

# Plate Tectonics

Introduction

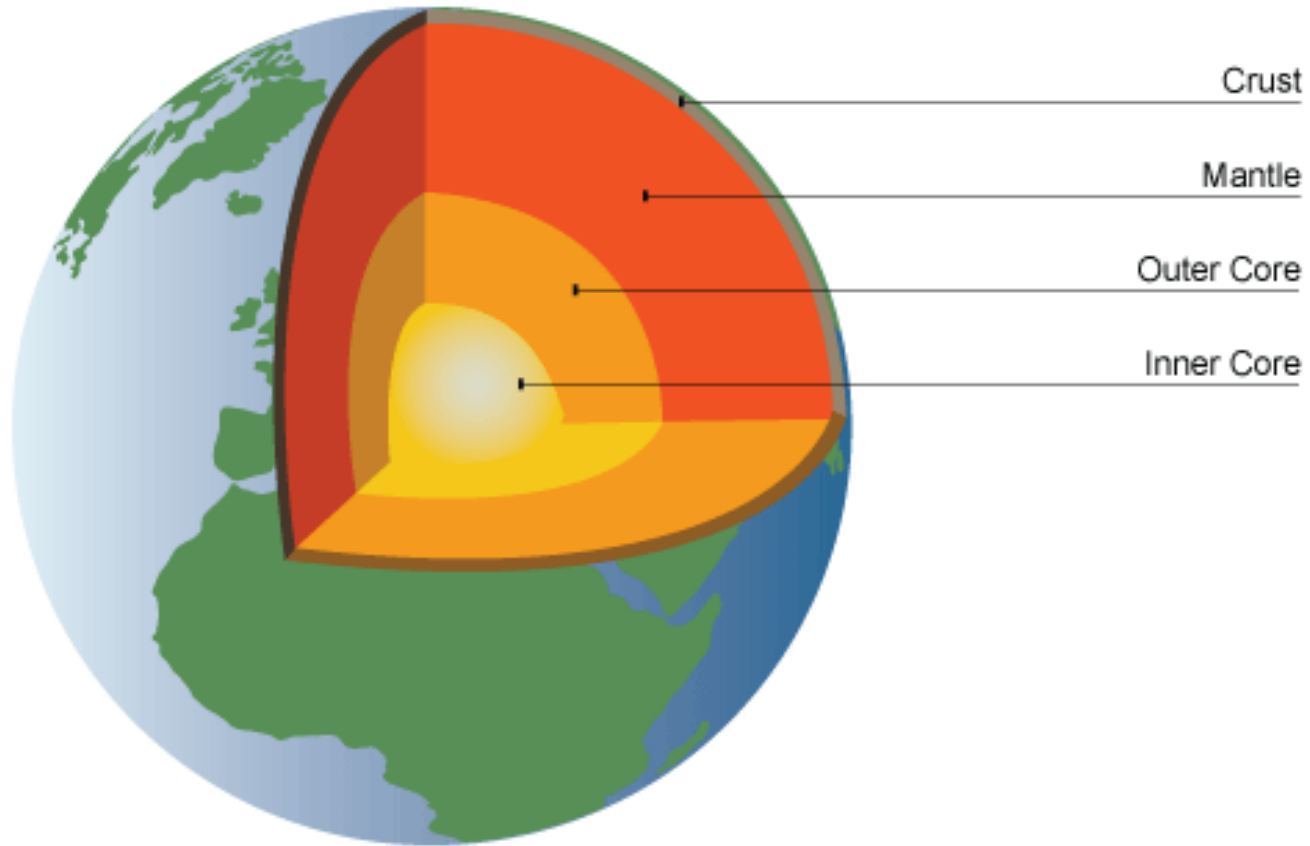


South Carolina  
Aquarium

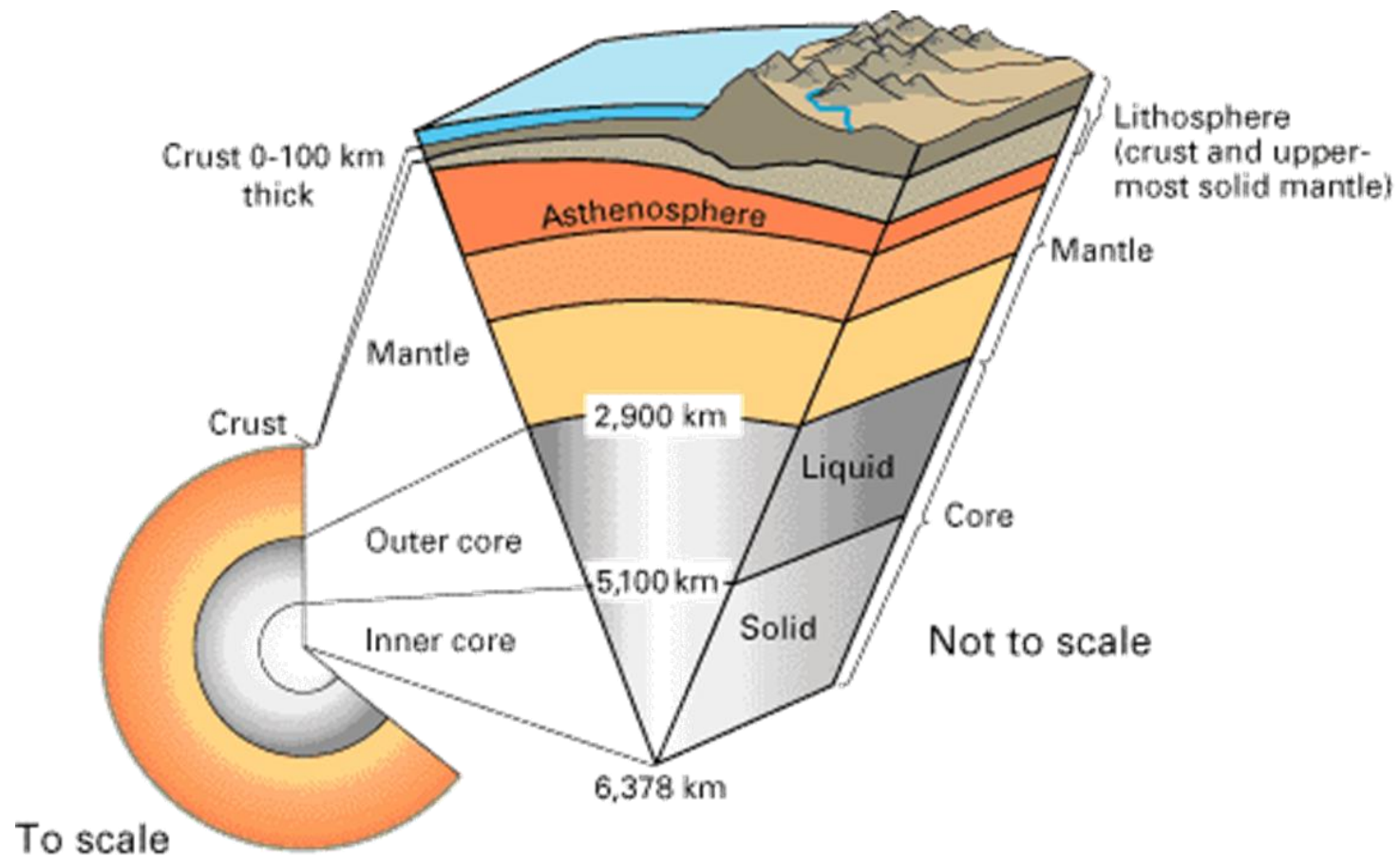
# Earth's Layers

- **Core**
  - > **Inner core – 800 miles thick; iron & nickel**
  - > **Outer core – 1400 miles thick; iron, nickel & sulfur**
- **Mantle – 1800 miles thick**
  - > **Inner mantle (Mesosphere) – hot and strong due to high pressure**
  - > **Outer mantle (Asthenosphere) – hot and semi-fluid**
- **Crust**
  - > **Lithosphere (crust and upper mantle)**
  - > **Oceanic (more dense) and Continental crust (less dense)**
  - > **0-62 miles thick**

