

EEn.2.1.1

I can explain how the rock cycle, plate tectonics, volcanoes, and earthquakes impact the lithosphere.

What is a Rock?

- Any solid mass of mineral or mineral-like matter that occurs naturally as part of our planet
- 3 types
 - Igneous
 - Sedimentary
 - Metamorphic



G657



G663



G664



Zidingxiang



Taohuahong



G682



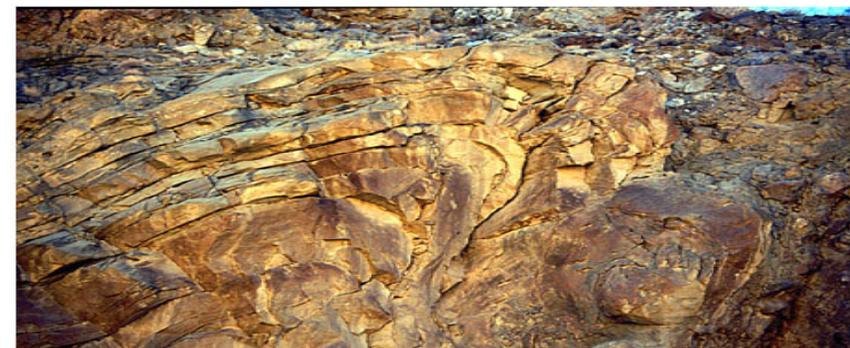
G684 basalt



G696



shanxi black B



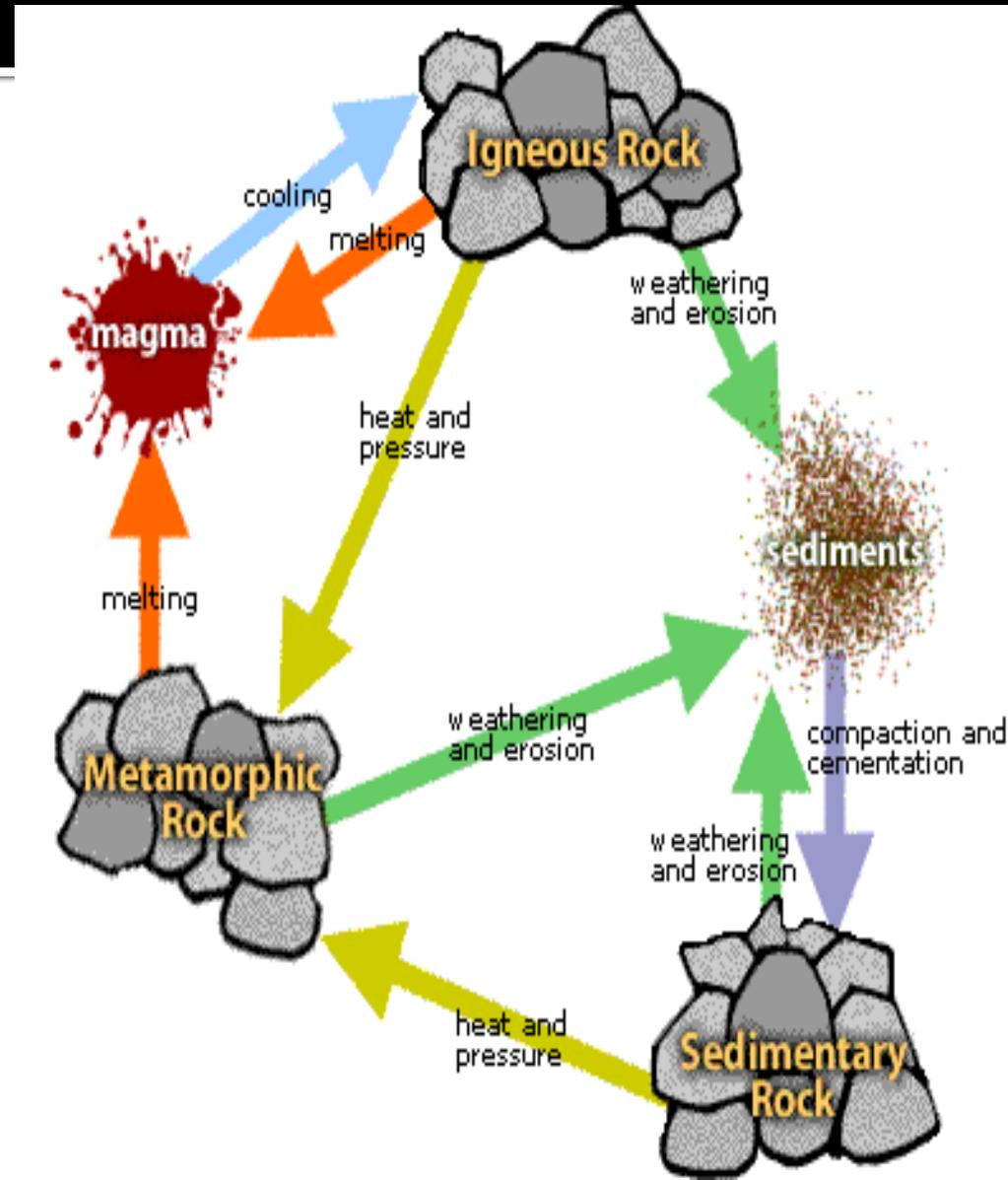
The Grand Canyon



The Rock Cycle

- Interactions among Earth's water, air, land, and living things can cause rocks to change from one type to another
- A continuous process
- Driven by heat and mechanical energy

[ROCK CYCLE VIDEO](#)



