

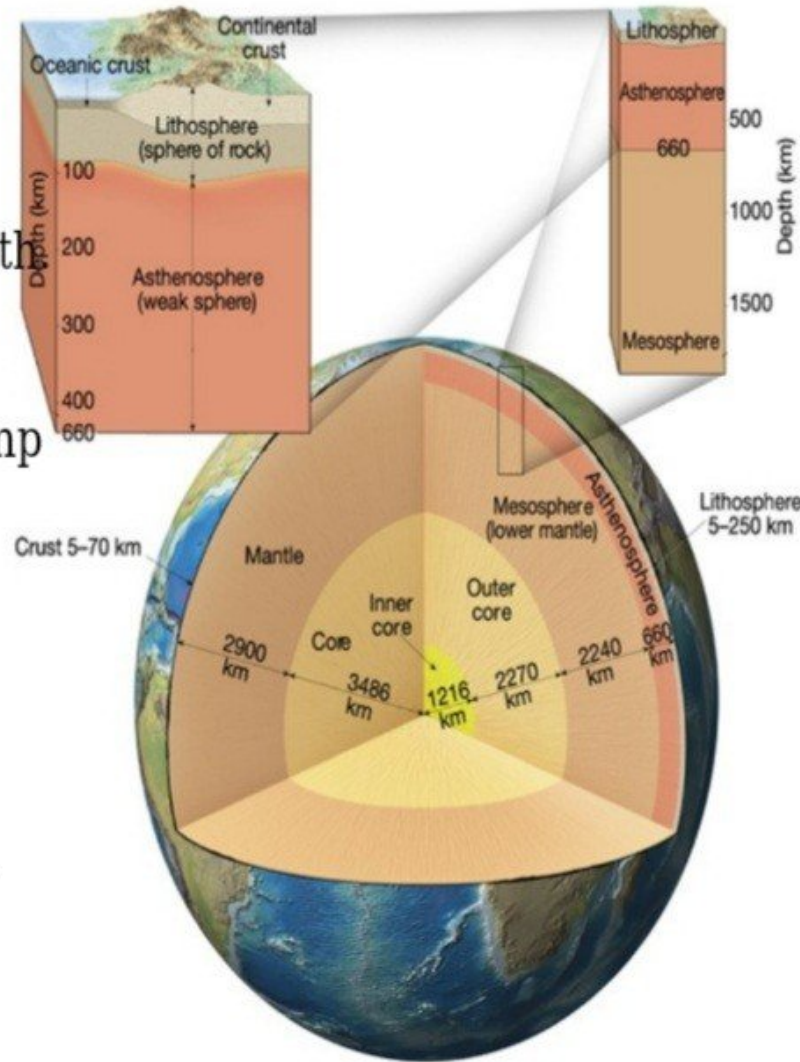
# Earth's Internal Structure

The Earth's interior is characterized by a gradual increase in temperature, pressure and density with depth.

At only 100 km depth, the temperature is  $\sim 1300^{\circ}\text{C}$ .

At the Earth's center, the temperature is  $>6700^{\circ}\text{C}$ .

The pressure in the crust increases  $\sim 280$  bars for every kilometer depth.

