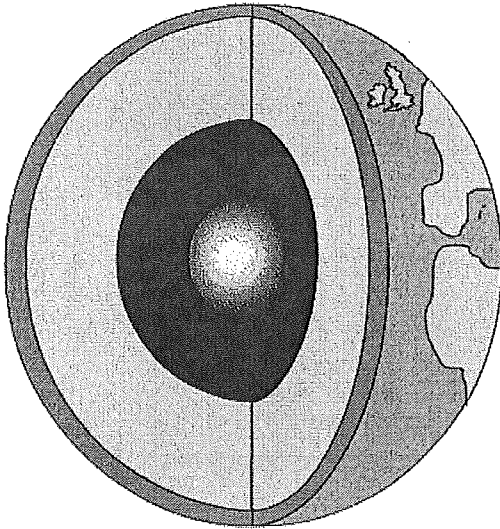


PLATE TECTONIC NOTES - Part 2

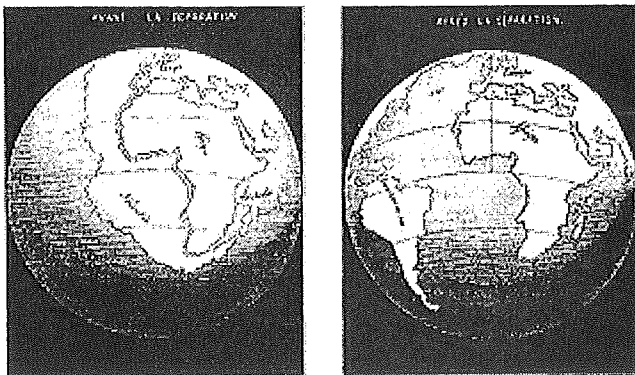
REVIEW – Label the layers of the earth:



A. Continental Drift

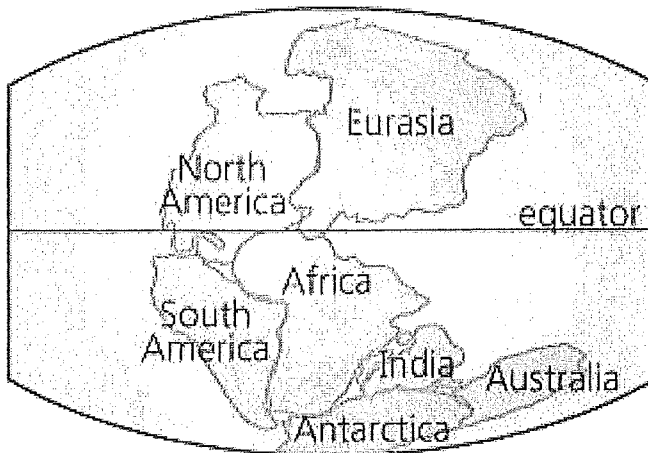
What science needed is a **unifying theory** to describe the structure of the Earth... why Earthquakes happen... why Volcanoes happen... how mountains and oceans exist...

In 1912, **Alfred** _____, a German meteorologist, had an idea. He noticed that the continents look like they can fit together like a jigsaw puzzle!



He believed that they must have originally been together, and then moved apart. They drifted away! His controversial idea was called _____!

Wegener believed that all the continents were once together in a giant supercontinent called _____.