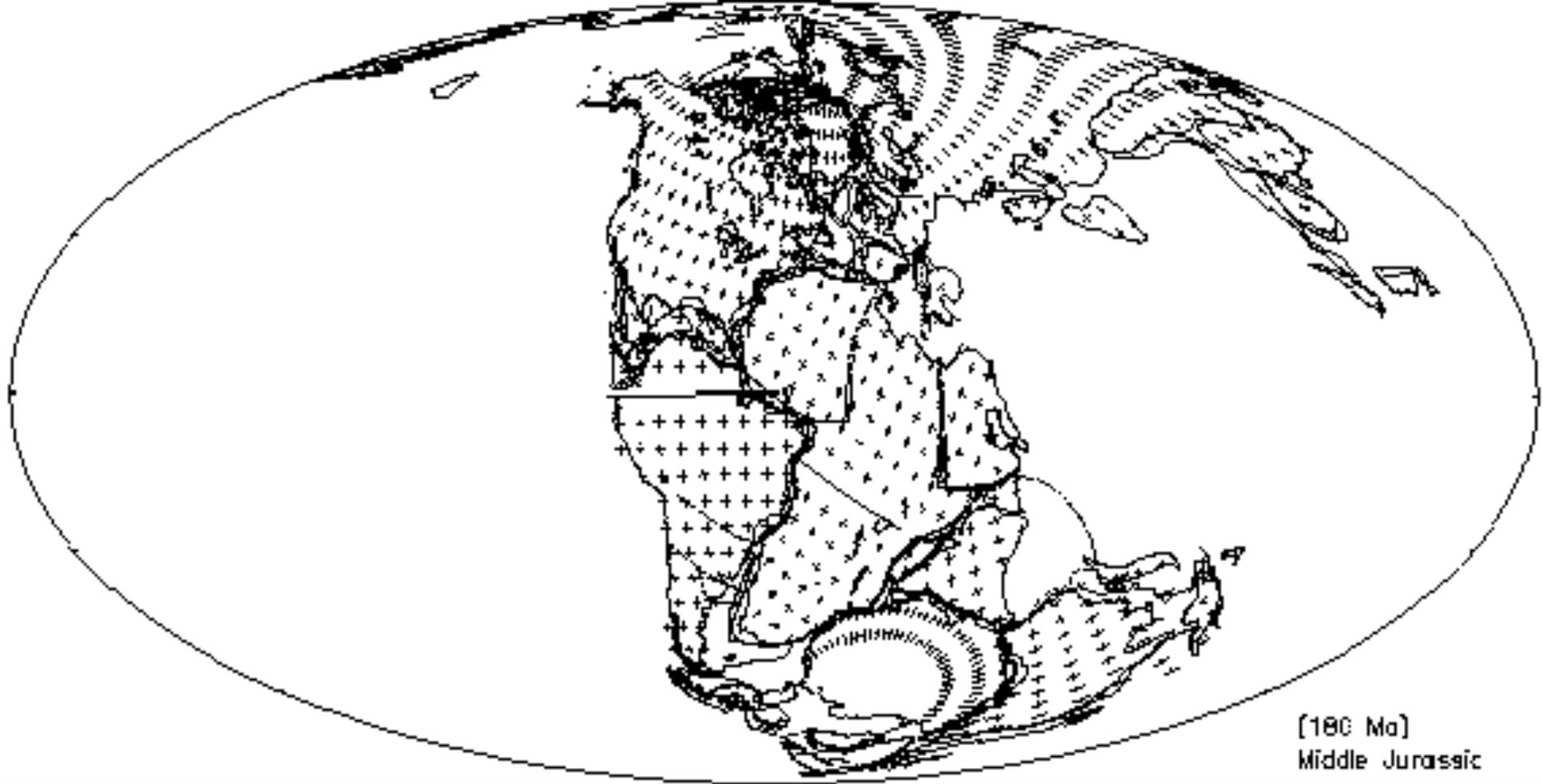
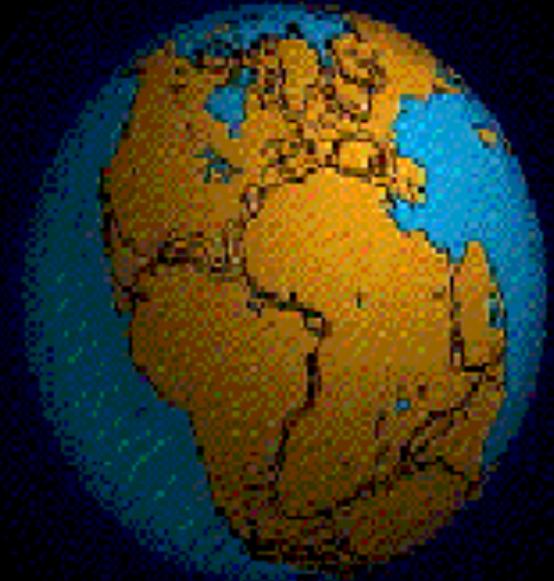
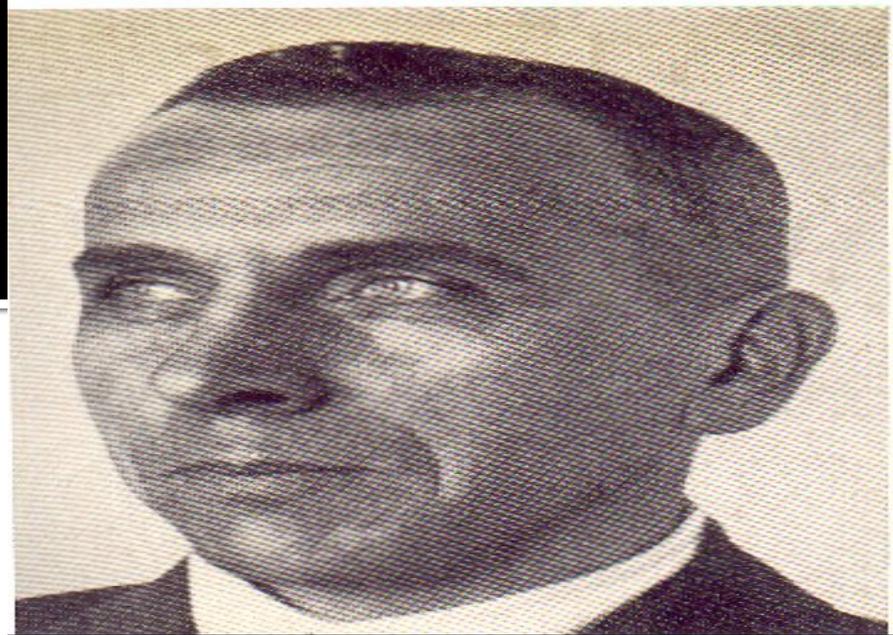


Plate Tectonics

What is Continental Drift

- Proposed by Alfred Wegener
- Stated that the continents had once been joined to form a single supercontinent
- Wegener's Theory
 - Pangaea broke apart 200 MY
 - Continents "drifted"
 - Continents "broke" through the oceans

