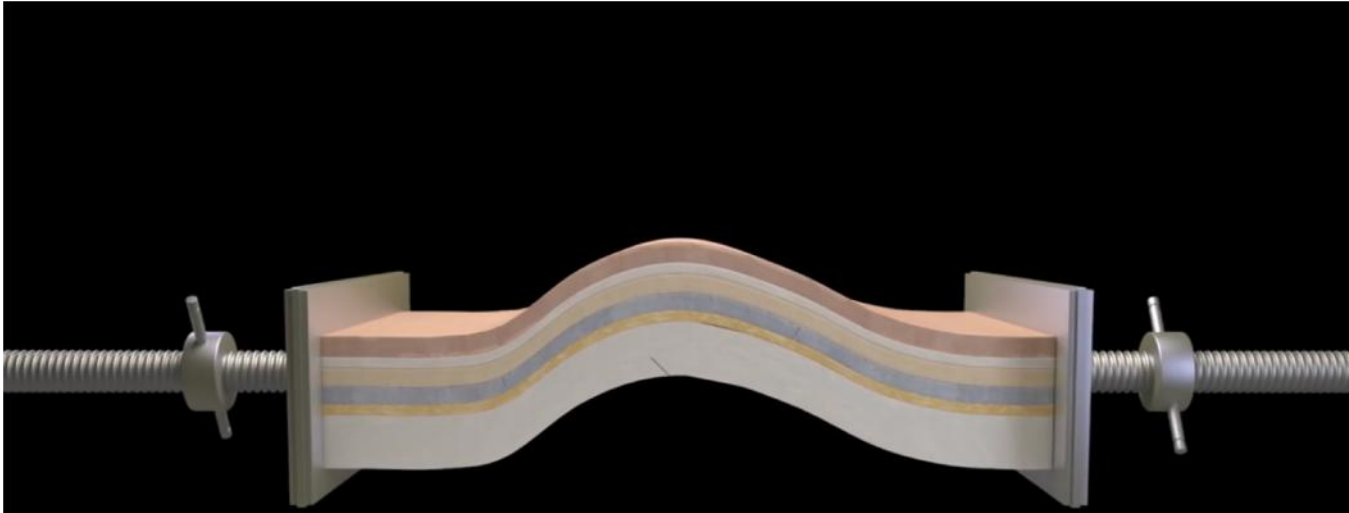
Most mountain ranges are f



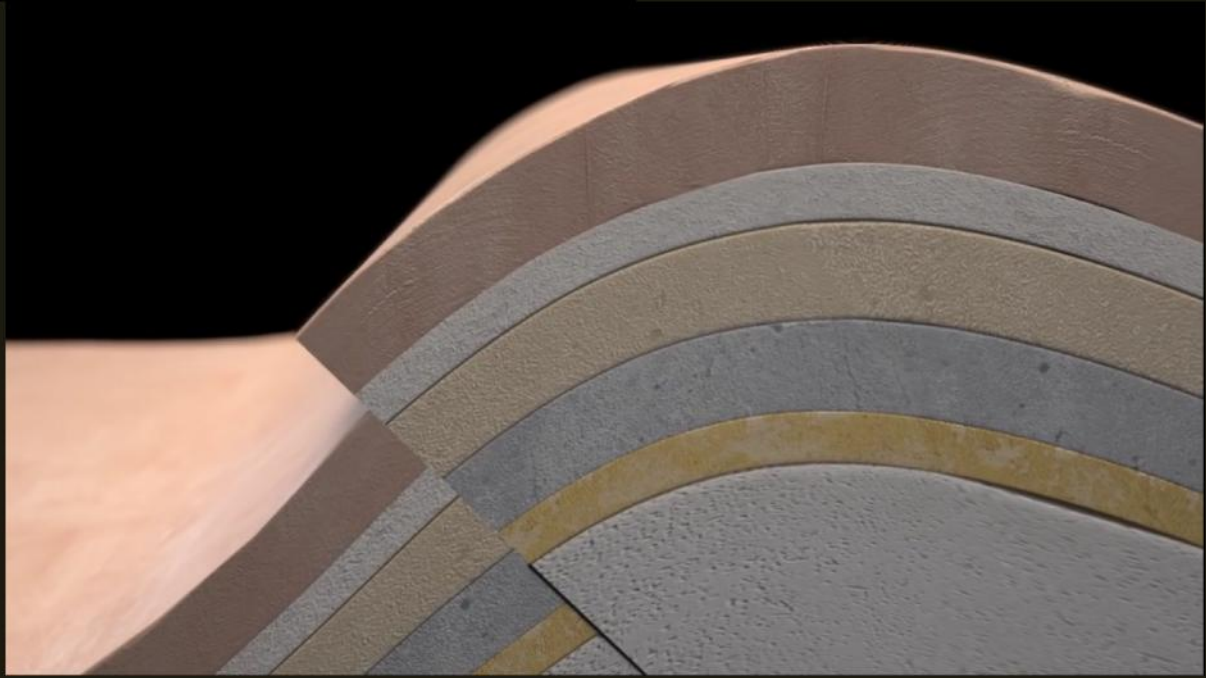
If the faults are very deep, the fracture can penetrate the crust or the mantle, where magma is found. Magma can rise to the surface through these fractures, forming **volcanoes**, which emit ash and **lava** (magma which comes from the Earth's interior).

Earthquakes occur when two sides of a fault collide or separate. The areas with the most volcanoes and strongest earthquakes are areas close to plate boundaries where tectonic plates meet or separate.

