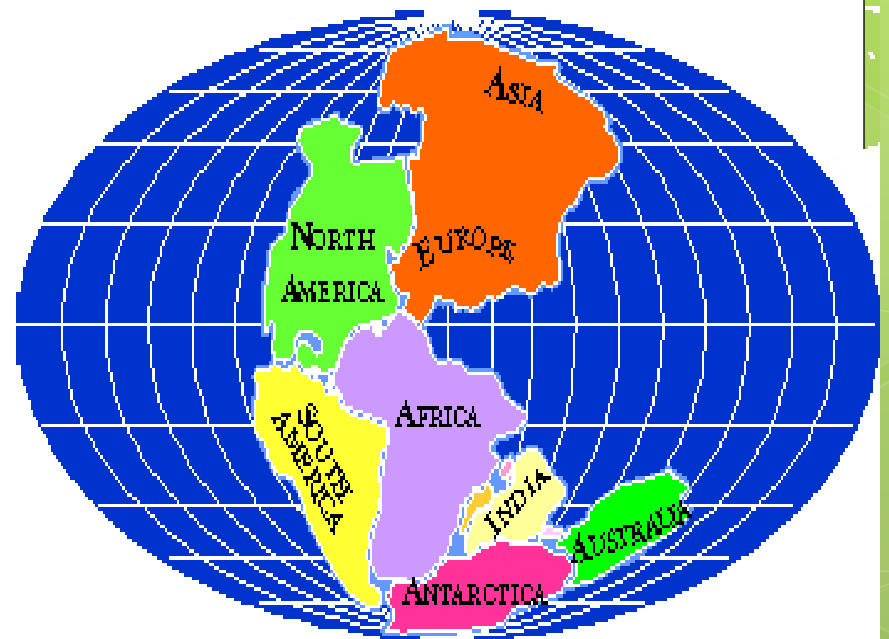


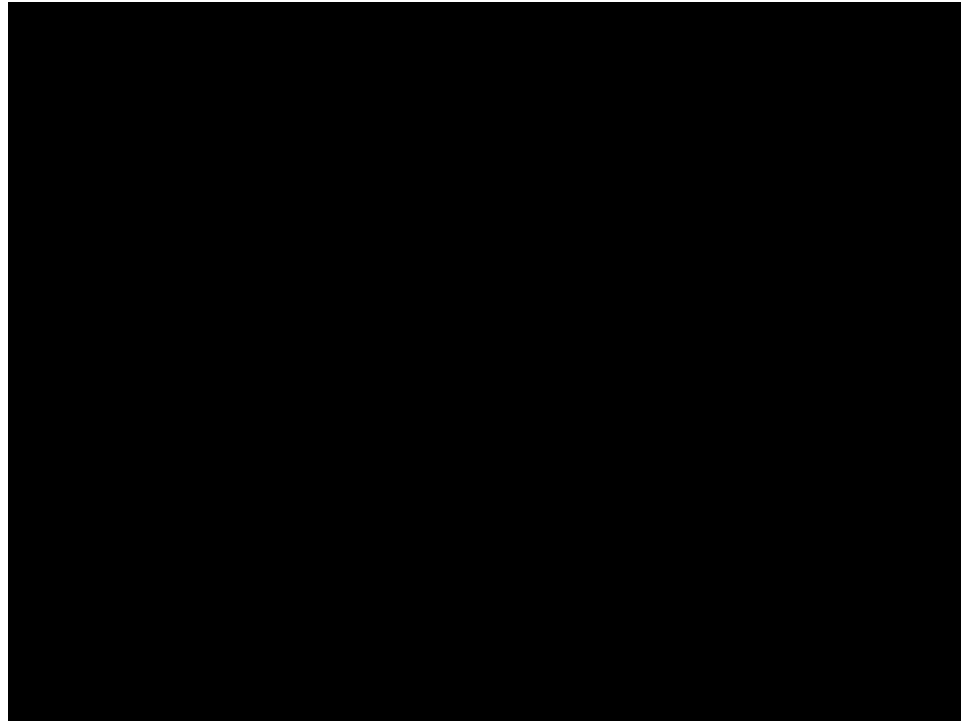
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onics

Continental Drift

- Continents were once joined together in a supercontinent called Pangaea and have since moved away from one another



