

Chapter 12.2 Features of Plate Tectonics

The Earth

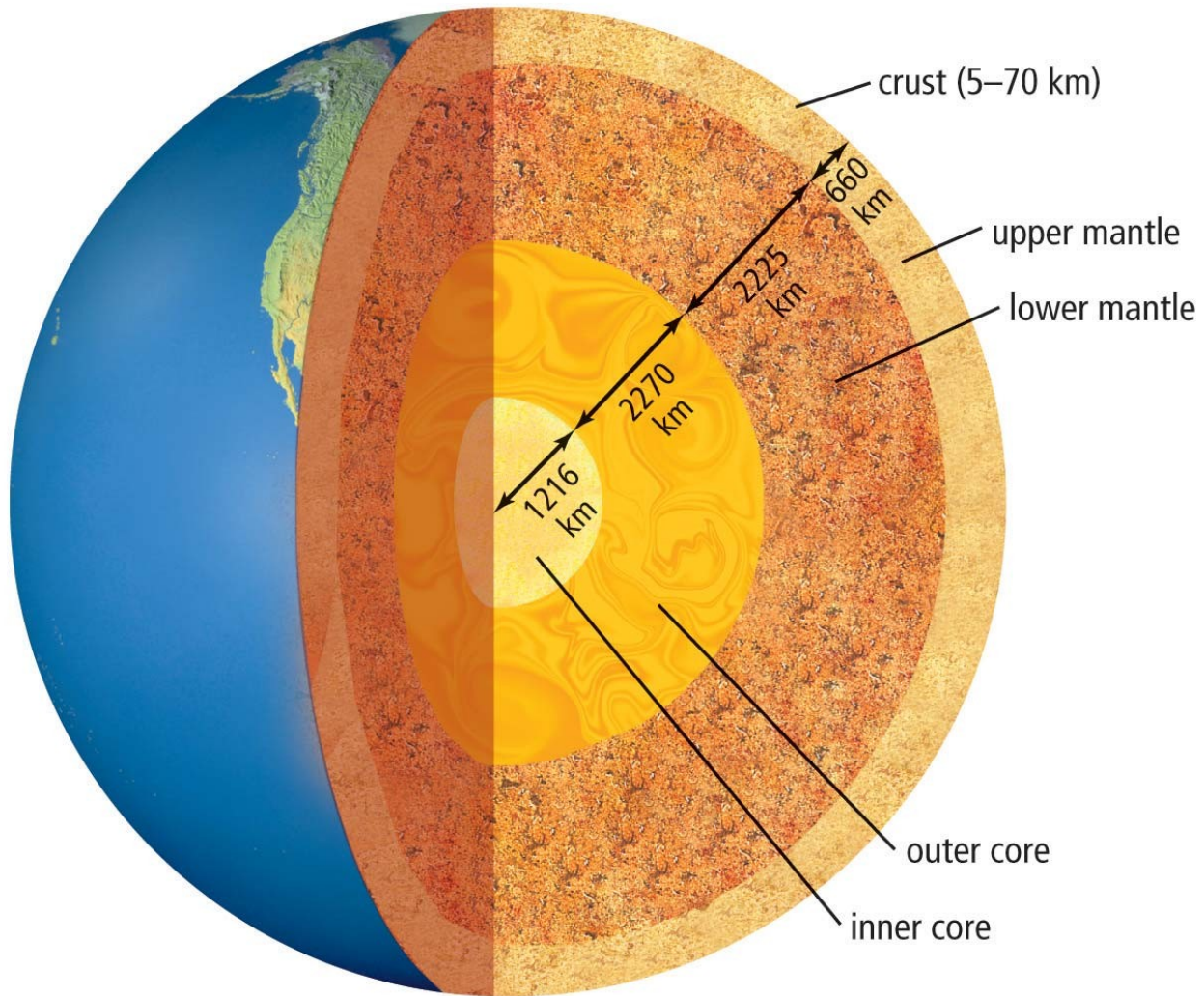


Figure 12.13 A cross-section of Earth

Tectonic Plates (12 major and many smaller) - forms the **lithosphere** (65-100km thick)

- ocean plates – basalt (dense rock)
- continental plates – granite (lighter)

Plate motion

- **asthenosphere** – partly molten layer below the lithosphere in the upper mantle
 - convection currents in this layer from hot magma rising, cooling and sinking – driving force behind plate movement