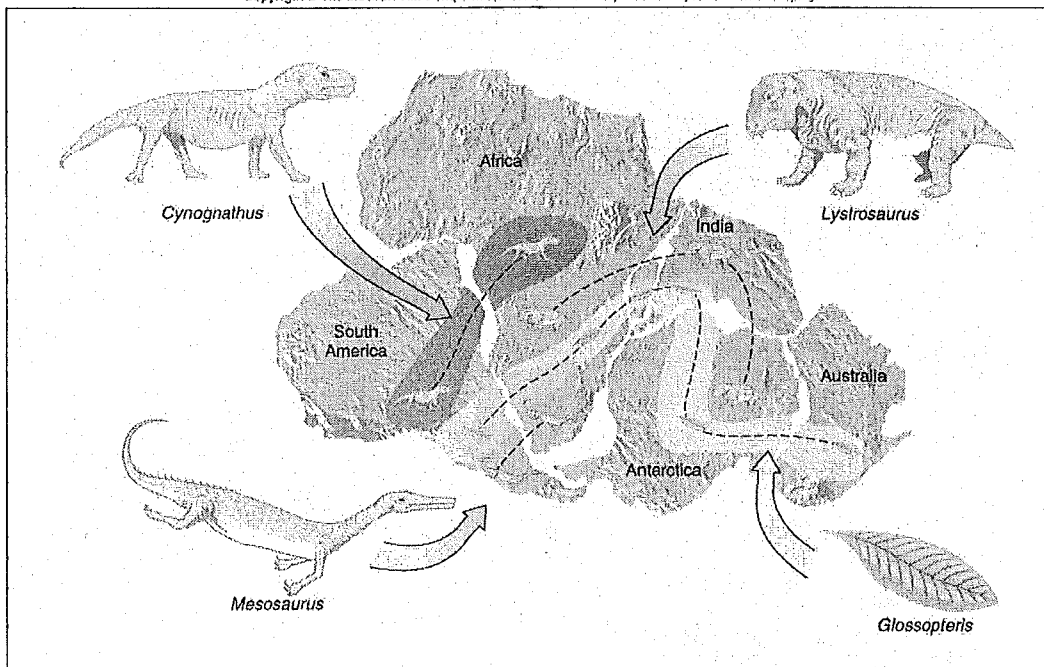
Elizabeth Morales

Evidence for Continental Drift include:

1. _____
 - The coastlines of many continents look like they were once joined.

2. _____
 - Fossils of several animals and plants were found thousands of km away.

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3. _____
- Deposits from past glaciers in South America, Africa, Madagascar, Arabia, India, Australia, and Antarctica is evidence that they were once connected!

Unfortunately, scientists **rejected** Wergener's idea of Continental Drift because the evidence wasn't strong enough. He did not have an adequate explanation as to **how** the continents traveled.

B. The Theory of Plate Tectonics

Debate over Continental Drift raged for decades, until more evidence led the way to the most ground-breaking theory in Earth Science... _____ (in 1965)!

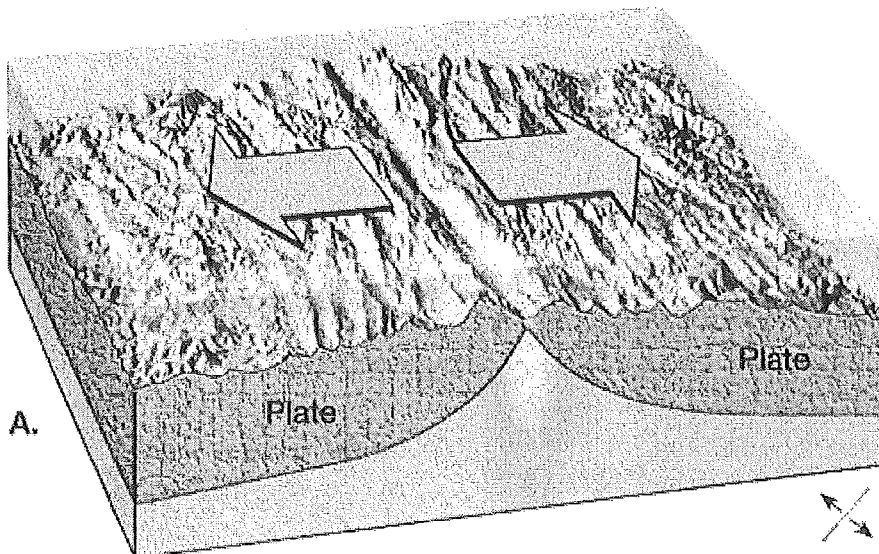
The Theory of Plate Tectonics states that:

- a. The surface of the Earth is divided into large plates.
- b. These tectonic plates are always moving.
- c. The movement at the plate boundaries create features, such as mountains, oceans, volcanoes and earthquakes.

