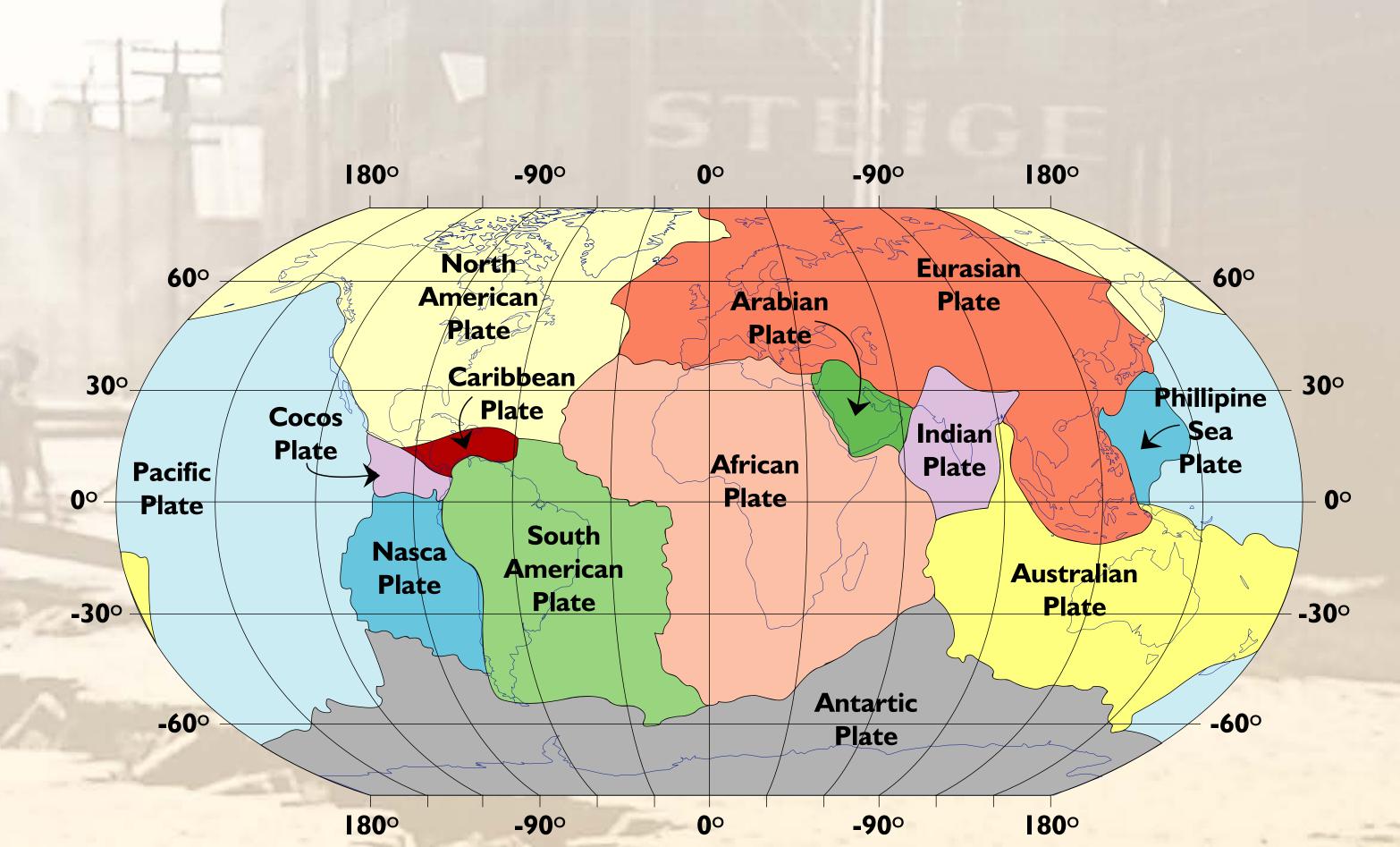
# Plate tectonics, earthquakes and volcanoes



ly be observed that the tectonic processes. distribution of the vast

Have you ever noticed majority of both earththat earthquakes occur quakes and volcanoes in specific areas? Have around the globe show you ever seen the pla- a very definite pattern, net's volcanoes on the which has been proven world map? It can easi- to reflect the Earth's

In fact, earthquakes and volcanic eruptions mostly occur along the margins of the Earth's so-called tectonic or lithospheric plates. Due to the plates' constant motion, rocks along their margins break and move, generating earthquakes. At the same time, magma rises to the surface, giving birth to volcanoes.