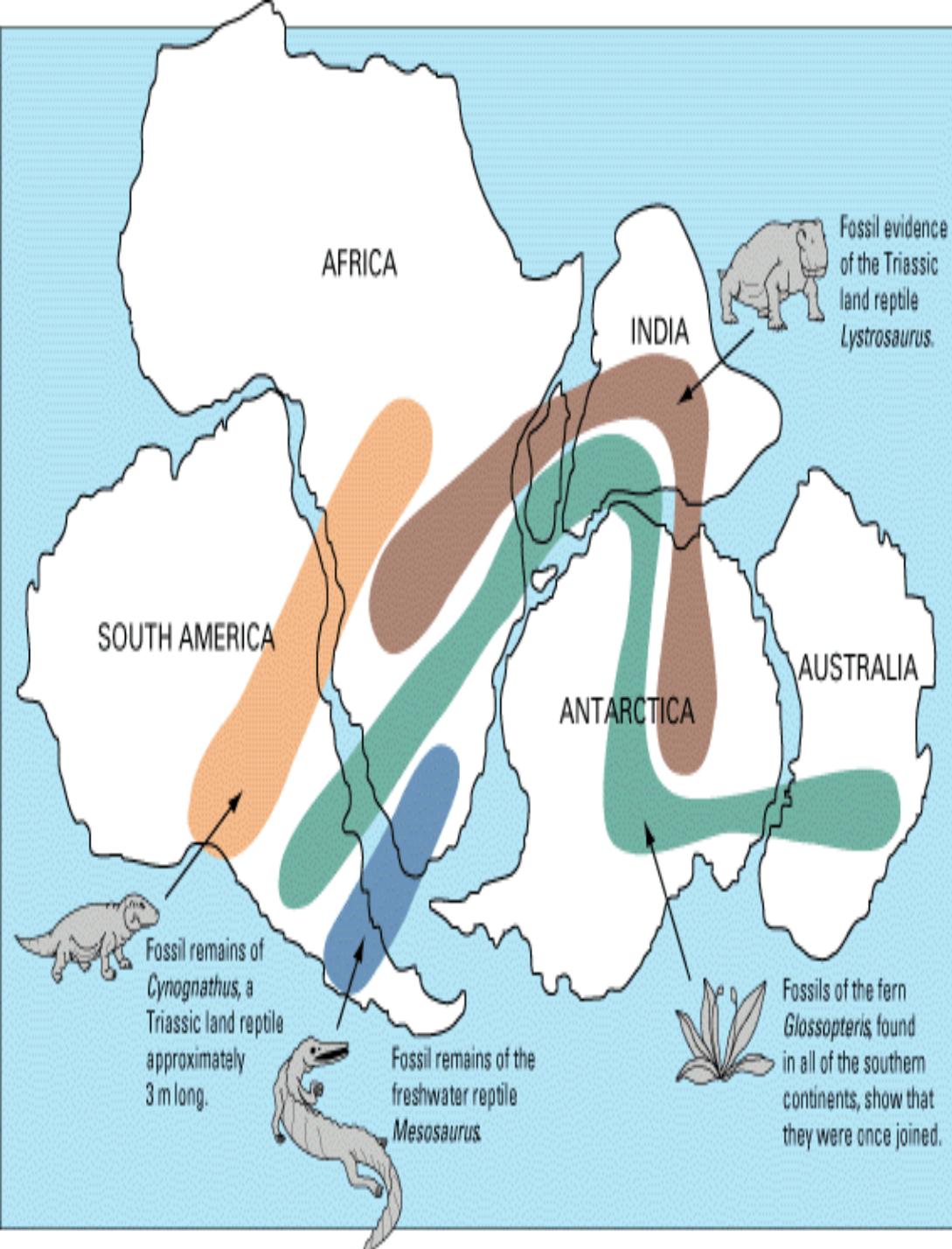


Pangaea

- Occurred 500 MY
- Continents breakup begins 200 MY
- North America and Africa split 135 MY



Evidence of Continental Drift

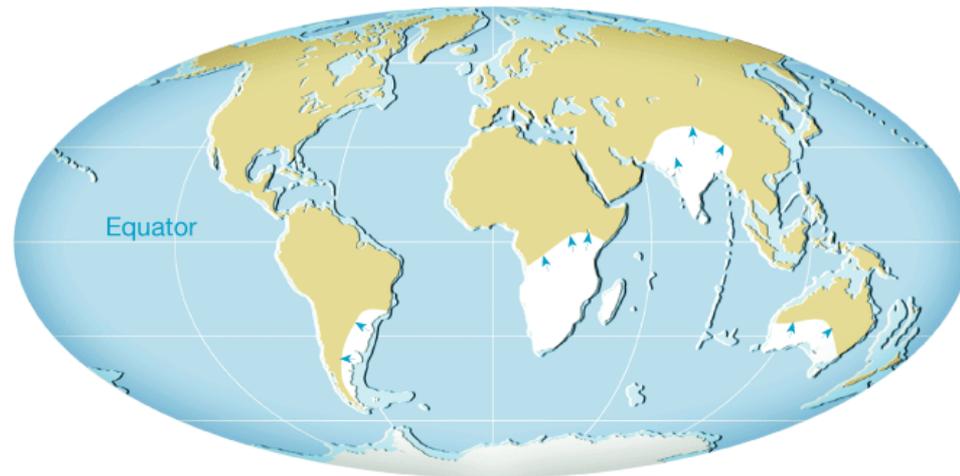


- Shorelines look like they fit together
- Fossil organisms found on different landmasses
- Several mountain belts end at one coastline, only to reappear on a landmass across the ocean
- Ancient Climates

Matching Mountain Ranges

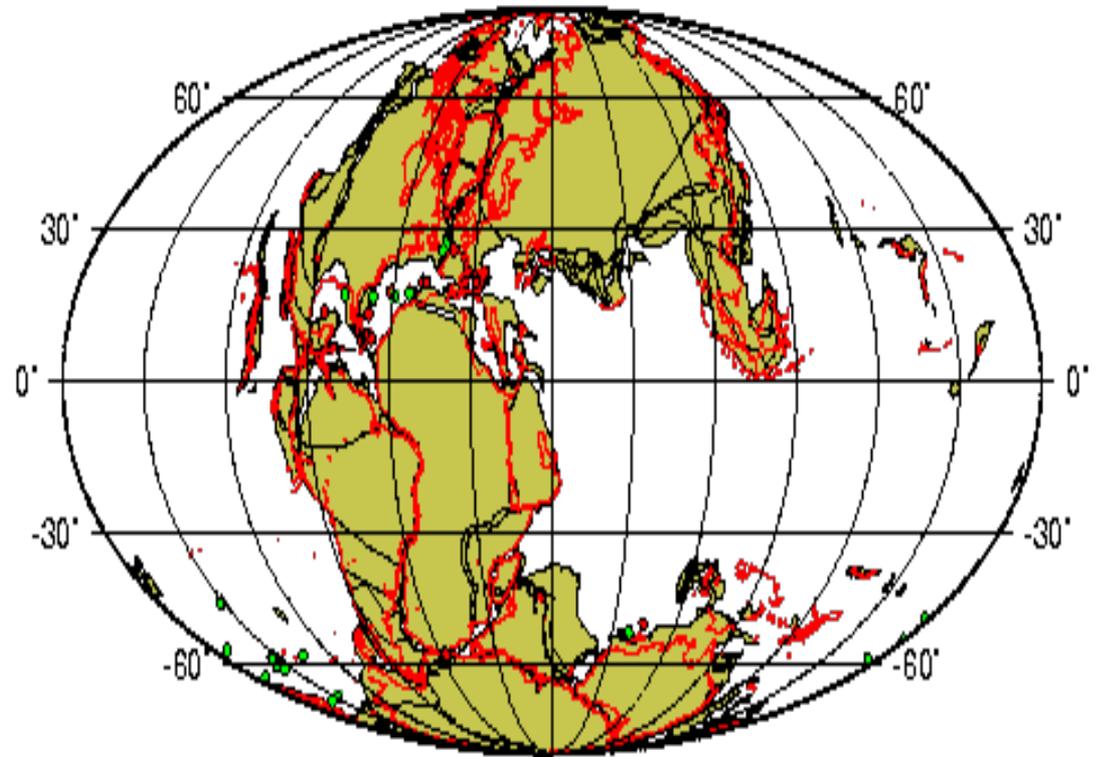


Glacier Evidence

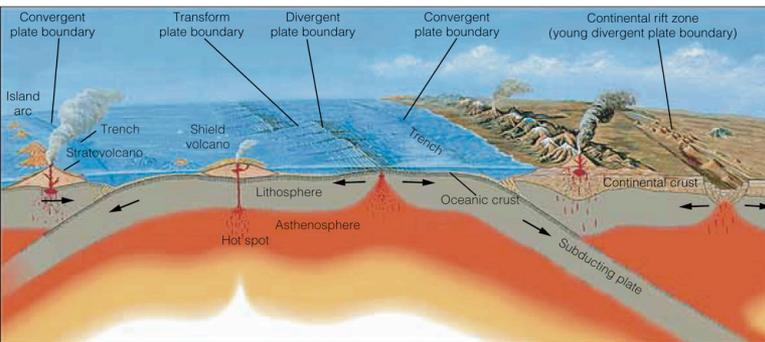
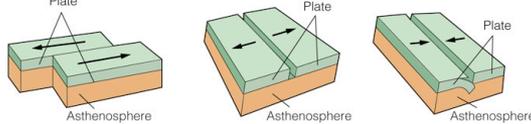


The Theory of Plate Tectonics

- Proposes that Earth's outer shell consist of individual plates that interact in various ways and thereby produce earthquakes, volcanoes, mountains, and the crust itself