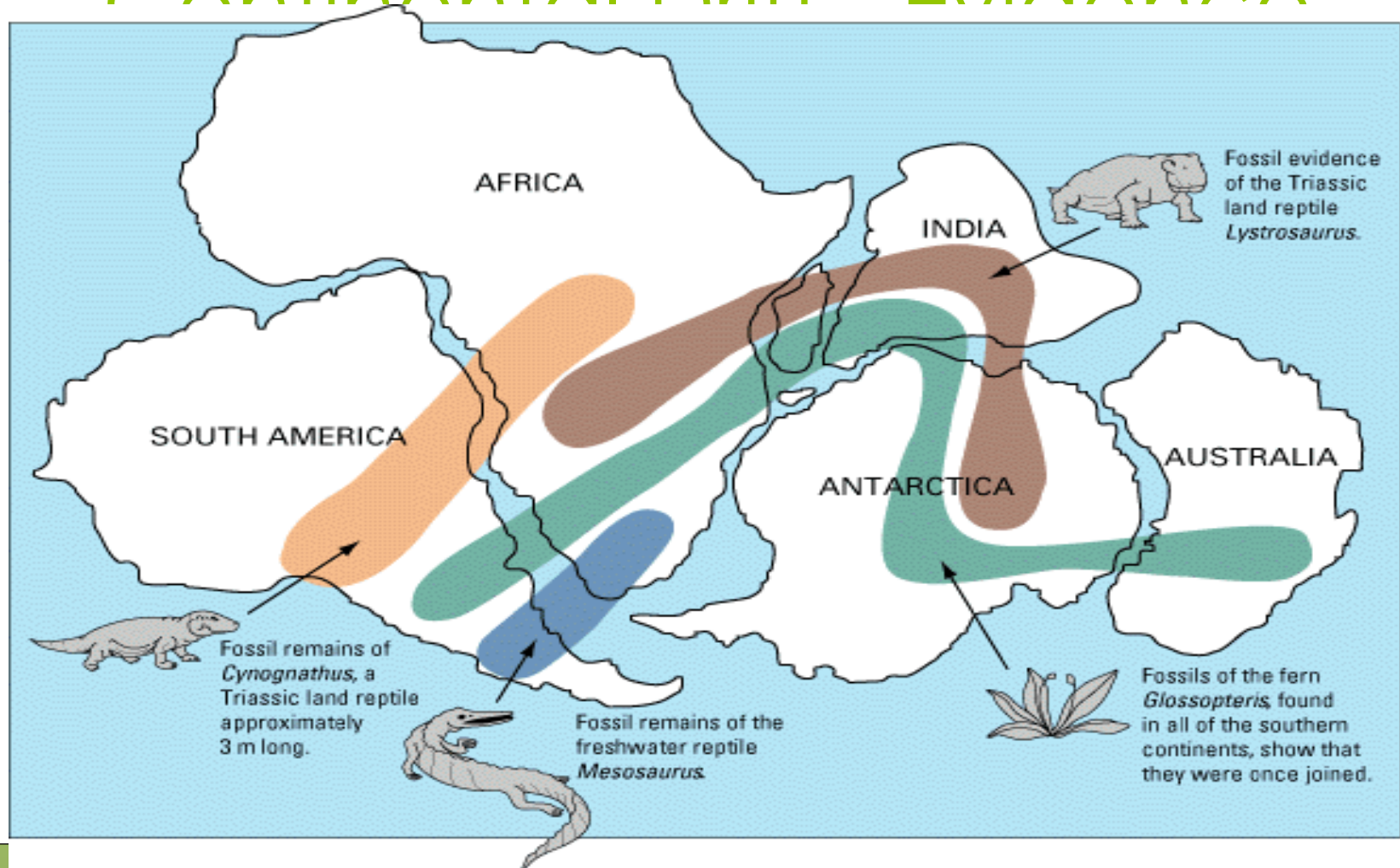
650 Million Years in under 2 minutes



Continental Drift - Evidence

1. Similarity in shape of continents
2. Presence of fossils on now widely separated continents
3. Presence of glacial deposits on continents now found near the equator
4. The similarity of rock sequences on different continents.

Continental Drift Evidence

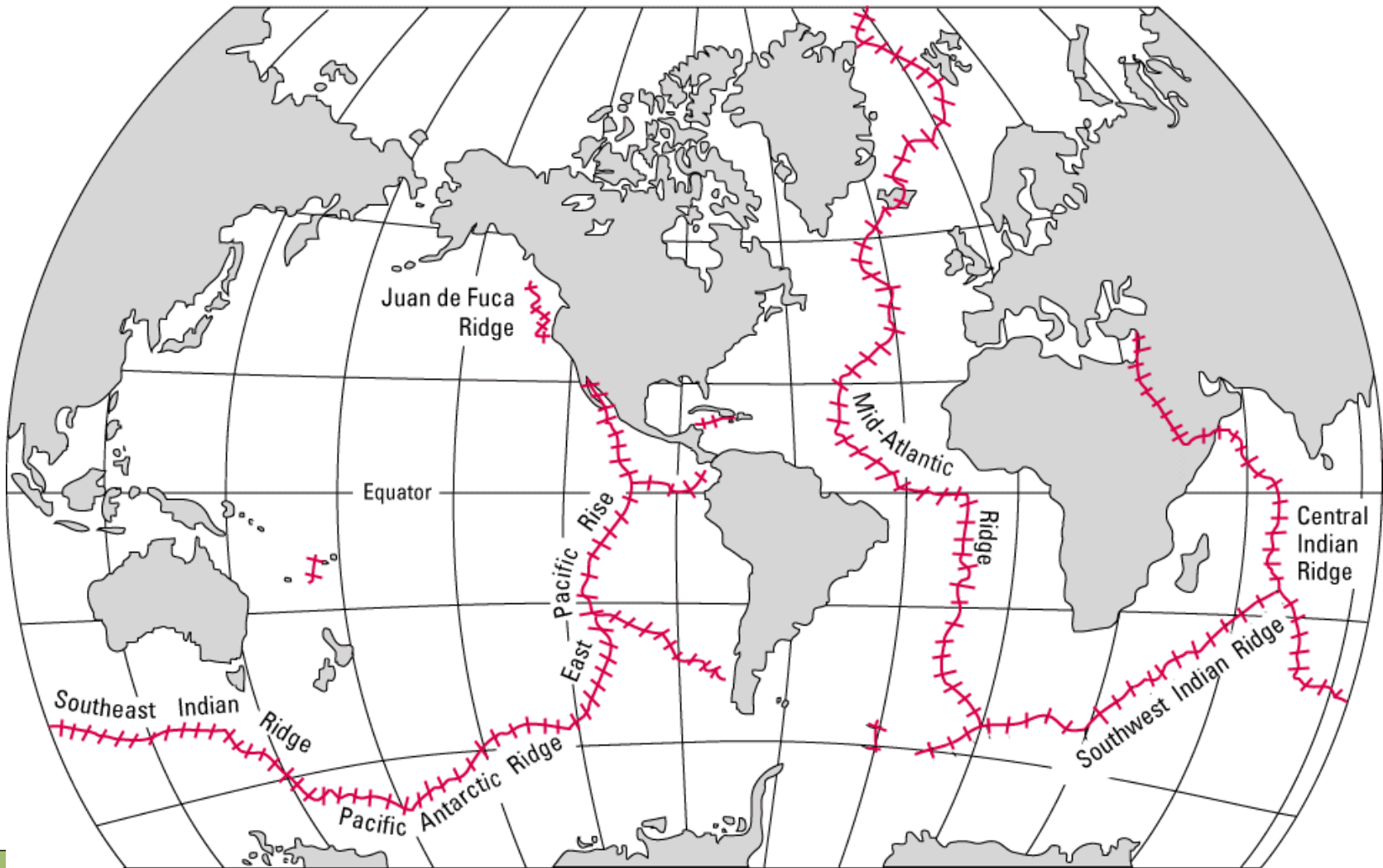
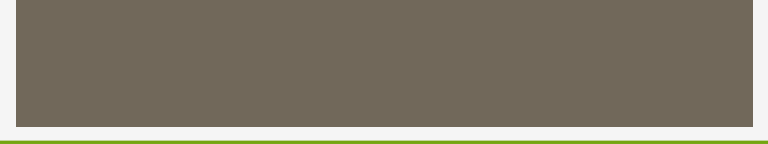