# Earth's Layers

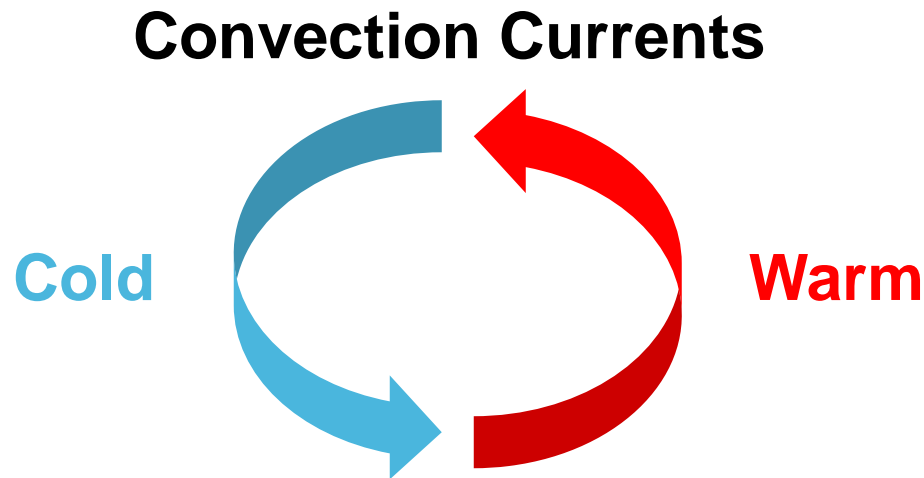


# Earth's Layers

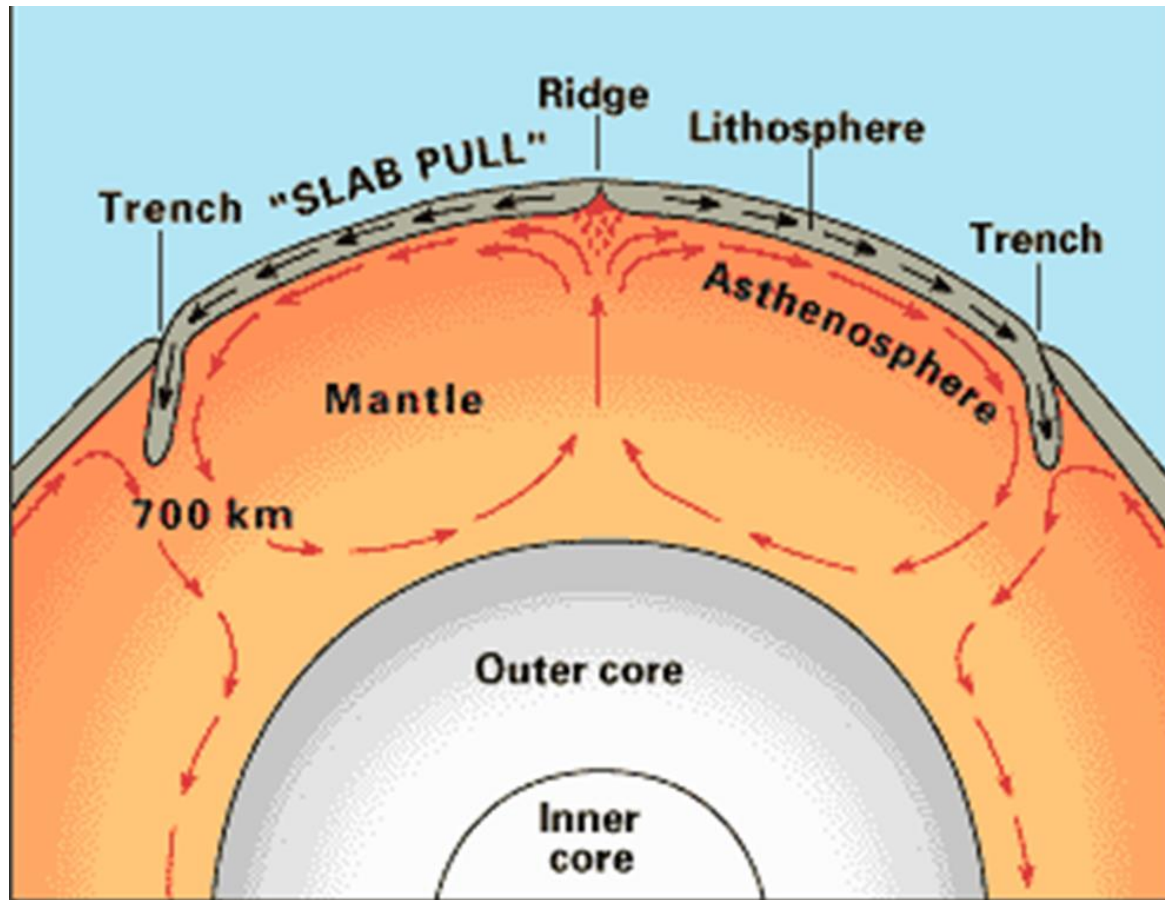


# Plate Tectonics

- The theory that the Earth's surface is made up of many plates that move over the inner mantle due to convection currents.