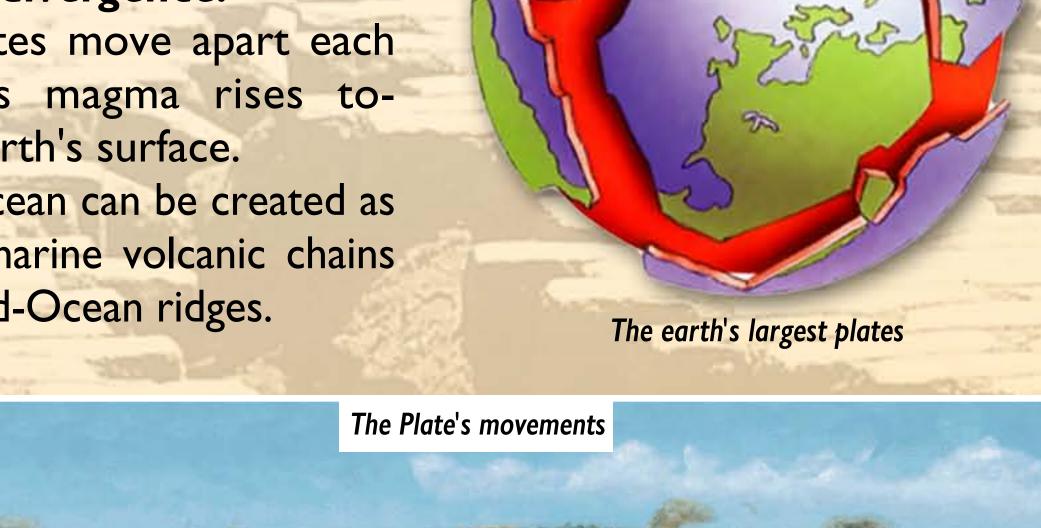
#### Plate movements:

Plates can present mainly three types of displacements:

#### 1. Plate divergence:

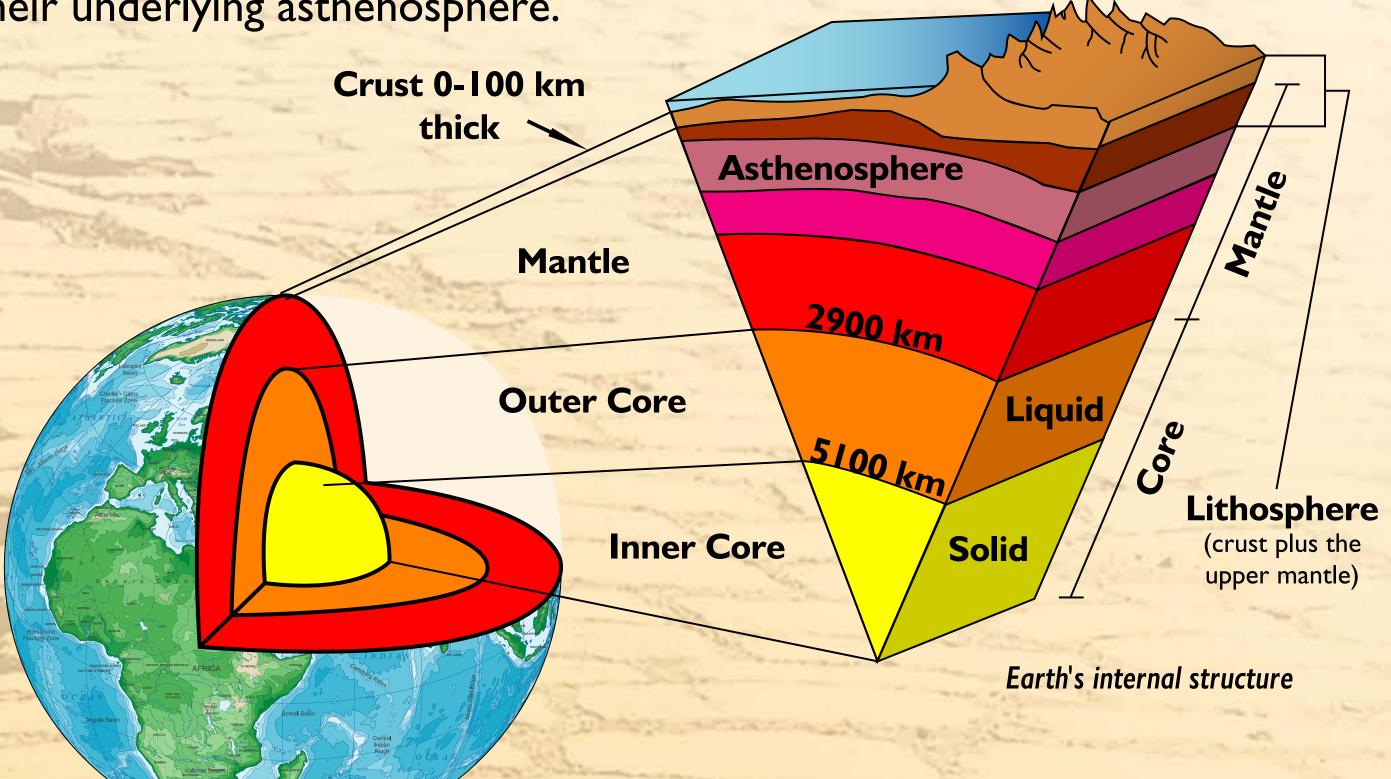
Two plates move apart each other as magma rises towards earth's surface. A new ocean can be created as well as marine volcanic chains called Mid-Ocean ridges.