Earth's Magnetic Field

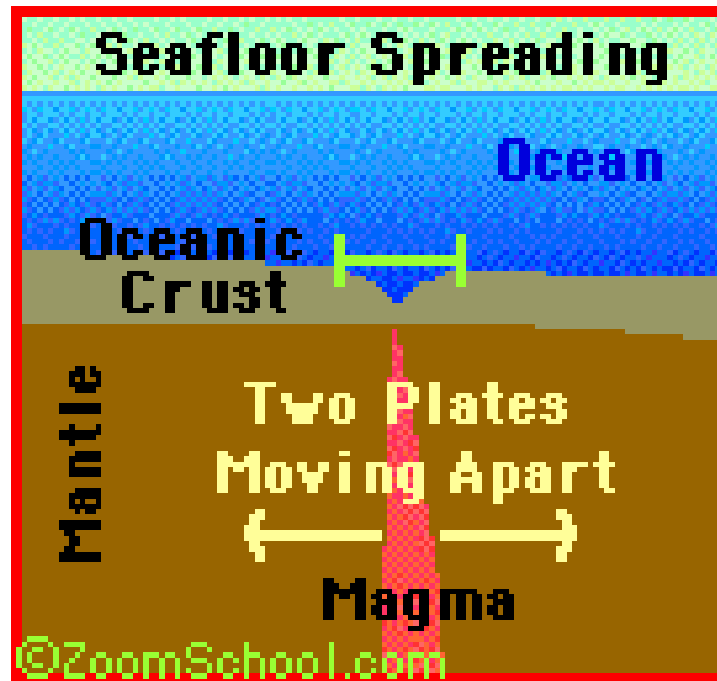
- Normal Polarity and Reversed Polarity
 - The physical Earth does not move or change its direction of rotation.
 - Alternating bands of rocks recording normal and reversed polarity are arranged symmetrically about mid-ocean ridges.

Sea-Floor Spreading

- Hypothesis: Basaltic magma from the mantle rises to create new ocean floor at mid-ocean ridges.
- Sea floor moves from the ridge towards the deep-sea trenches.
- It is then subducted and recycled back into the mantle.
- The test: Studies of Earth's magnetism



Sea-Floor Spreading



Sea-Floor Spreading

- <http://science.discovery.com/tv-shows/greatest-discoveries/videos/100-greatest-discoveries-sea-floor-spreading.htm>

Chapter 4 Section 1 Review

- What observation first led to Wegener's hypothesis of continental drift?
- The first observation that led to hypothesis of continental drift was the similarity between coastlines of continents on either side of the Atlantic

Chapter 4 Section 1 Review

- What types of evidence support Wegener's hypothesis?
- The following are types of evidence that support the continental drift hypothesis: Fossil, geological, paleomagnetic, and climatic evidence.

Chapter 4 Section 1 Review

- Describe the process of seafloor spreading.
- The oceanic crust is slowly moving away from both sides of mid-ocean ridges. The crust is replaced by magma that moves up from the rift valleys in the centers of the ridges, cools and solidifies, and then moves away from the rifts.

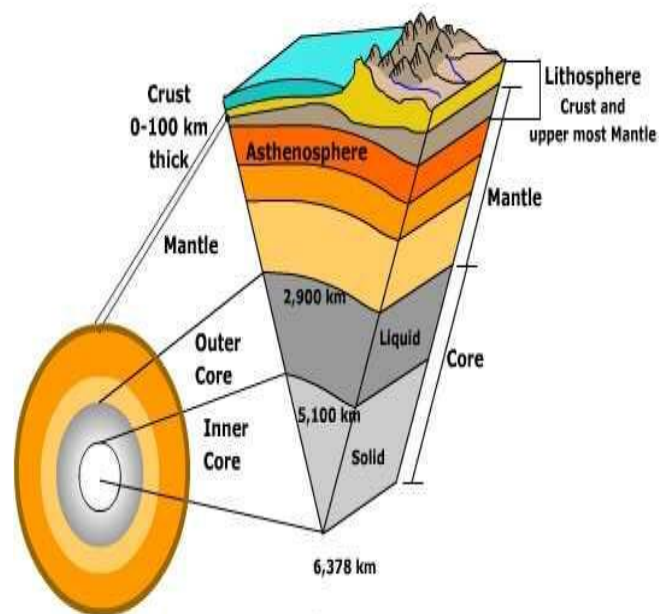
Chapter 4 Section 1 Review

- Explain how scientists know that the earth's magnetic poles have reversed themselves many times during earth's history.
- They have observed normal and reversed magnetic polarity in rocks on land and on the ocean floor. Dating the rocks verifies that they fall into alternating periods of normal and reversed polarity.

The Earth's Layers

- Crust, mantle and core
- Lithosphere
 - Outer 100 km
 - Rigid layer
 - Crust & uppermost mantle
 - Broken into a small # of plates that move over the **asthenosphere**.

The Earth's Layers

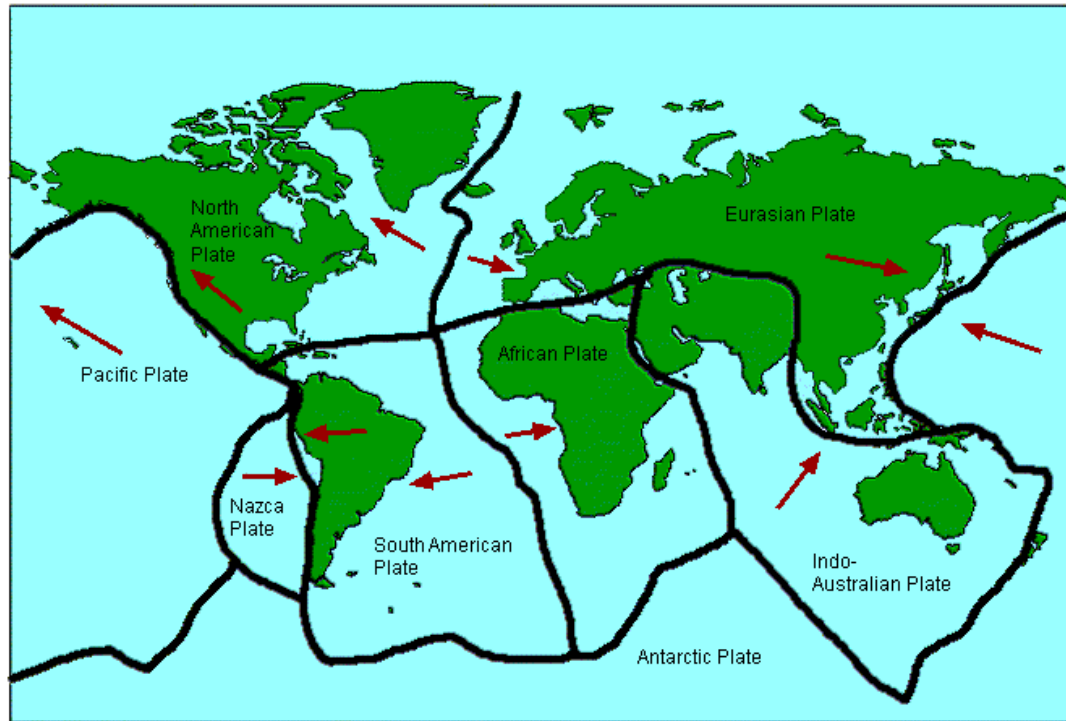


Earth Structure
(Not to Scale)