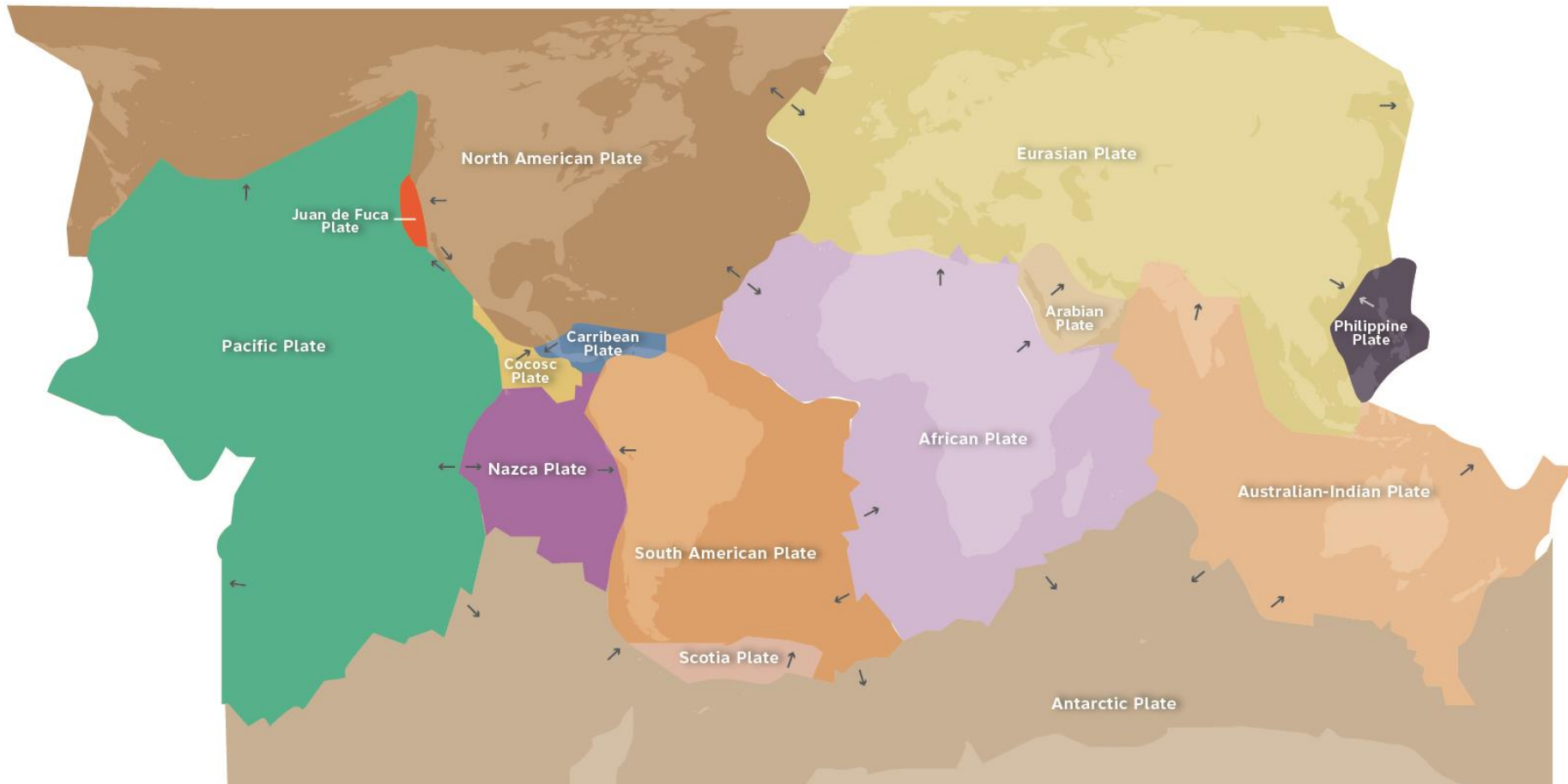


# Plate Tectonics



# The Earth's Plates

- 7-8 major plates
- Several smaller plates



# Plate Boundaries

- The area where plates come together
- 3 different plate boundaries
  - > **Convergent Boundary**
  - > **Divergent Boundary**
  - > **Transform Boundary**