150 My Reconstruction



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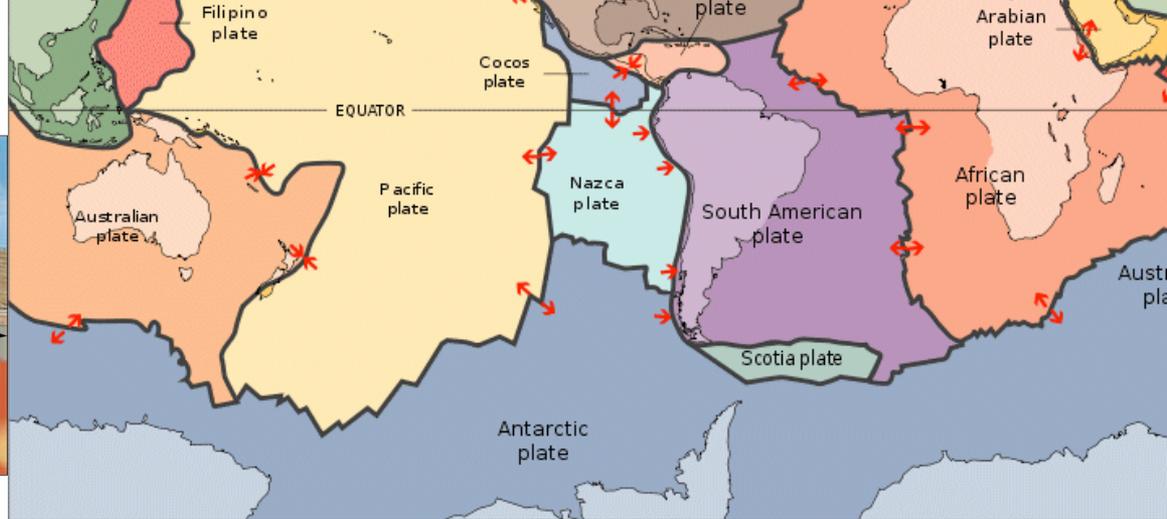
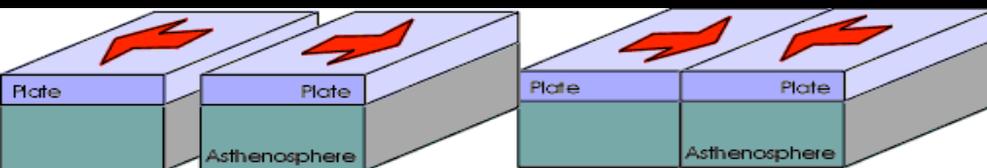
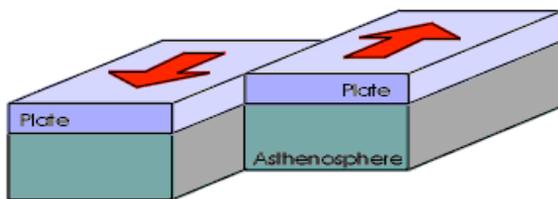


Plate Boundaries and Features

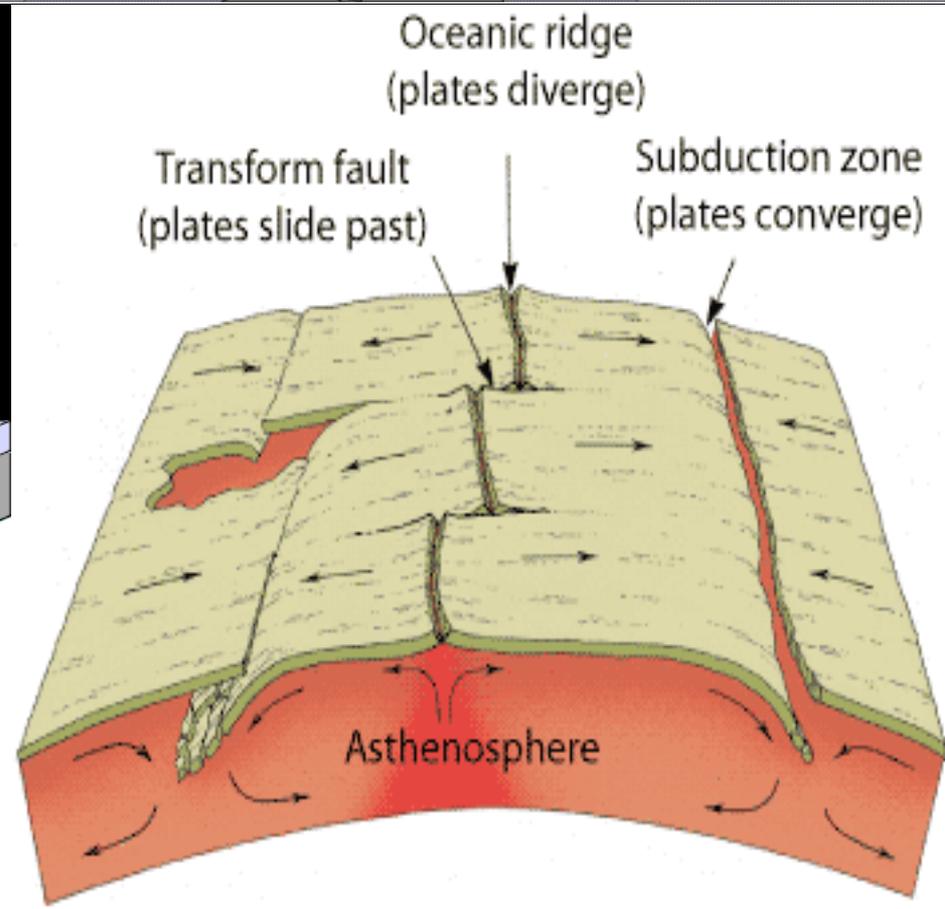


Divergent

Convergent

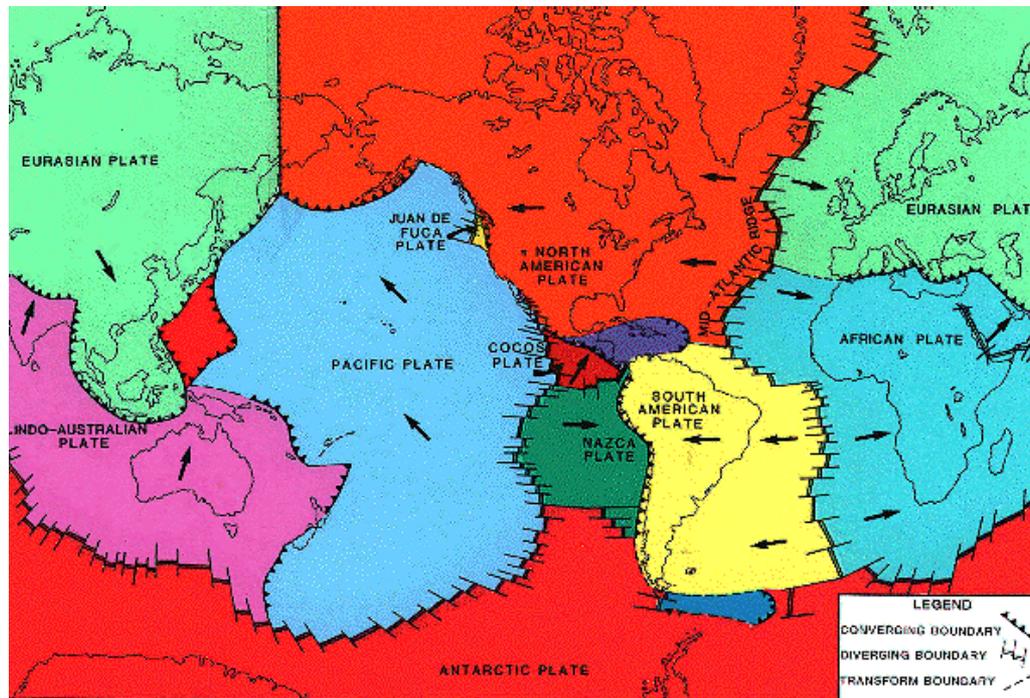


Transform



Do the plates move?