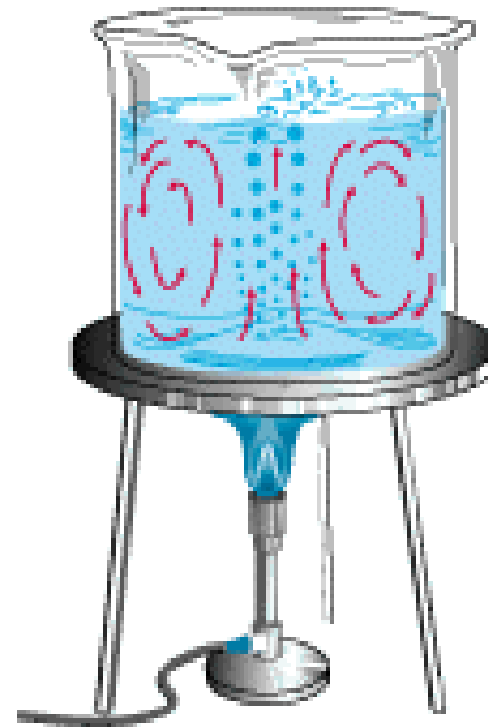
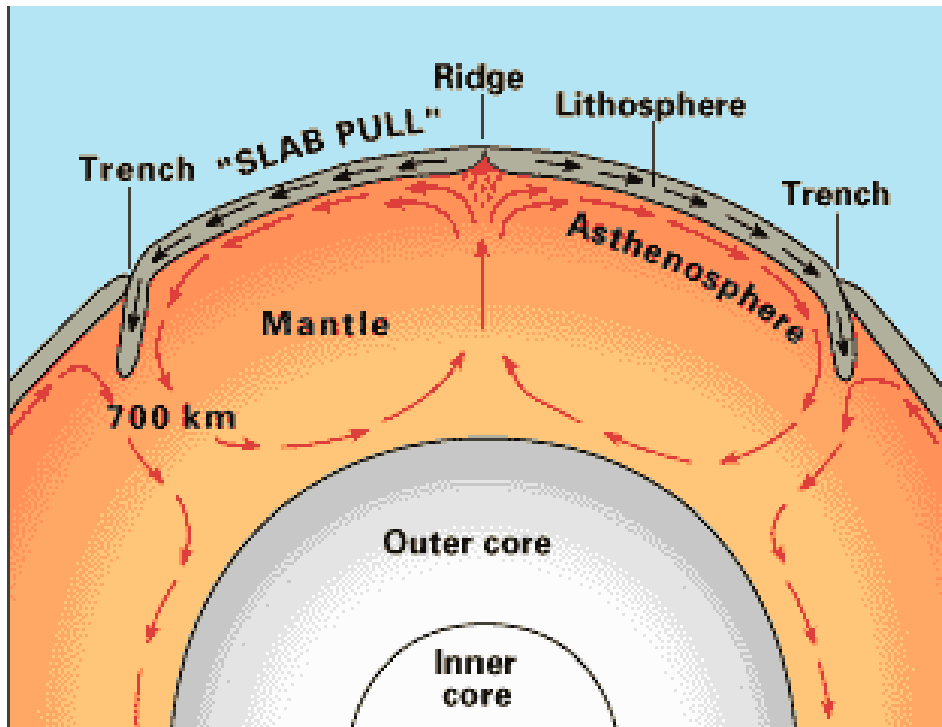
The Earth's Layers

- Asthenosphere
 - A plastic layer in the upper mantle
- Plate movement is caused by
 - Convection Currents in the mantle
- Plates are moving at an average of a few cm/year.