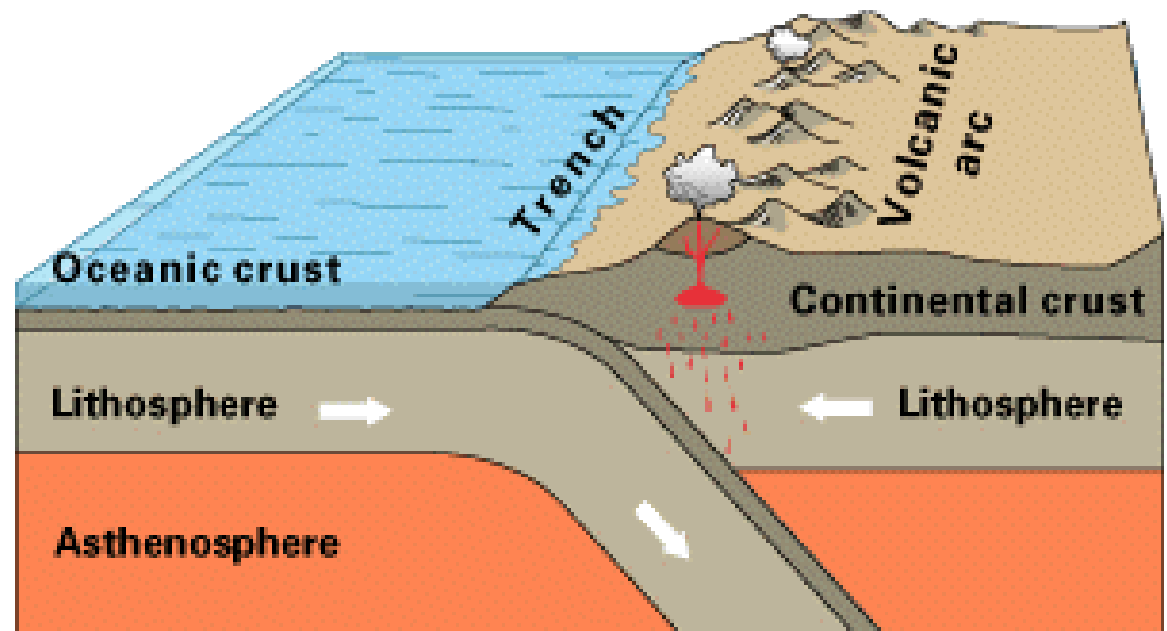
# Convergent Boundary

- Where plates move toward one another
- 2 things can happen
  - > **The plates collide**
  - > **One plate goes beneath the other – called a Subduction Zone**
- At a subduction zone, the more dense crust goes beneath the less dense crust
  - > **Oceanic crust more dense than continental crust**
  - > **Older crust more dense than younger crust**