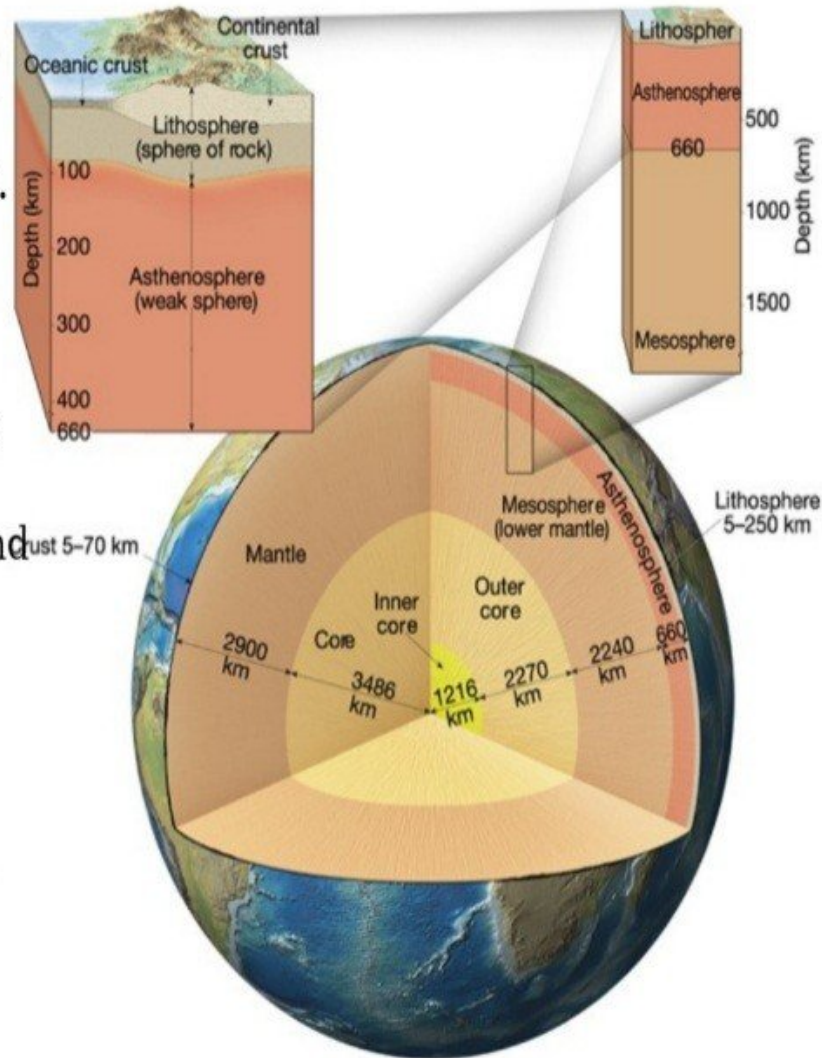


# Earth's Internal Structure

The Earth consists of 3 major regions marked by differences in chemical composition.

Crust: rigid outermost layer of the Earth.  
Consists of two types:

1. **oceanic** - 3-15 km thick and is composed of basalt (igneous). Young (<180 million years old).
2. **continental** - up to 70 km thick and composed of a wide variety of rock types (ave. granodiorite).