□ *Do the plates move? If so, why?*



Causes of Plate Motion

- Mantle Convection
 - Basic driving force for plate movement
 - The unequal distribution of heat within Earth causes thermal convection the drives plate motion

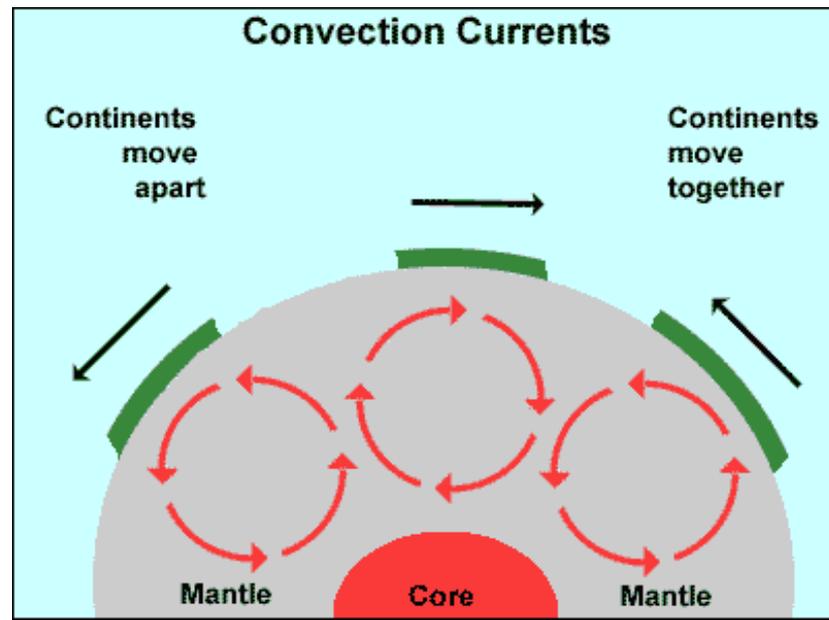
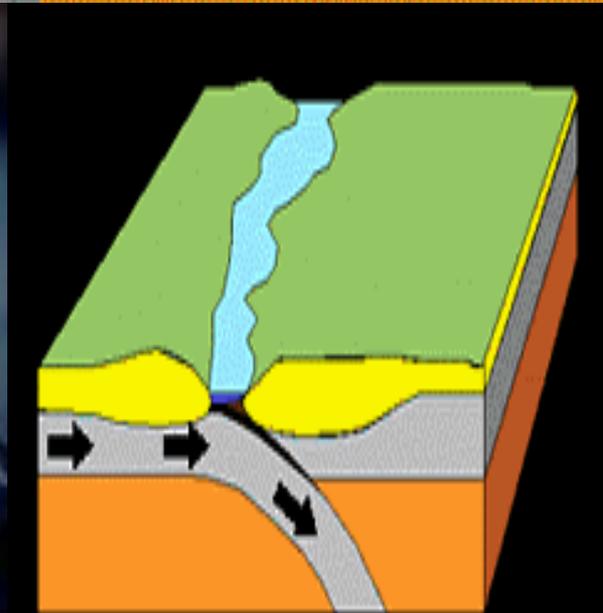
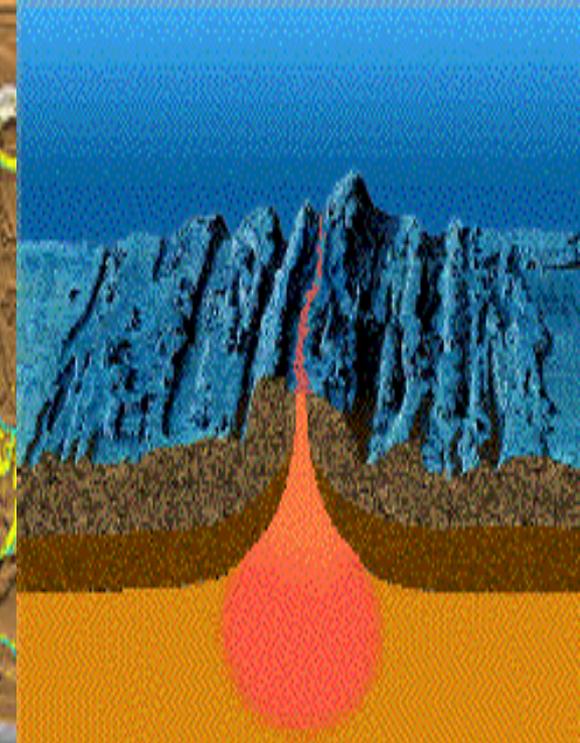
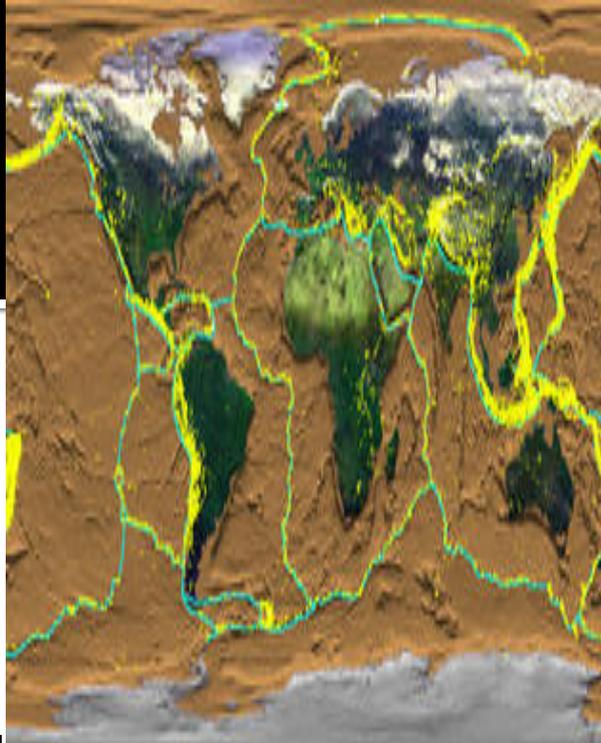


Plate Boundary Activities

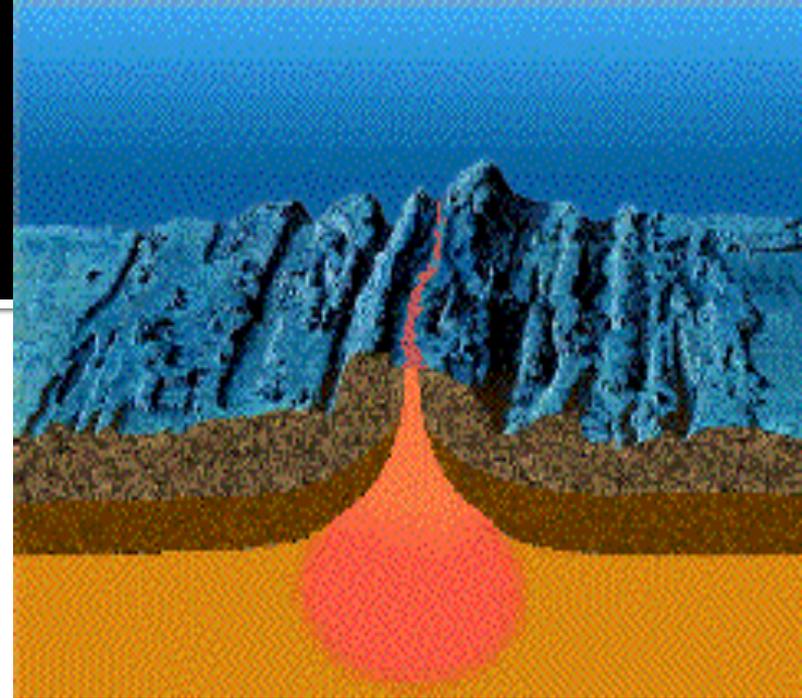
- Seismic activity – Earthquakes!
- Volcanism
- Mountain Building
- Sea Floor Spreading