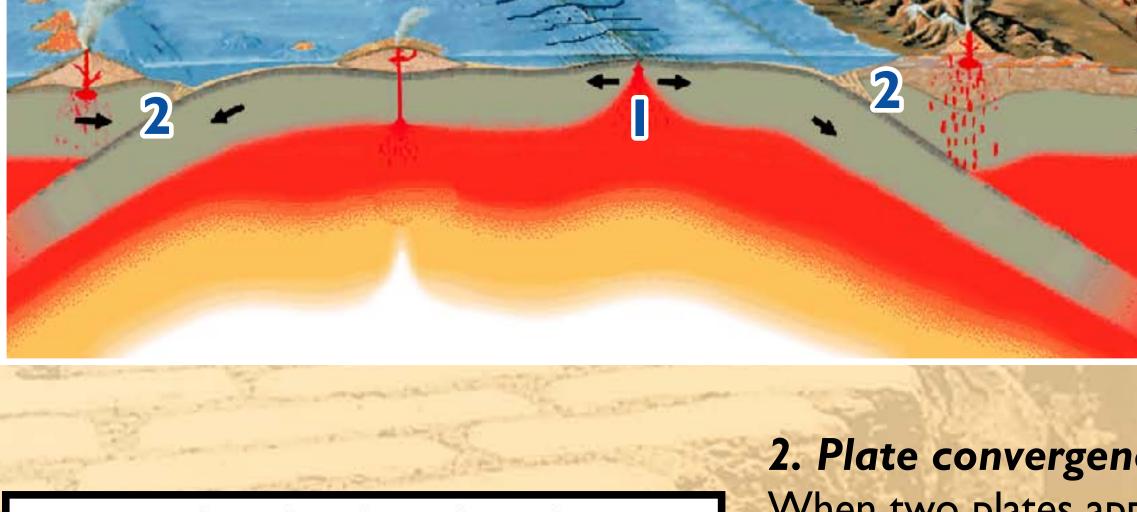




#### The Earth consists of three internal layers:

The solid crust, the viscous mantle and the metallic core, further divided in outer and inner core. The crust and uppermost mantle constitute the solid lithosphere, 80-150 km thick, which floats on top of the viscous asthenosphere. The lithosphere is divided in parts, the tectonic or lithospheric plates, moving with varying directions and speeds on the Earth's surface, driven by the movements of thermal convective currents in their underlying asthenosphere.



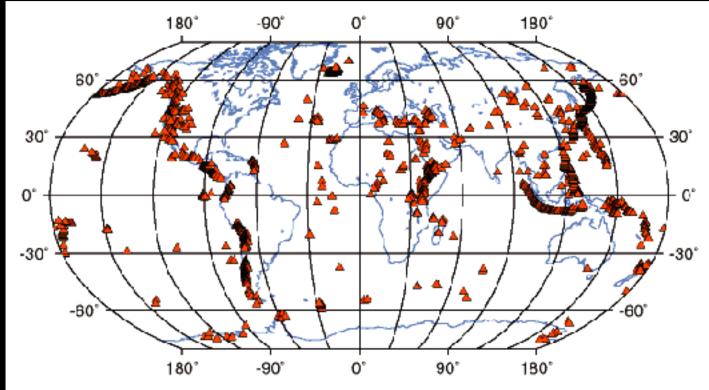


### 2. Plate convergence:

When two plates approach each other the denser has to sink under the lighter forming thus a deep trench and a subduction zone. The sinking plate melts and the rising magma forms the volcanic arc on the overriding plate. At the final stage, the two plates can collide destroying the pre-existing ocean and forming a new mountain chain (Orogenesis). Very strong earthquakes can happen at the plate's margins and at any stage of this process.



Finally, when two plates just slide next to each other without significant vertical movement, large and long Shear (or strike slip) faults are created, generating strong earthquakes.



Volcanoes in respect to plate boundaries

## How do we know about earth's interior?

Earthquakes distribution along plate's margins

The main source of knowledge regarding earth's internal structure is the seismic waves. These can travel through earth interior and depending on temperature, pressure and material's chemical properties will be transformed in new ones that will be recorded by seismographs. The analysis of these waves, compared to rock samples, deep drillings and experiments offer information on physical and chemical properties of certain areas of earth interior. Another source is the meteorites that arrive on the earth. The majority of those are considered as remnants of other planet's interiors.