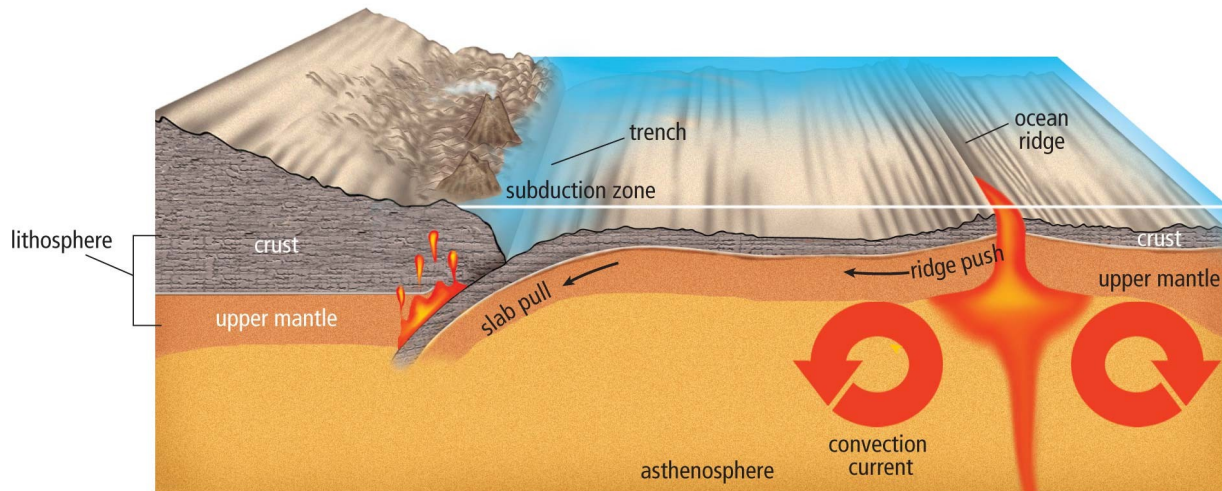


Figure 12.13 Thermal energy from inside Earth, gravity, and tectonic plate interactions affect the movement of tectonic plates.

- **Ridge Push**
 - rising currents of magma reach Earth's surface at spreading centres. Magma cools and becomes new rock. Tectonic plates move away from the ridge
 - ocean – spreading ridge / oceanic ridge
 - land – rift valley
- **Subduction** – dense oceanic plate collides with a lighter continental plate – heavier plate pushes below lighter plate
 - subduction zones - earthquakes and volcanic eruptions
 - slab pull – as edge of plate subducts into mantle it pulls the rest of the plate with it