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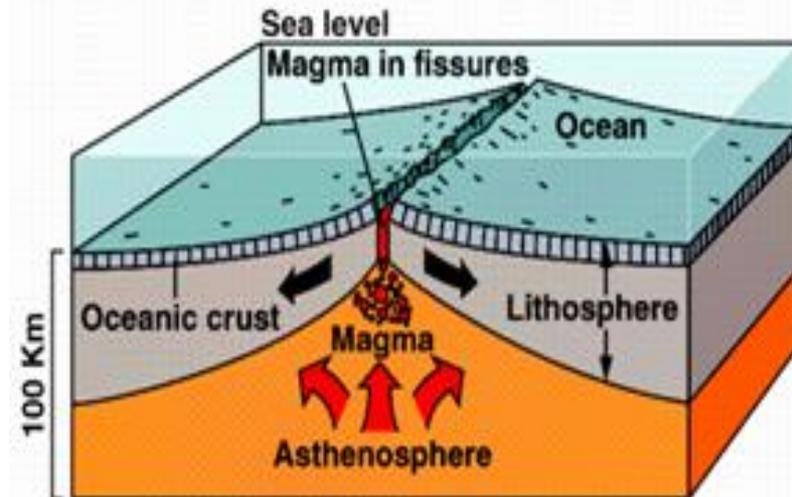
Divergent Boundaries

- Also called spreading centers
- When two plates move apart
- Creates new seafloor (seafloor spreading)
- Causes ocean ridges and rift valleys



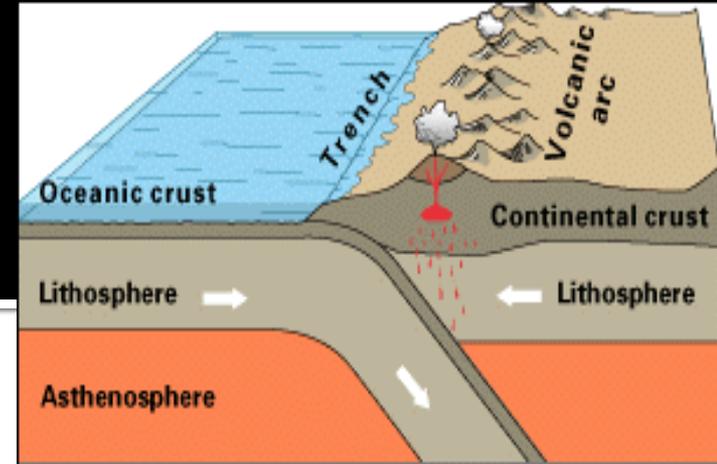
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A Divergent Boundary

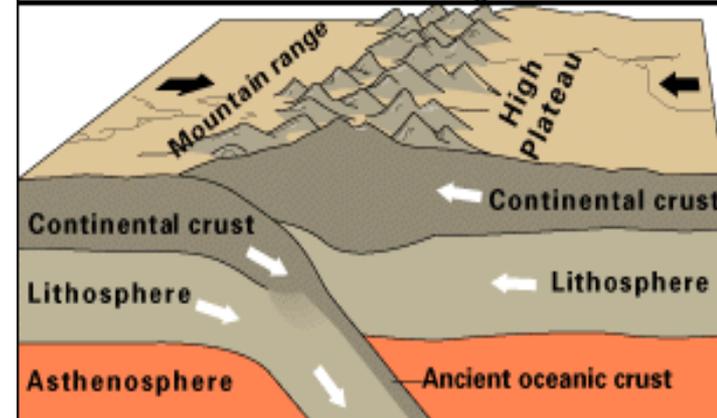


Convergent Boundaries

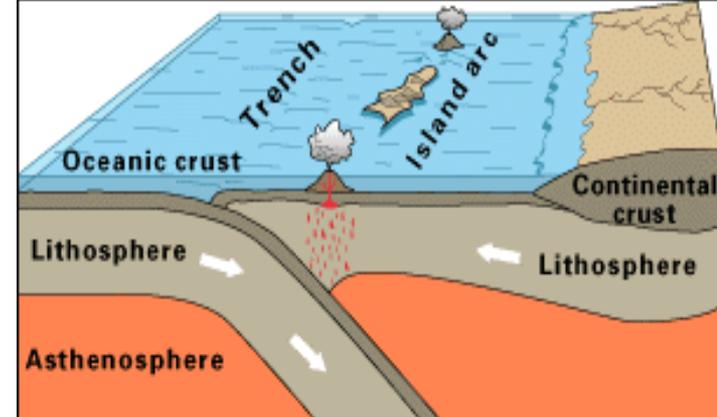
- Where two plates move together
 - **Oceanic-Continental boundaries**
 - Oceanic plate goes beneath the continental plate
 - Causes subduction zones, trenches, continental volcanic arcs
 - **Continental-Continental Boundaries**
 - Two plates collide
 - Forms mountains
 - **Oceanic-Oceanic boundaries**
 - One oceanic plate goes beneath another oceanic plate
 - Creates volcanic island arcs