# Convergent Boundary:

## Oceanic vs Continental Crust

- Volcanoes form on land
- Over time become mountains

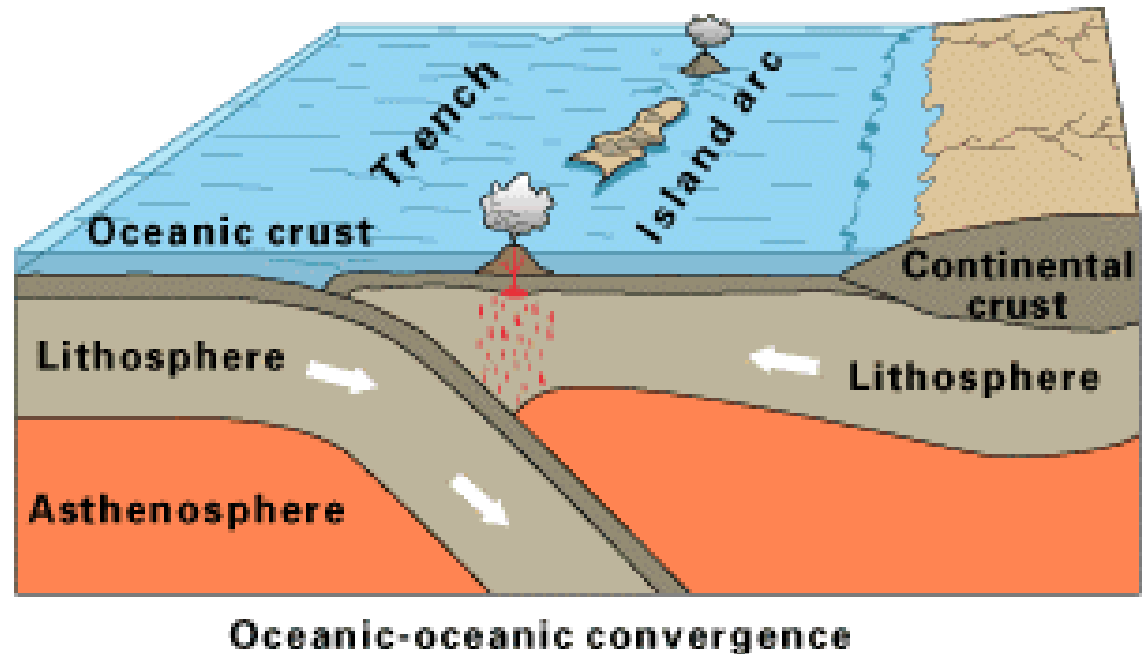


Oceanic-continental convergence

# Convergent Boundary:

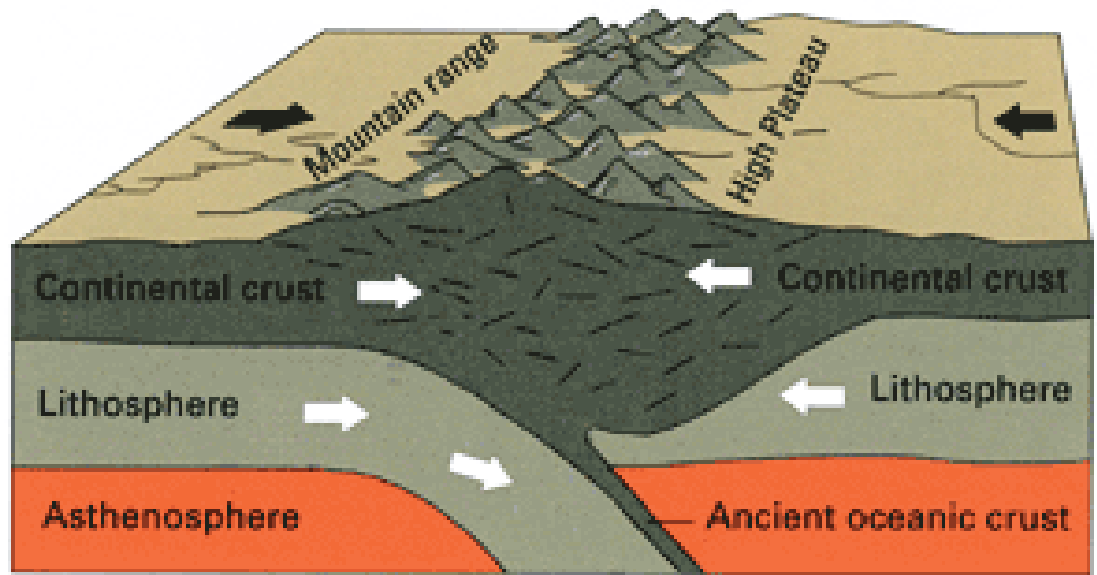
## Oceanic vs Oceanic Crust

- Volcanoes form under water
- Can become islands and over times island arcs



# Convergent Boundary: Continental vs Continental Crust

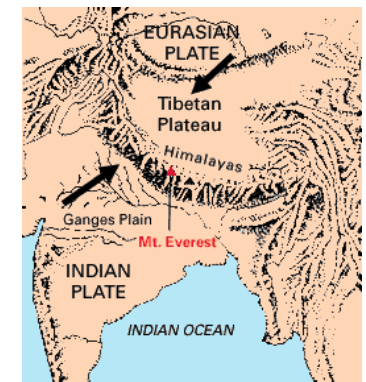
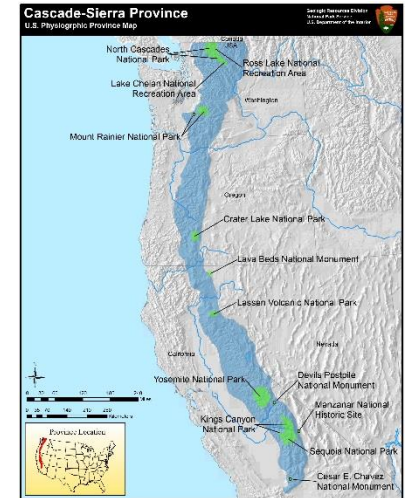
- Collide and form mountains