FOLD



FAULT

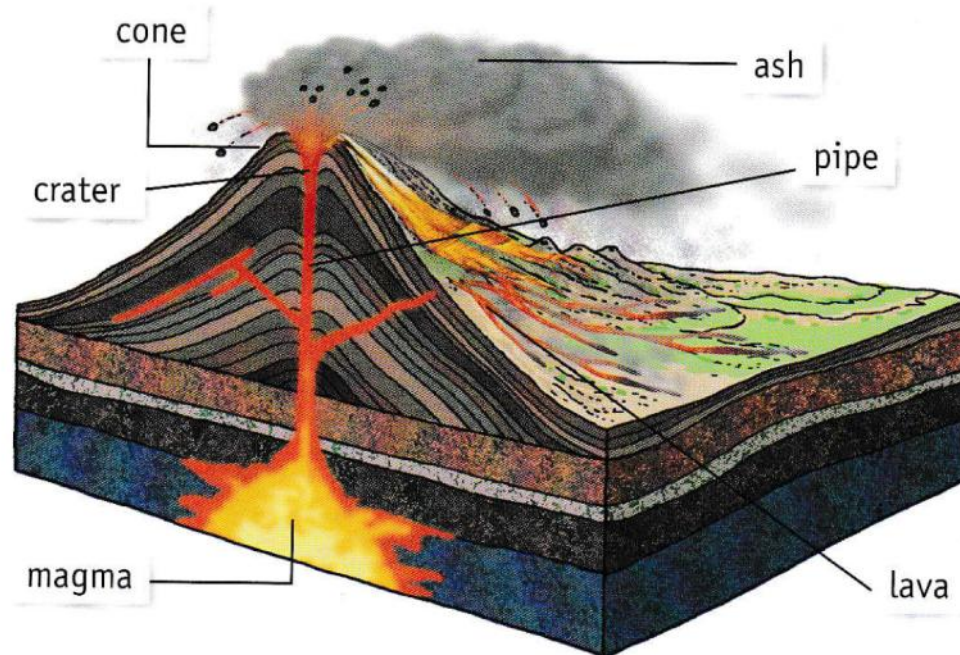


VOLCANOES

Cracks in the Earth's crust can be deep enough to reach areas where there is **magma**. The magma rises and passes through the volcano's **crater** to the surface in a **volcanic eruption**. Volcanic eruptions expel **gases, ash, rocks** and **lava**. When these come into contact with the air, they form a volcanic cone.

Some volcanic cones can be as high as mountains, such as Teide on Tenerife. After an underwater eruption, the resulting cone can make a new island, like La Graciosa in the Canary Islands.

STRUCTURE OF A VOLCANO



EARTHQUAKES

Earthquakes are the result of the movement of the Earth's tectonic plates. This movement travels in all directions in the form of **seismic waves**. The effect is the same as throwing a stone into a lake.

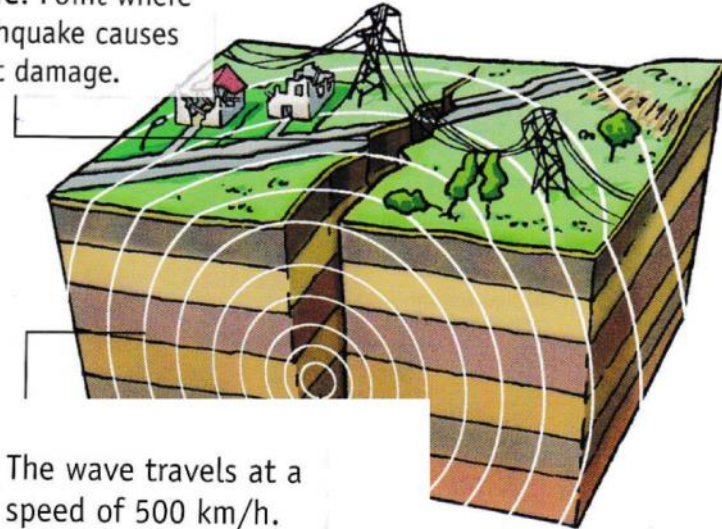
Earthquakes usually last for only a few seconds, but they cause the ground to shake and can have devastating effects.

Earthquakes can be of different intensities and magnitudes. A seismic wave from an earthquake's magnitude is measured on the Richter scale.

When an earthquake happens under the sea, it can cause a **tsunami**, which is a series of waves produced by the force of the earthquake.

AN EARTHQUAKE

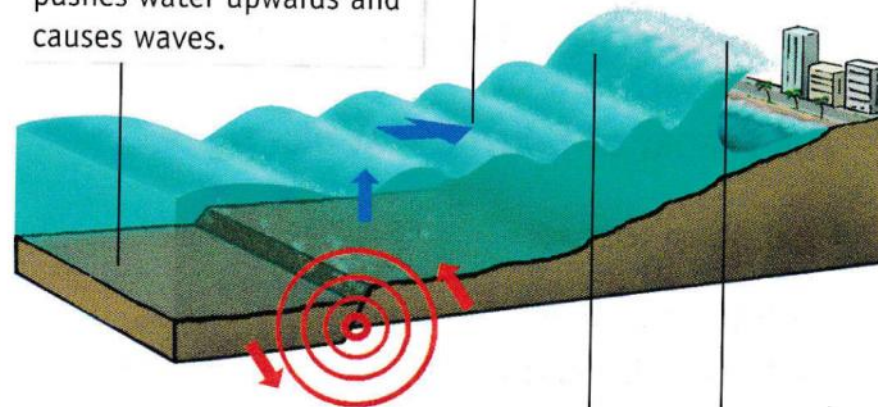
Epicentre. Point where the earthquake causes the most damage.



A TSUNAMI

A rupture on the seabed pushes water upwards and causes waves.

The wave travels at a speed of 500 km/h.



When the wave approaches the coast, it slows down to 45 km/h, but it gets taller.

The wave reaches the coast and destroys everything in its path.

gin
e.