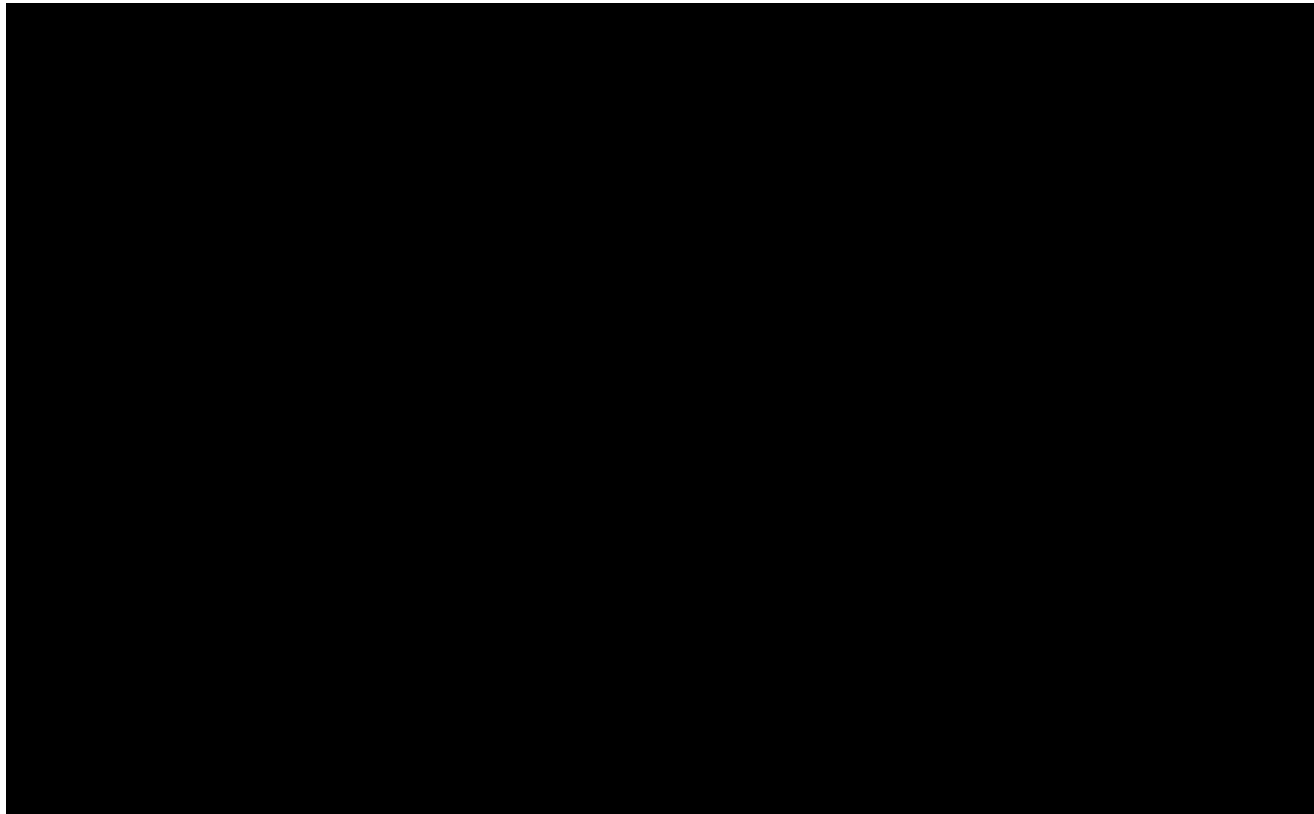
The Earth's Plates



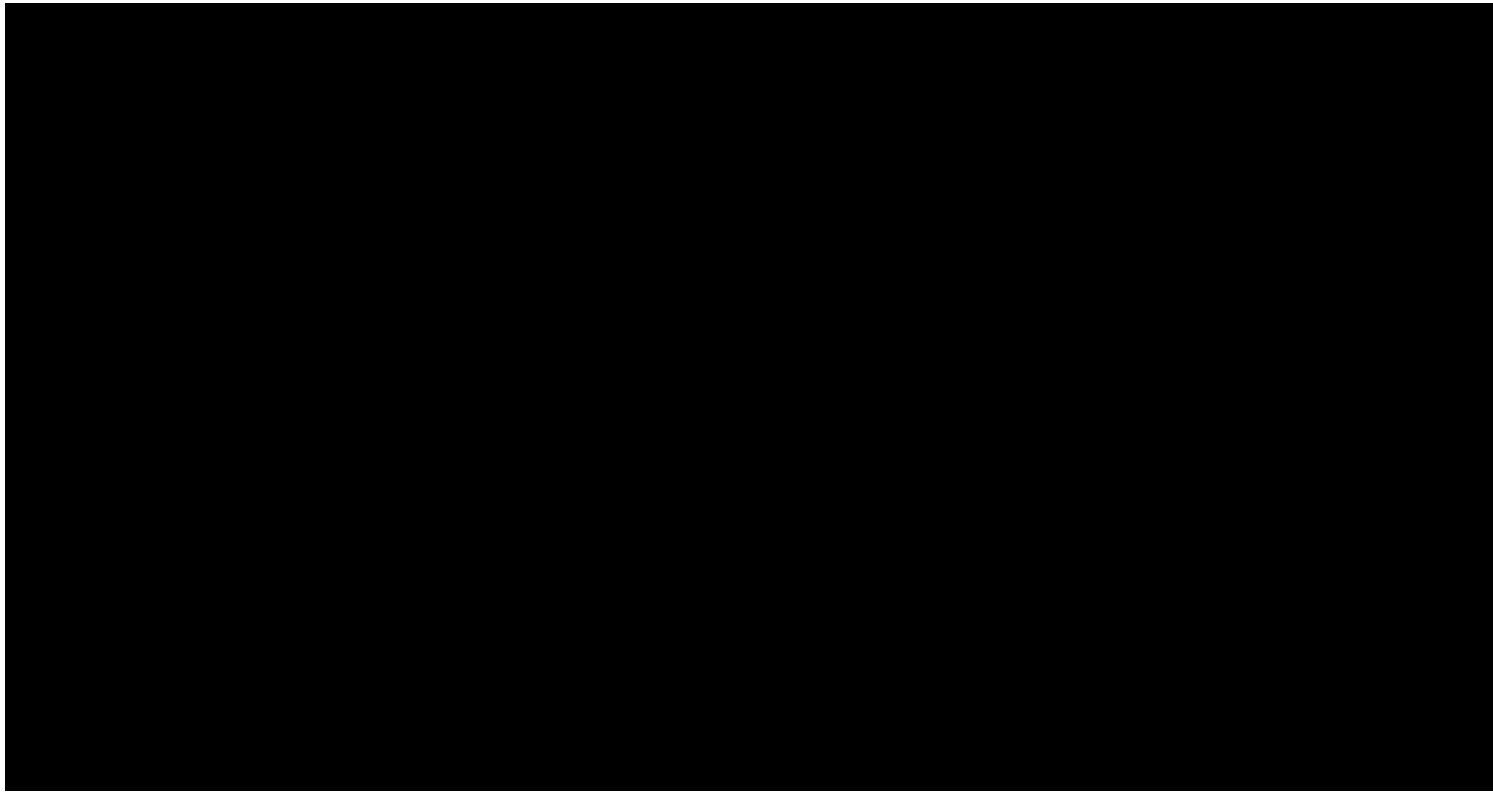
Convection Currents



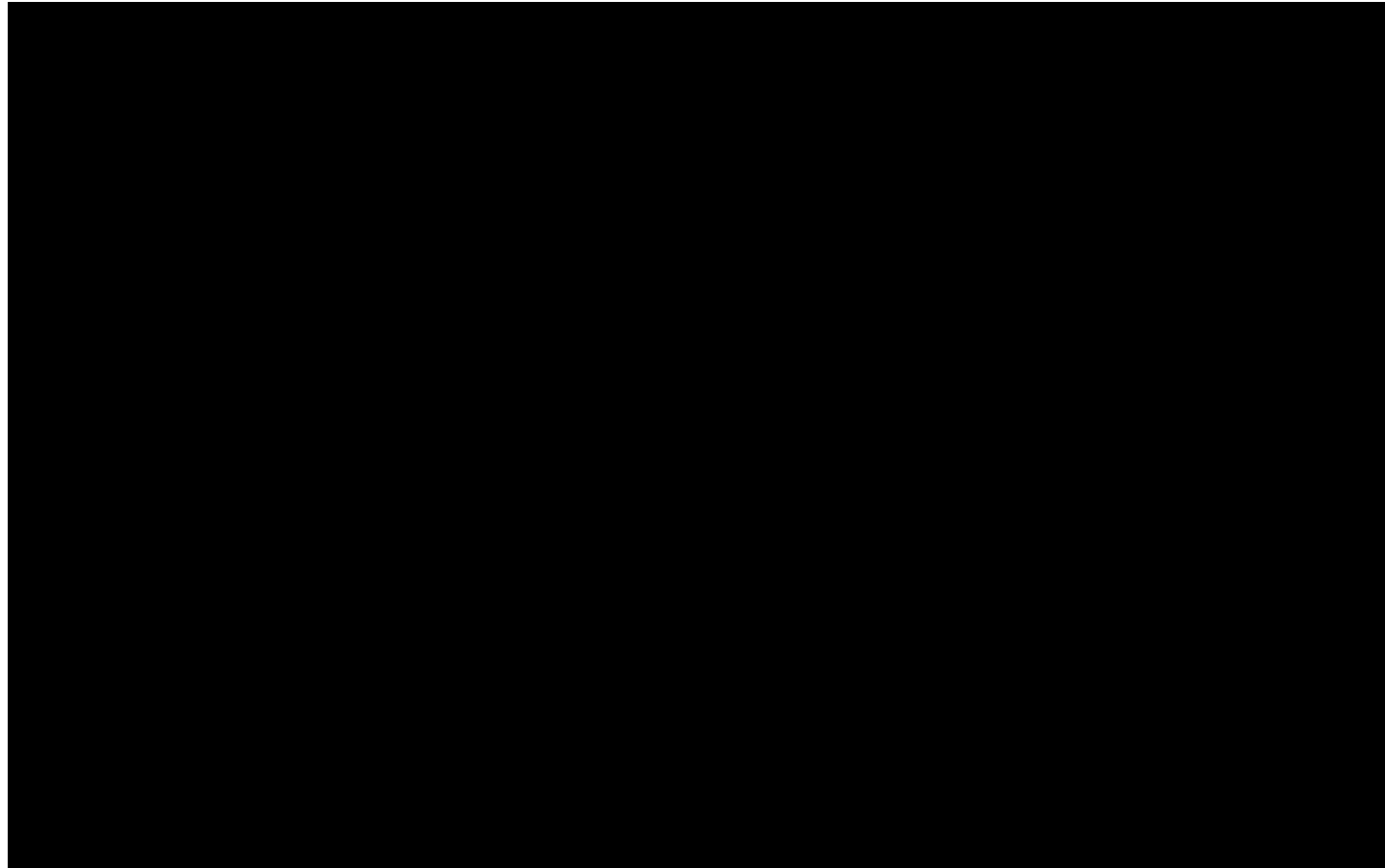
Convection Currents



How Plates Move: *Convection Currents*



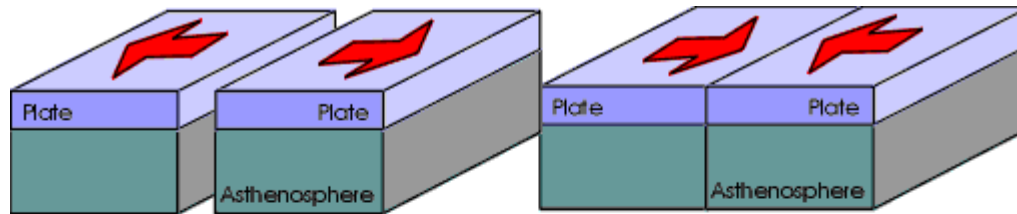
How Plates Move: *Convection Currents*



Types of Plate Boundaries

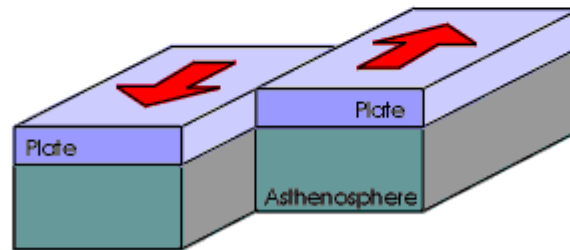
- Convergent Boundary
 - Plates collide or come together.
- Divergent Boundary
 - 2 plates move apart.
 - New crust is formed.
- Transform Boundary
 - Plates slide past one another.