Continental-continental convergence

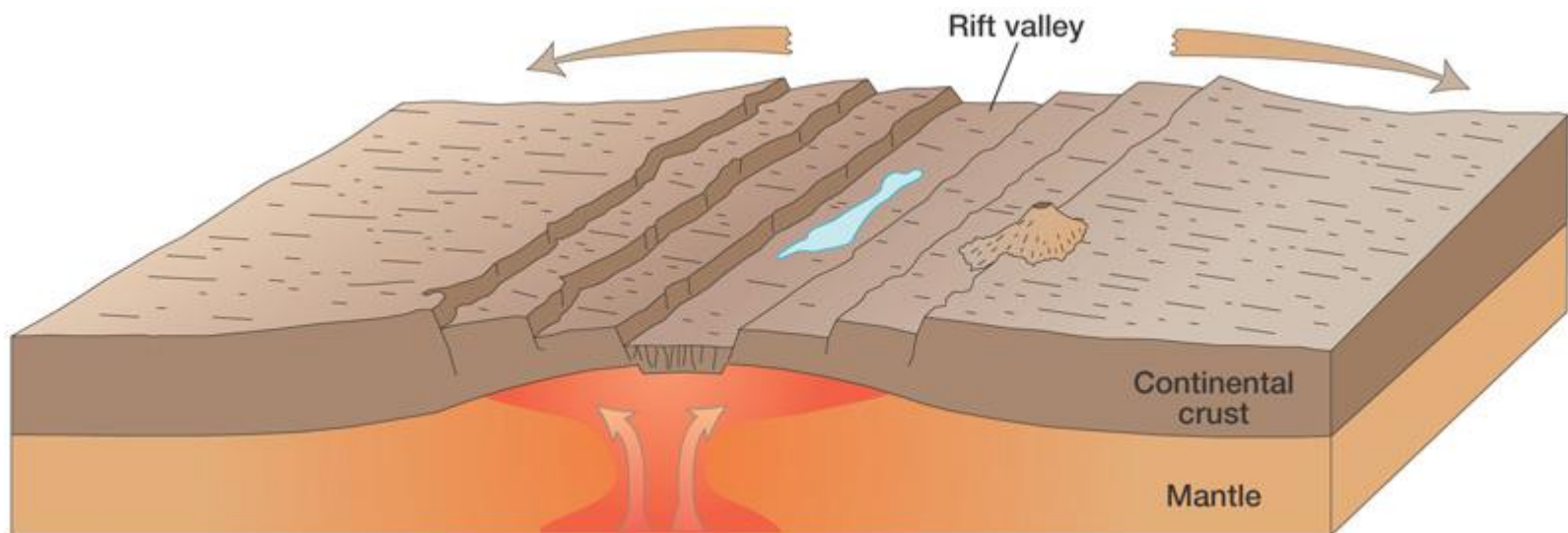
# Convergent Boundary Examples

- Oceanic vs Continental
  - > Cascade Mountains, Western USA
- Oceanic vs Oceanic
  - > Aleutian Islands, North Pacific Ocean
- Continental vs Continental
  - > Himalayan Mountains, South Asia



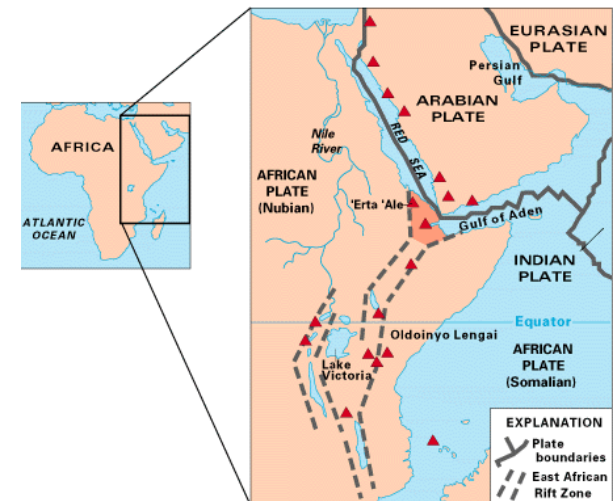
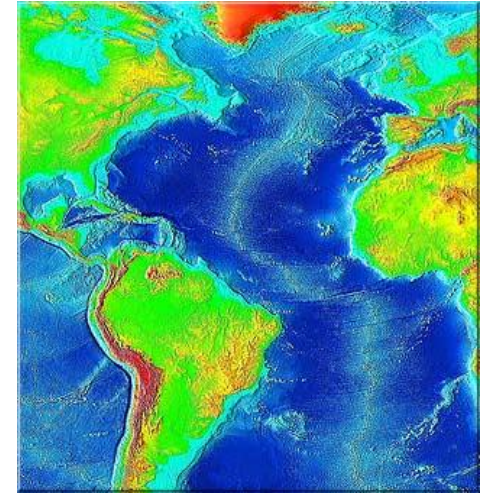
# Divergent Boundary

- Where plates move away from one another
- New crust fills in and creates a rift or ridge
- Over time as the rift grows, a rift valley can form



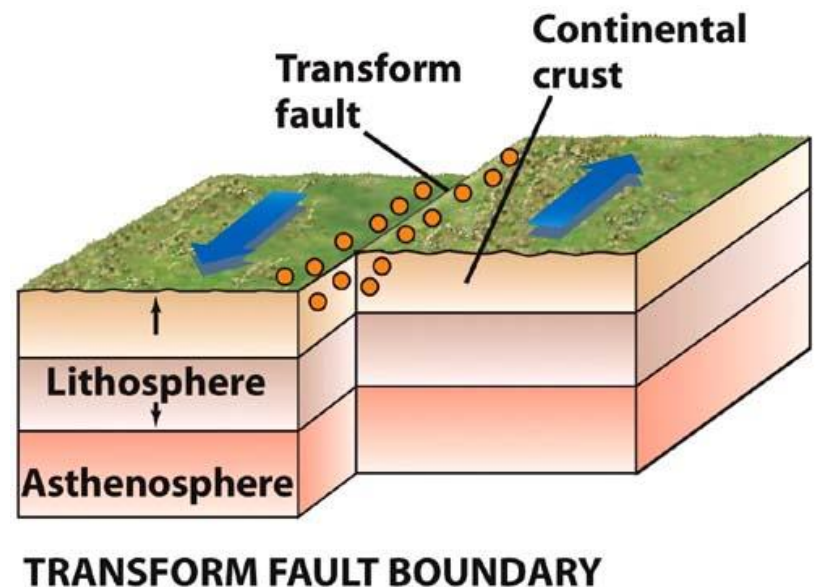
# Divergent Boundary Examples

- Oceanic & Oceanic
  - > Mid-Atlantic Ridge, Atlantic Ocean
- Continental & Continental
  - > Great Rift Valley, East Africa