Plate Interactions

- plate boundaries – where two tectonic plates come in contact with each other

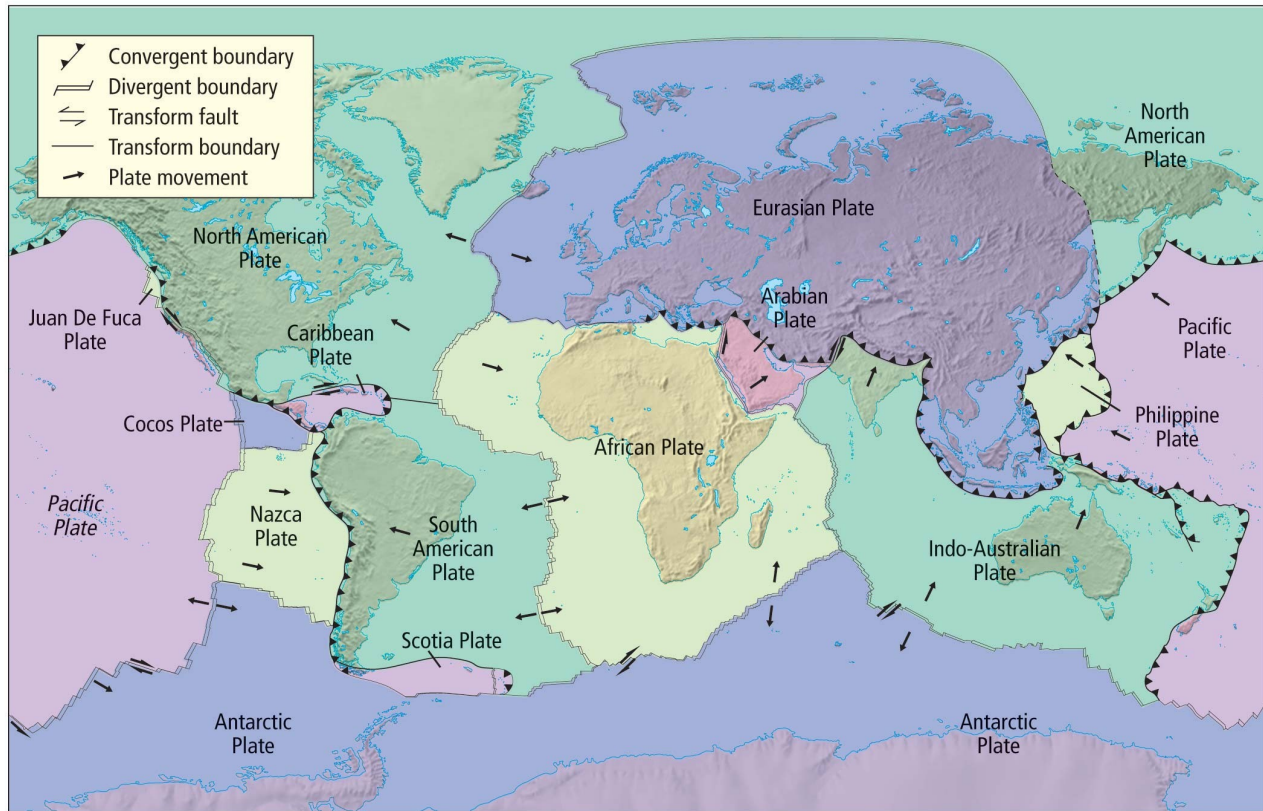


Figure 12.17 Tectonic plate boundaries

1. Divergent plate boundaries – plates spread apart
 - mid-atlantic ridge, East Africa Rift

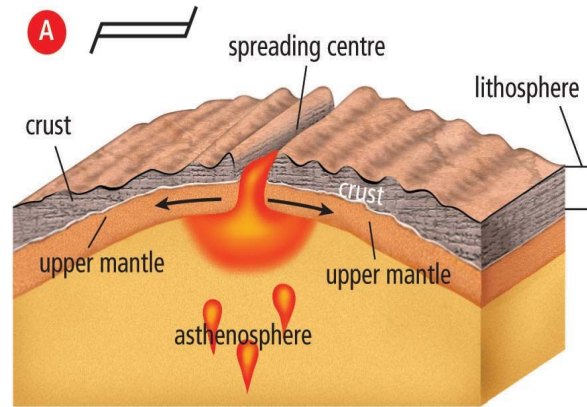
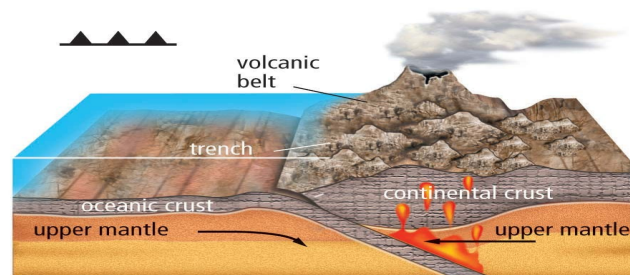


Figure 12.18 A spreading centre at a divergent plate boundary (A). The East African Rift (B)

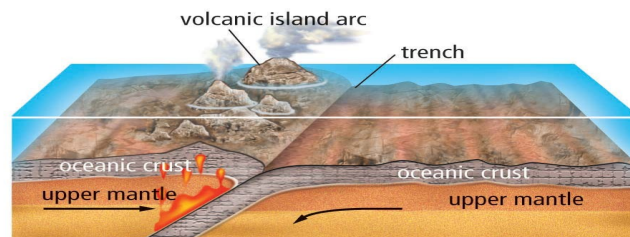
2. Convergent Plate Boundaries – plates collide
 - Oceanic-continental plate convergence
 - oceanic plate subducts beneath continental plate – forms a trench
 - as plate moves deeper it begins to melt – forms cone shaped volcanoes
 - continental plate begins to crumble and fold forming mountain ranges (Coast Mountains)
 - building pressure between plates results in earthquakes

- Oceanic-oceanic plate convergence
 - denser plate will slide deep into mantle
 - results in long chain of volcanic islands – volcanic island arc (ex Japan, Indonesia, Aleutian Islands of Alaska)

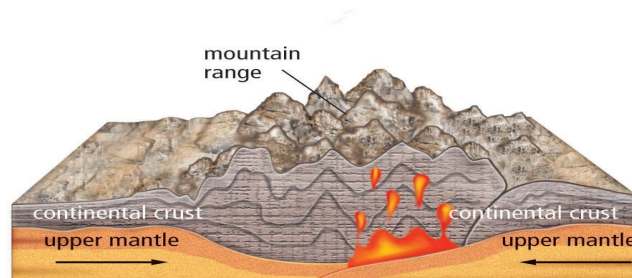
- Continental-continental plate convergence
 - edges fold and crumble creating mountain ranges (ex Himalays)



A. The convergence of an oceanic and a continental plate produced the Coast Mountains of British Columbia.



B. The convergence of two oceanic plates can produce a volcanic island arc, such as the Aleutian Islands of Alaska, in the United States.



C. The convergence of two continental plates is gradually forcing the Himalayas higher.

Figure 12.19 Convergent plate boundaries

3. Transform Plate Boundaries – plates slide past each other
- result in earthquakes and transform faults (break in rock layers)

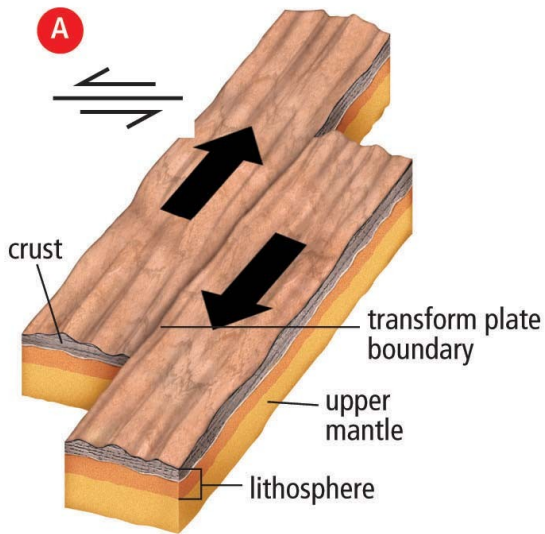


Figure 12.20 Transform faults can occur when tectonic plates move alongside one another (A). The San Andreas Fault is in the United States (B).