Oceanic-continental convergence



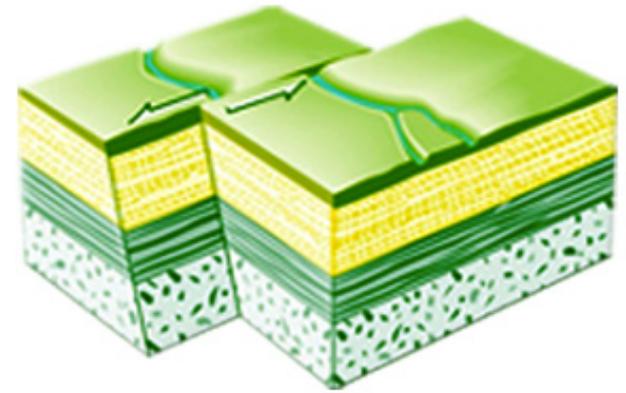
Continental-continental convergence



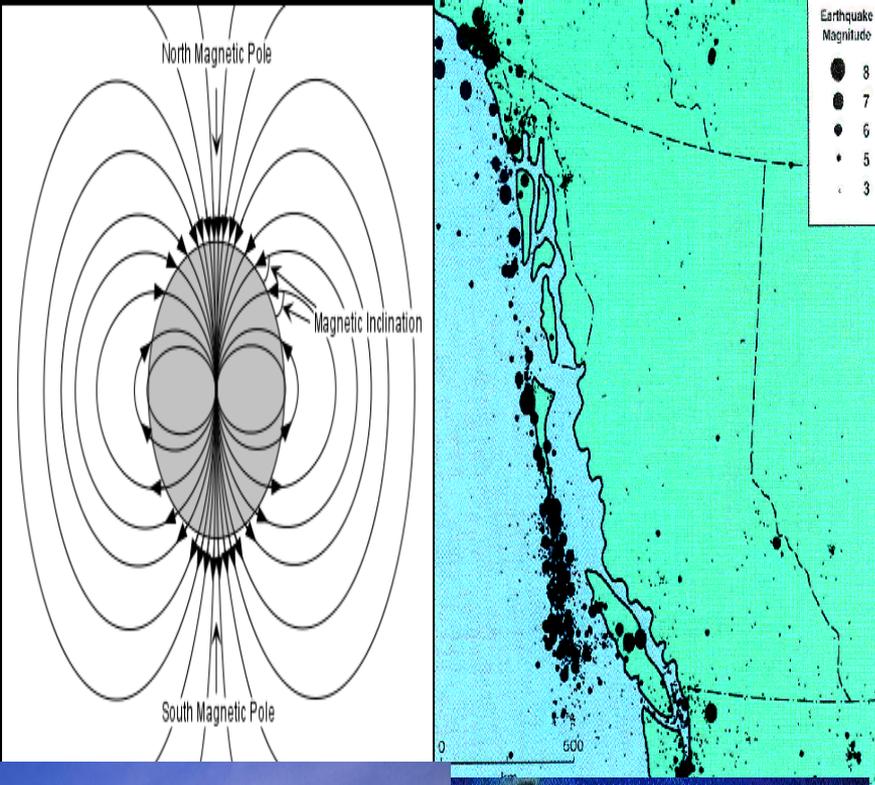
Oceanic-oceanic convergence

• Transform Boundaries

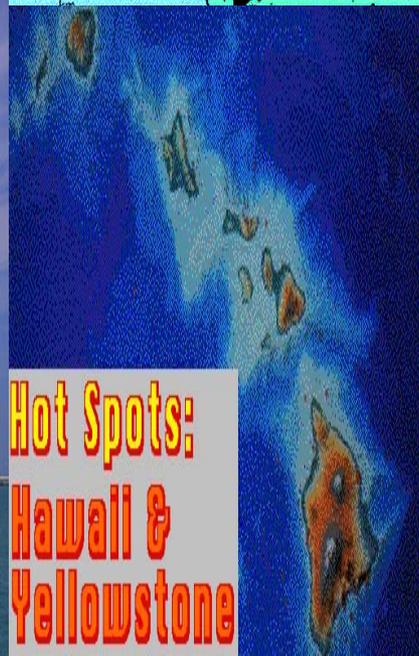
- Two plates grind past each other without production and destruction of lithosphere
- Ex: San Andreas Fault in California
- [Plate Boundary Rap](#)

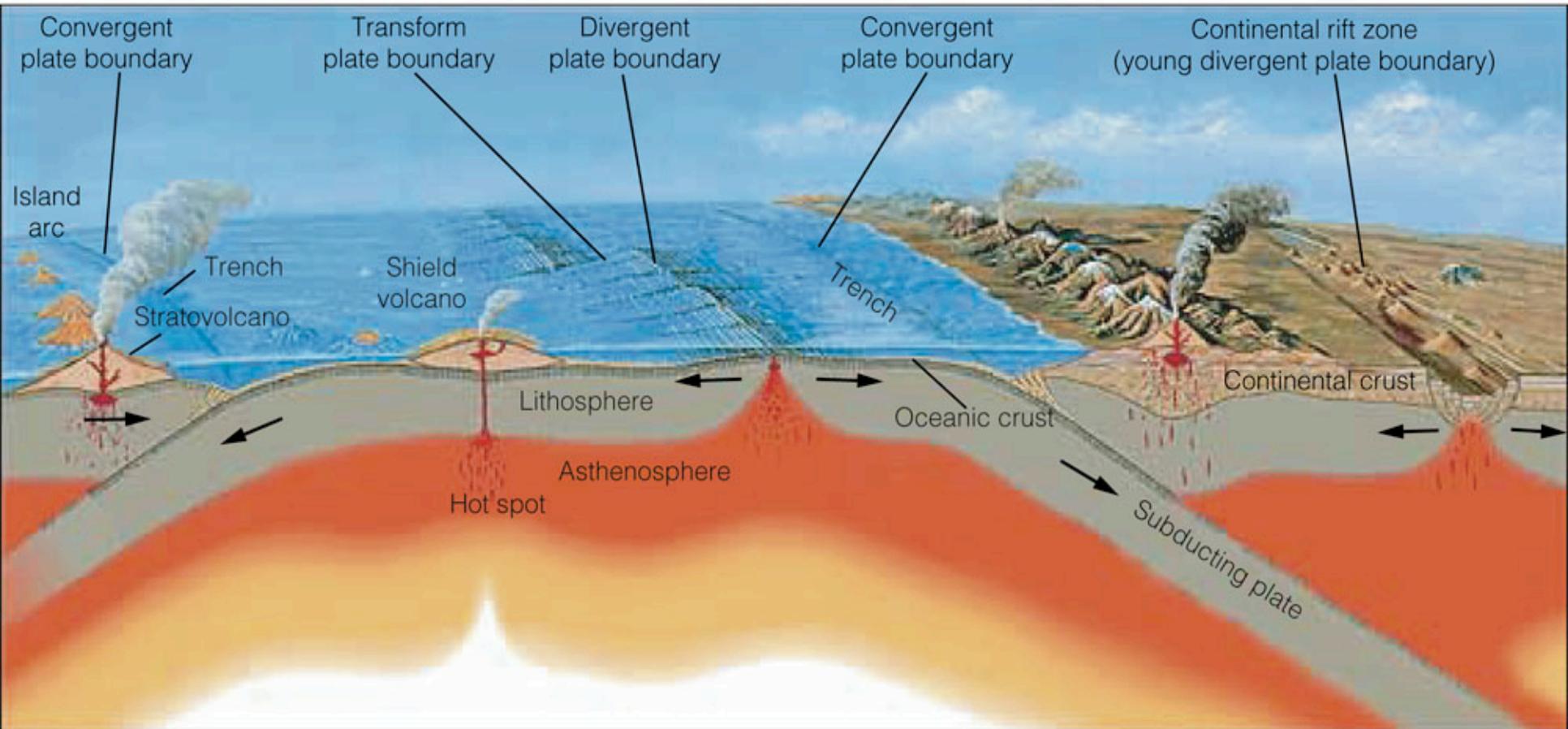
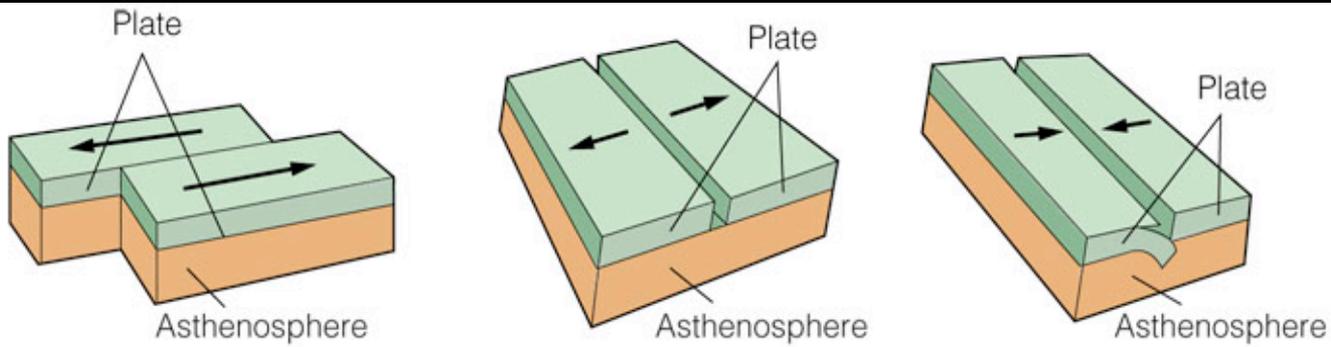