Types of Boundaries



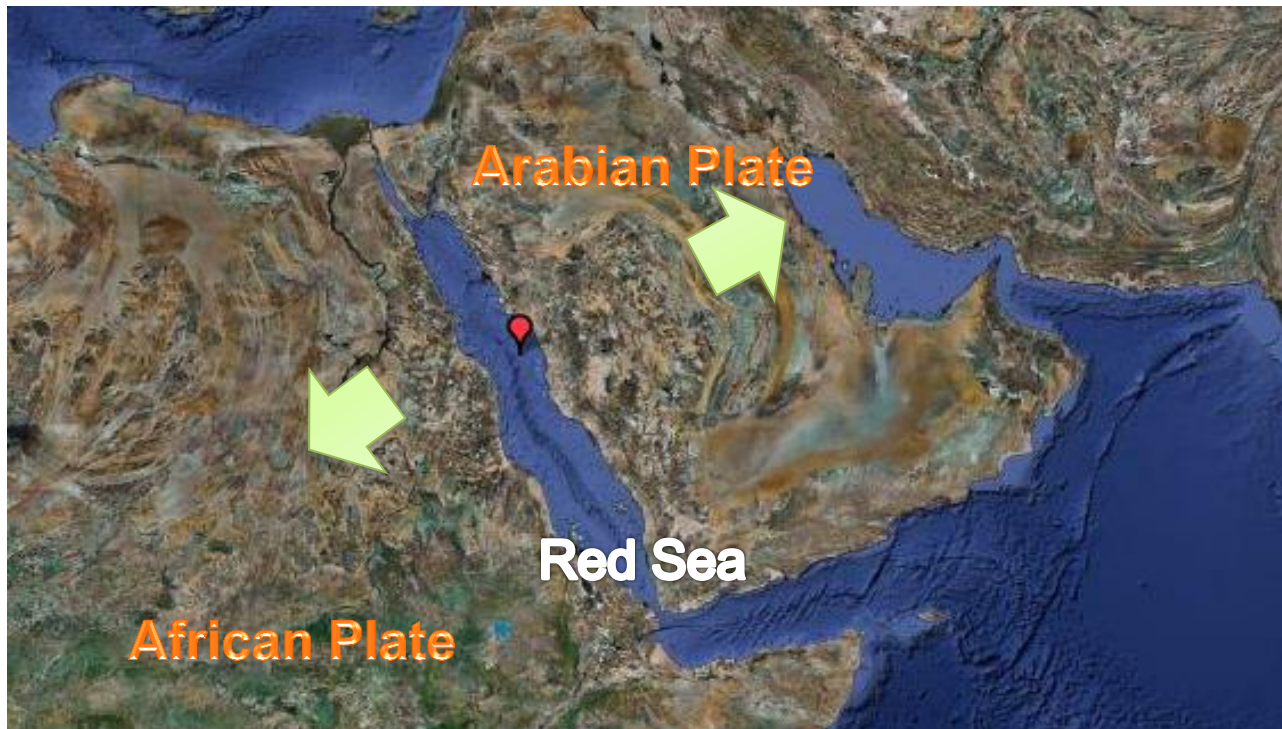
Divergent

Convergent

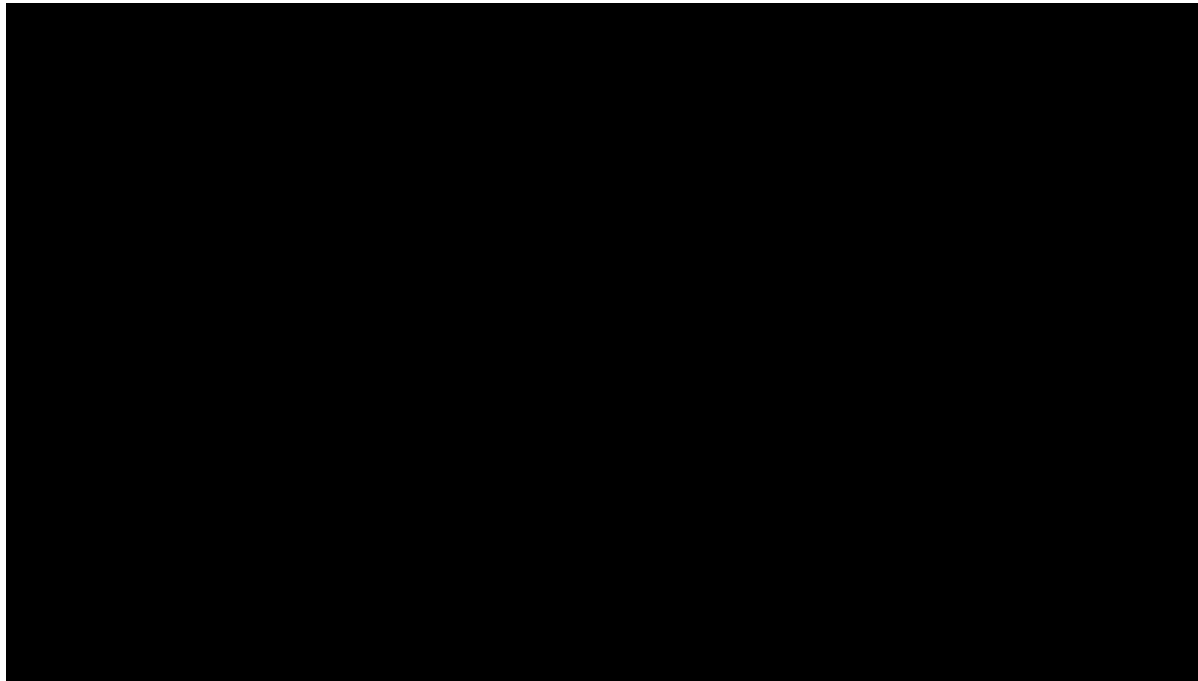


Transform

Divergent Boundary Arabian & African Plates

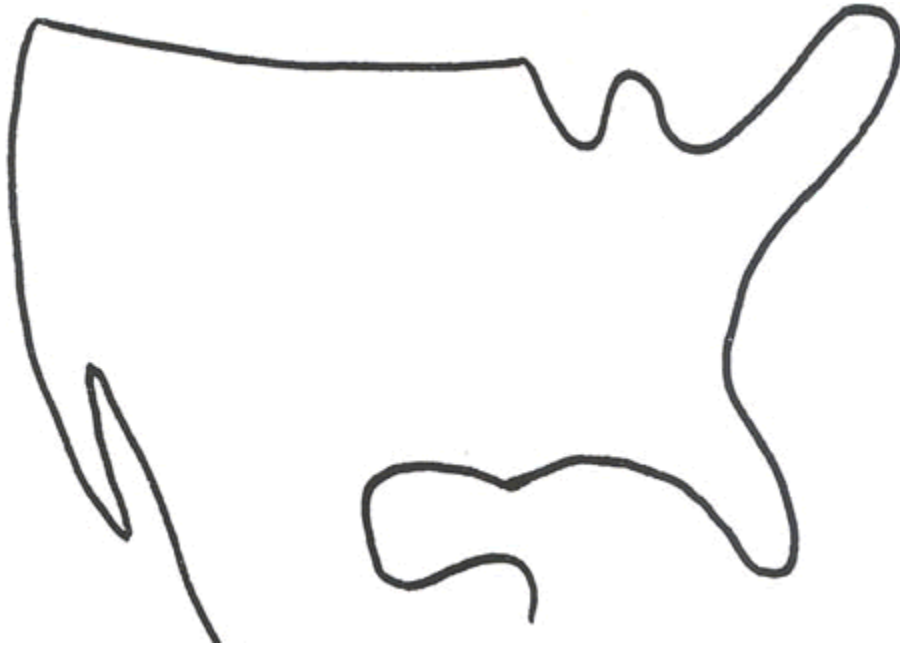


Divergent Boundary

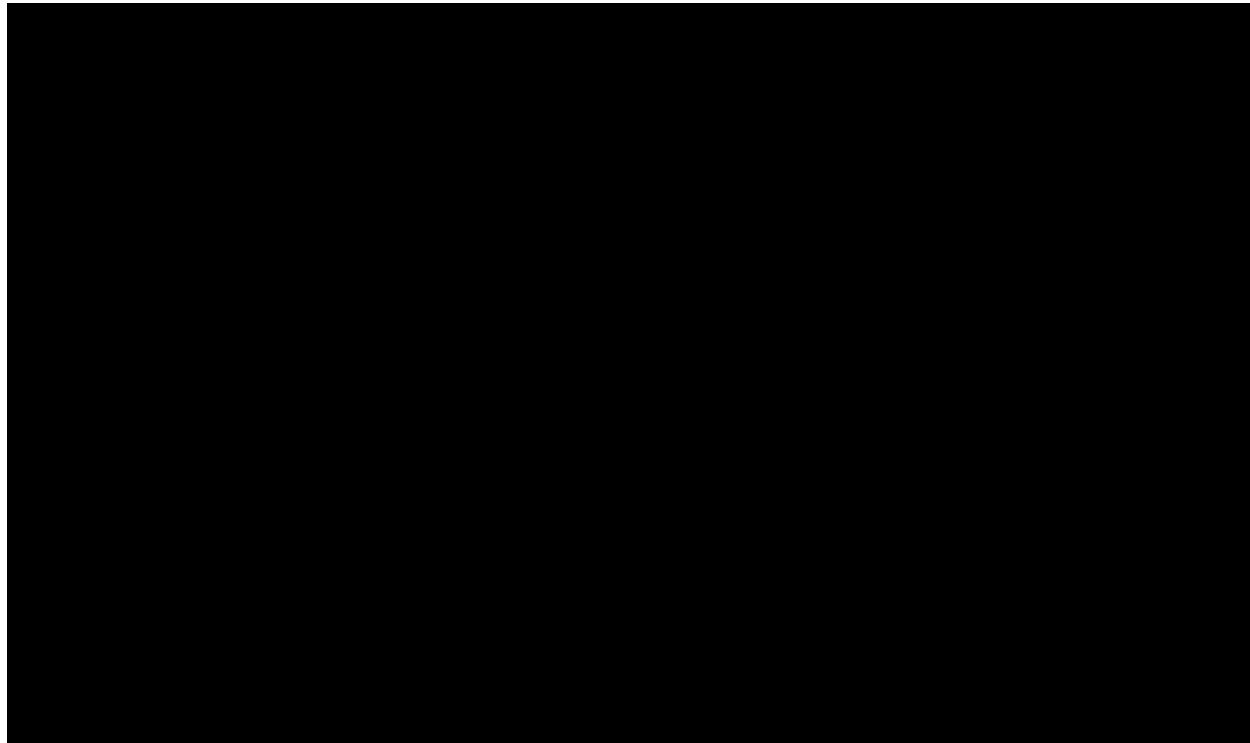


Transform Boundary

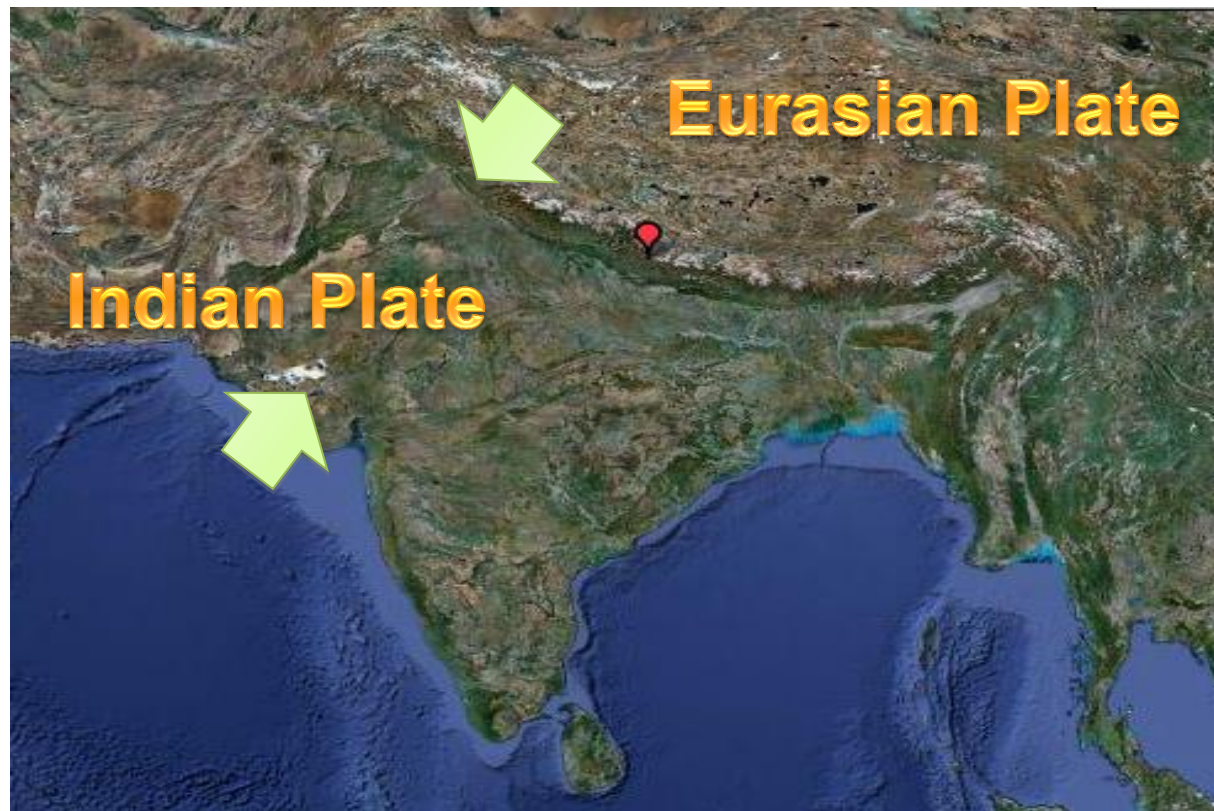
San Andreas Fault



Transform Boundary



Convergent Boundary Indian & Eurasian Plates



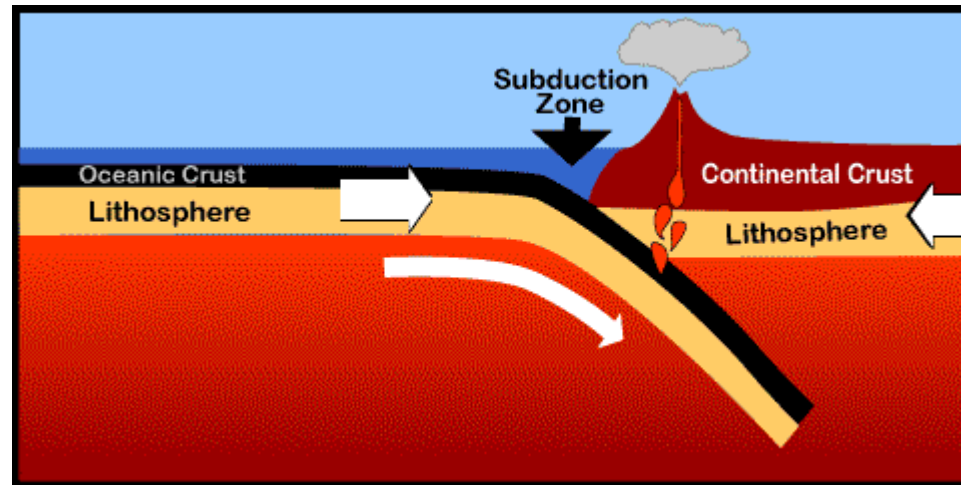
The Ocean Floor

- Variety of topographic features:
 - Flat plains, long mountain chains, and deep trenches
- Mid-ocean Ridge
 - Longest mountain chain on Earth
 - Divergent Boundaries
 - Upwelling of magma from mantle creates new ocean floor

The Ocean Floor

- Deep-sea trenches
 - Long, narrow basins
 - Develop adjacent to subduction zones.
- Subduction Zones
 - Areas where oceanic crust slides back into the mantle.

Subduction Zones



Chapter 4 Section 2 Review

- Summarize the theory of plate tectonics.
- Plate tectonics proposes that the earth's crust consists of about 30 plates with both oceanic and continental crust that ride on the asthenosphere and are moved by convection currents.

Chapter 4 Section 2 Review

- Name and describe the three major types of plate boundaries.
- Two plates moving apart form a divergent boundary. The direct collision of two plates forms a convergent boundary. A transform boundary forms where plates slide past each other.

Chapter 4 Section 2 Review

- Describe the 3 types of plate collisions that occur along convergent boundaries.
- A collision between a continental crust plate and a oceanic crust plate
- A collision between 2 plates with continental crust
- A collision between 2 plates with oceanic crust

Chapter 4 Section 2 Review

- How might convection currents cause plate movement?
- Convection currents cause plate movement when the cold, dense lithosphere sinks which pulls the plates. Where the plates pull apart, hot asthenosphere rises.