# Transform Boundary

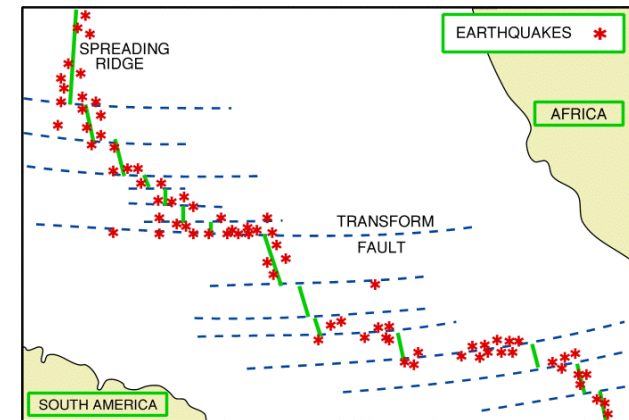
- Where plates slide past one another
- Crust is not being made or destroyed
- Earthquakes are common at transform faults



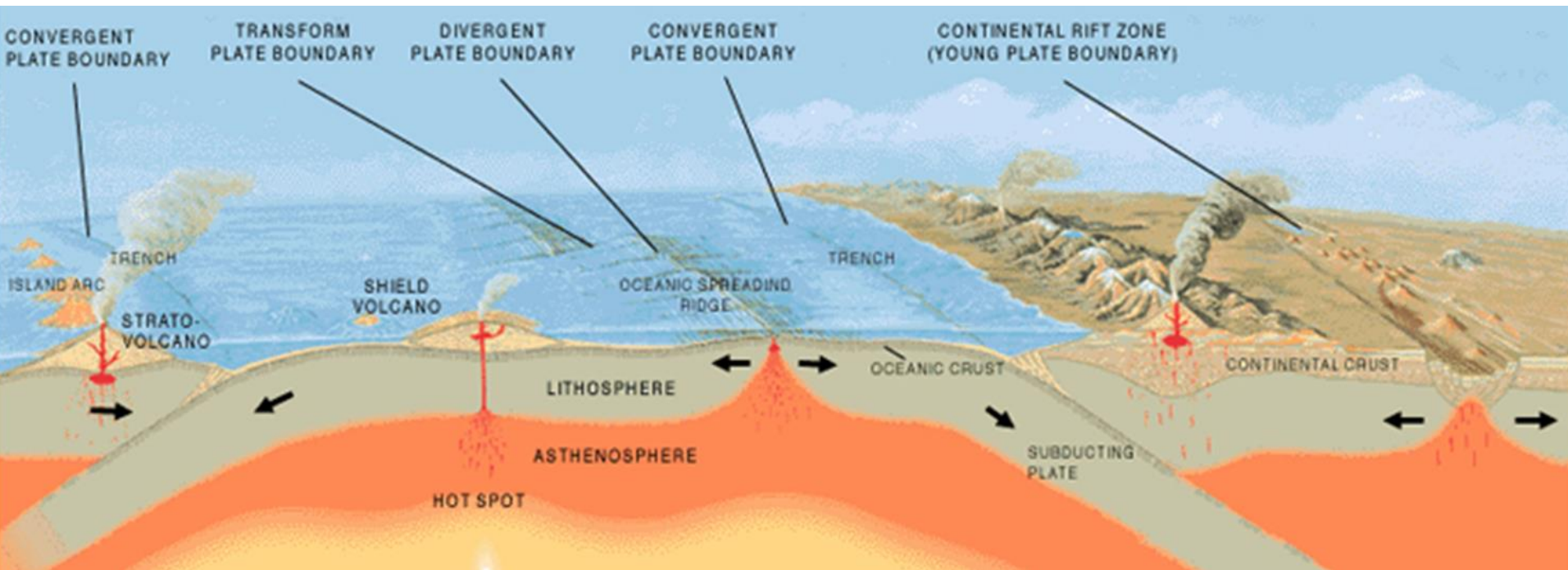


# Transform Boundary Examples

- Oceanic & Oceanic
  - > Mid-Atlantic Ridge faults, Atlantic Ocean
- Continental & Continental
  - > San Andreas Fault, California



# Plate Boundaries



# Earth's History

- The Earth is about 4.6 billion years old
- New oceanic crust is always being formed
- The oldest ocean sediment on record is 200 million years old
- Continental crust is much older
- The oldest continent sediment has been aged to 3.8 billion years
- Scientists can use the shape of the land as well as fossils to study plate tectonics

# Plate Tectonics and Fossils

- Fossil evidence links continents together