The theory of Plate Tectonics was developed in the 1960's by combining two ideas: _____ (old) and _____ (new).

C. Seafloor Spreading

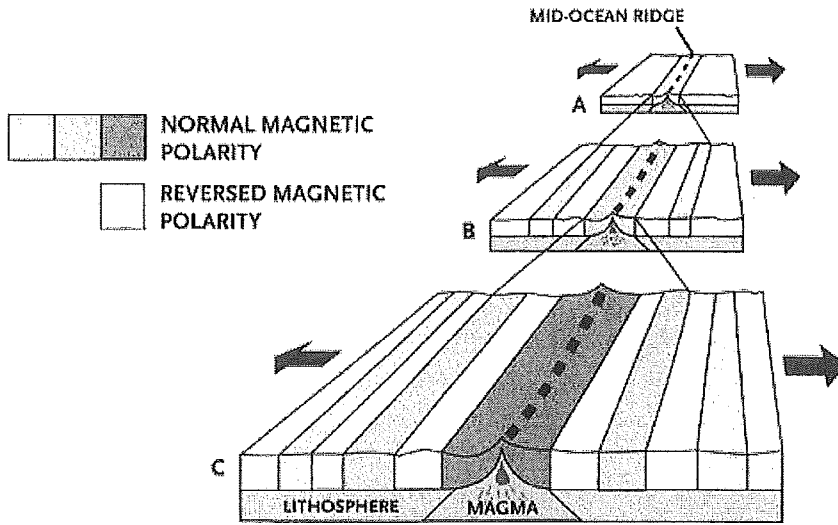
The study of the ocean floor intensified in the 1960's. Geologist and naval officer Harry Hess proposed the idea that not only do the continents drift, but the _____ does too!



Evidence for Seafloor Spreading:

1. _____
 - The igneous rocks of the seafloor get older as you move away from the spreading center (ridge).

2. _____
 - The Earth has a magnetic field generated by the flow of molten rock in the Outer Core.
 - Every so often (1-5 million years), **magnetic field reversal** happens and the direction of poles is locked into the igneous rocks when they form!
 - As the polarity reversals happen, **bands of normal polarity rocks alternate with bands of reversed polarity rocks on the seafloor.**

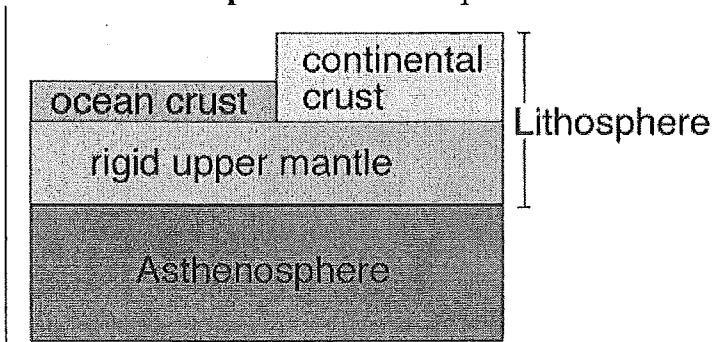


D. Tectonic Plates

a) What is a "Plate"?

-A plate is made of the _____ floating on the _____.