Evidence of Plate Tectonics



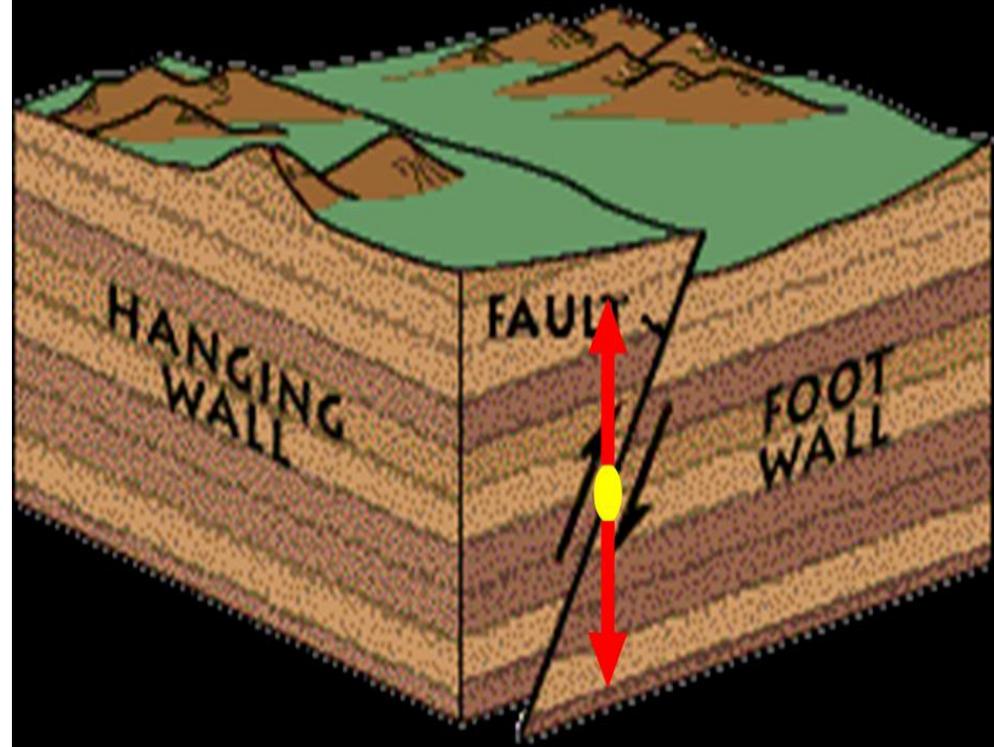
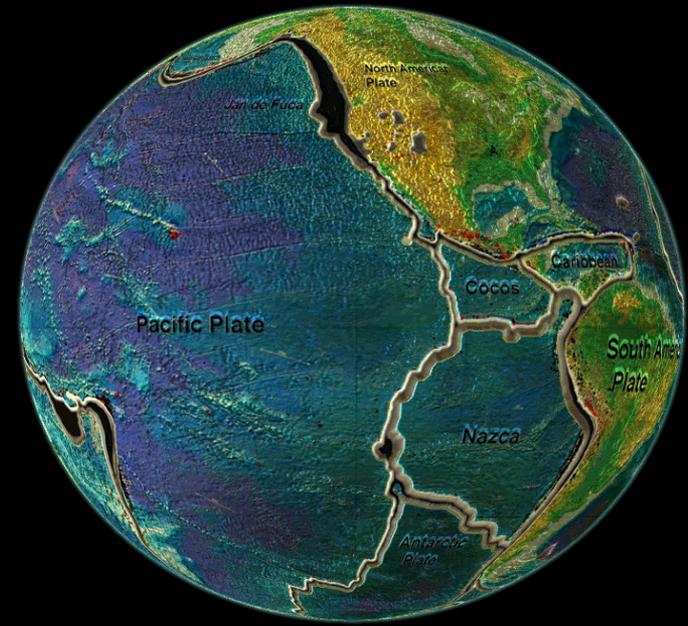
- **Paleomagnetism** : the permanent magnetization acquired by rock that can be used to determine the location of the magnetic poles at the time it became magnetized
- **Earthquake patterns**
- **Ocean Drilling**: younger oceanic crust is at the ridge crest and oldest oceanic crust is at the continental margins
- **Hot Spots**: supports that the plates move over Earth's surface

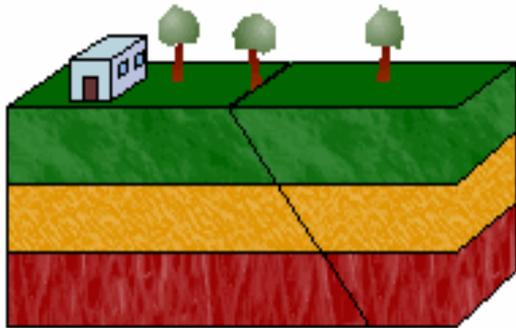




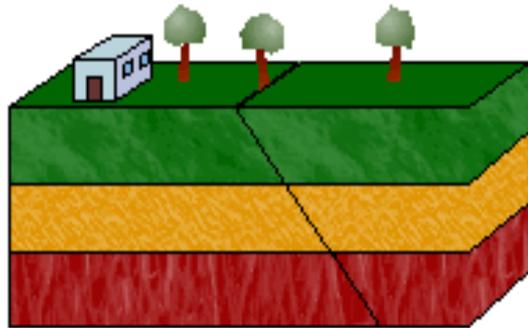
Faults

- Faults are formed by fractures in rocks
- Parts of a Fault
 - **Hanging wall:** rock above the fault line
 - **Foot Wall:** rock below the fault line

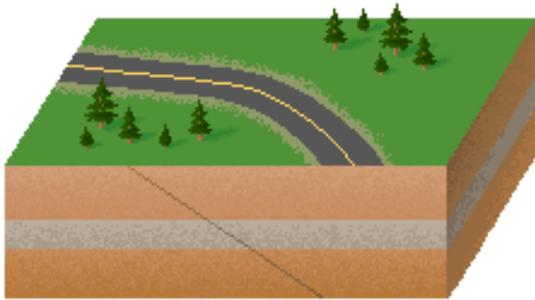




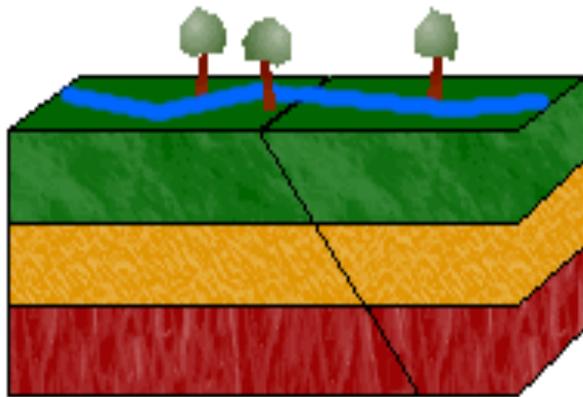
- **Normal:** Occurs when the hanging wall block moves down relative to the footwall block



- **Reverse:** A fault in which the hanging wall block moves up relative to the footwall block



- **Thrust:** Reverse fault with dips of less than 45 degrees



- **Strike-Slip:** Faults in which the movement is horizontal and parallel to the trend