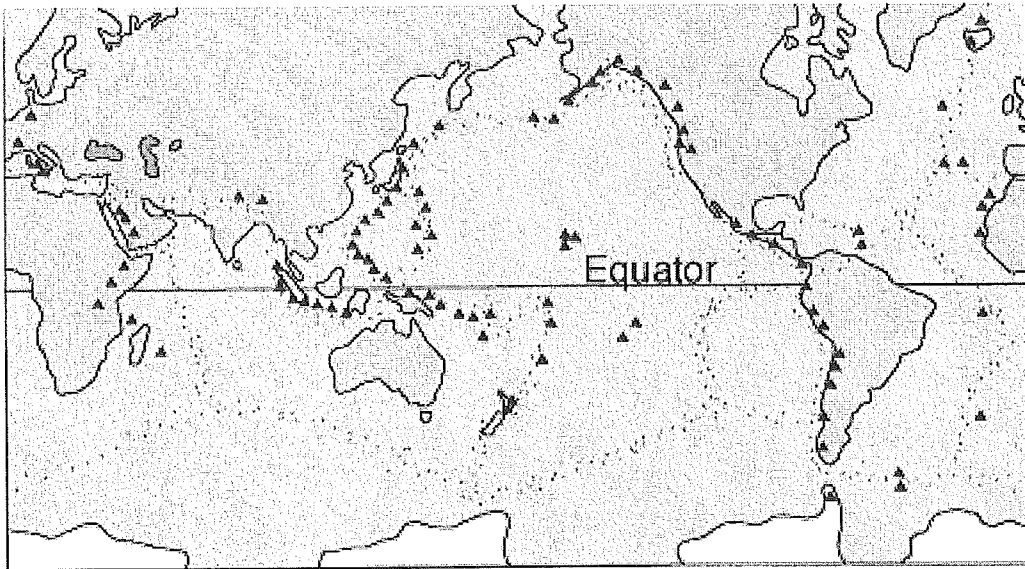
- **Lithosphere** – The Crust (oceanic or continental) and the upper rigid Mantle.
- **Asthenosphere** – The fluid part of the Mantle where **convection** occurs.



The Earth's outer layer is called the lithosphere. It is made of the rigid upper mantle and the crust. The lithosphere moves on the asthenosphere, part of the mantle that flows.

b) How do scientists know where the edges of these plates are?

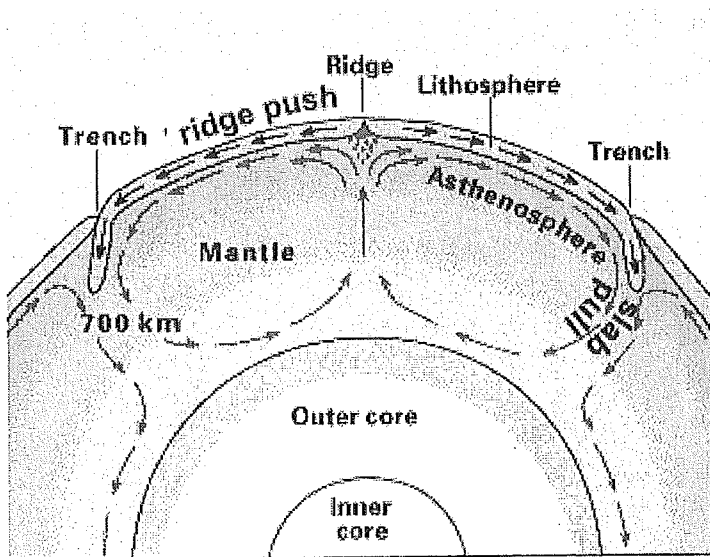
- _____ and _____ often occur along plate boundaries!



Global distribution of volcanoes (▲) and earthquakes (· · ·) based on Simkin and others (1989).

c) How do the plates move?

- The theory of Plate Tectonics states that the plates move due to _____ of heated rock in the Mantle!



Hot less-dense rock in the mantle _____, move along the surface of the earth, cool and become denser, and then _____ down into the Mantle.

This cycle pushes the lithosphere away from the ridges – “**Ridge Push.**”

The plate then sinks down with gravity – “**Slab Pull**” and melts again in the Mantle.

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