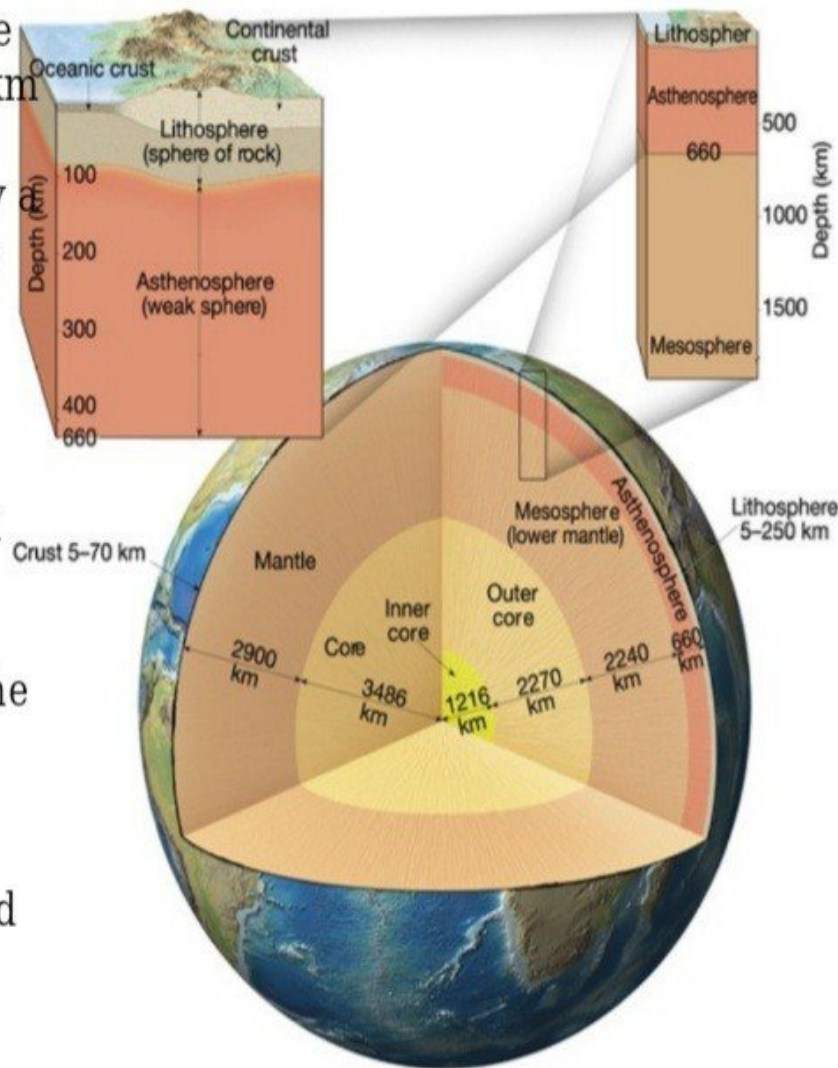
# Earth's Internal Structure

**Mantle:** comprises ~82% of the Earth by volume and is ~2900 km thick.

- The mantle is characterized by change in composition from the crust.
- The mantle is able to flow (plastically) at very slow rates.

**Core:** composed of iron, nickel and other minor elements.

- The outer core is liquid — capable of flow and source of the Earth's magnetic field.
- The inner core is solid Fe-Ni. There is no major chemical difference between the outer and inner core.



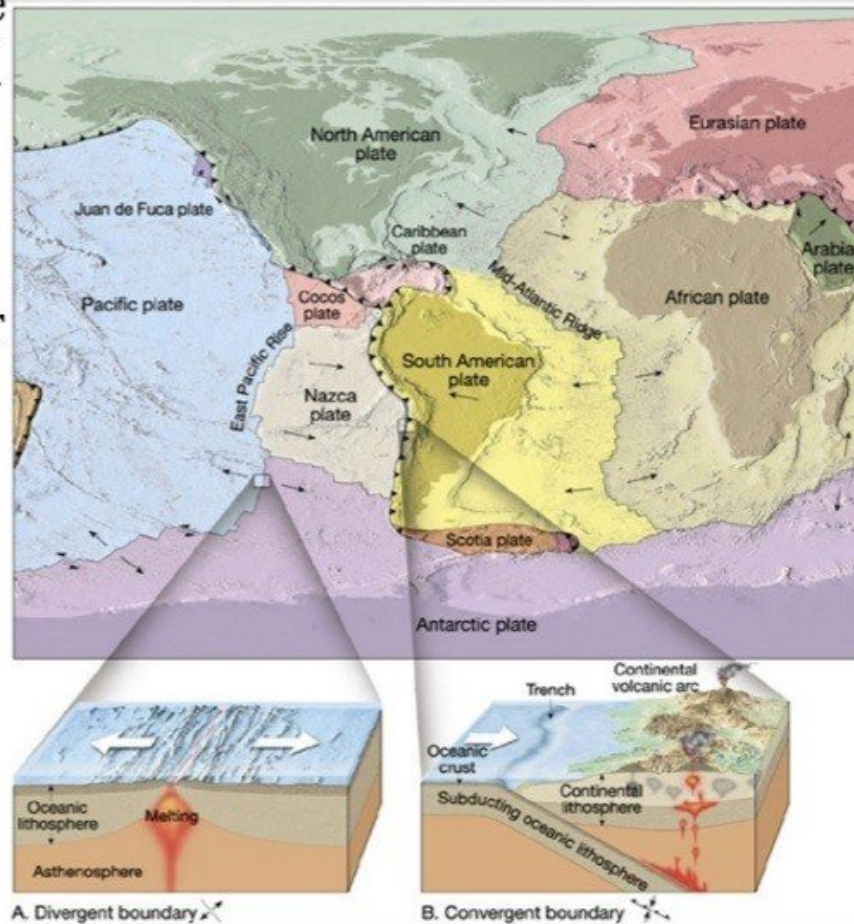
# Plate Tectonics

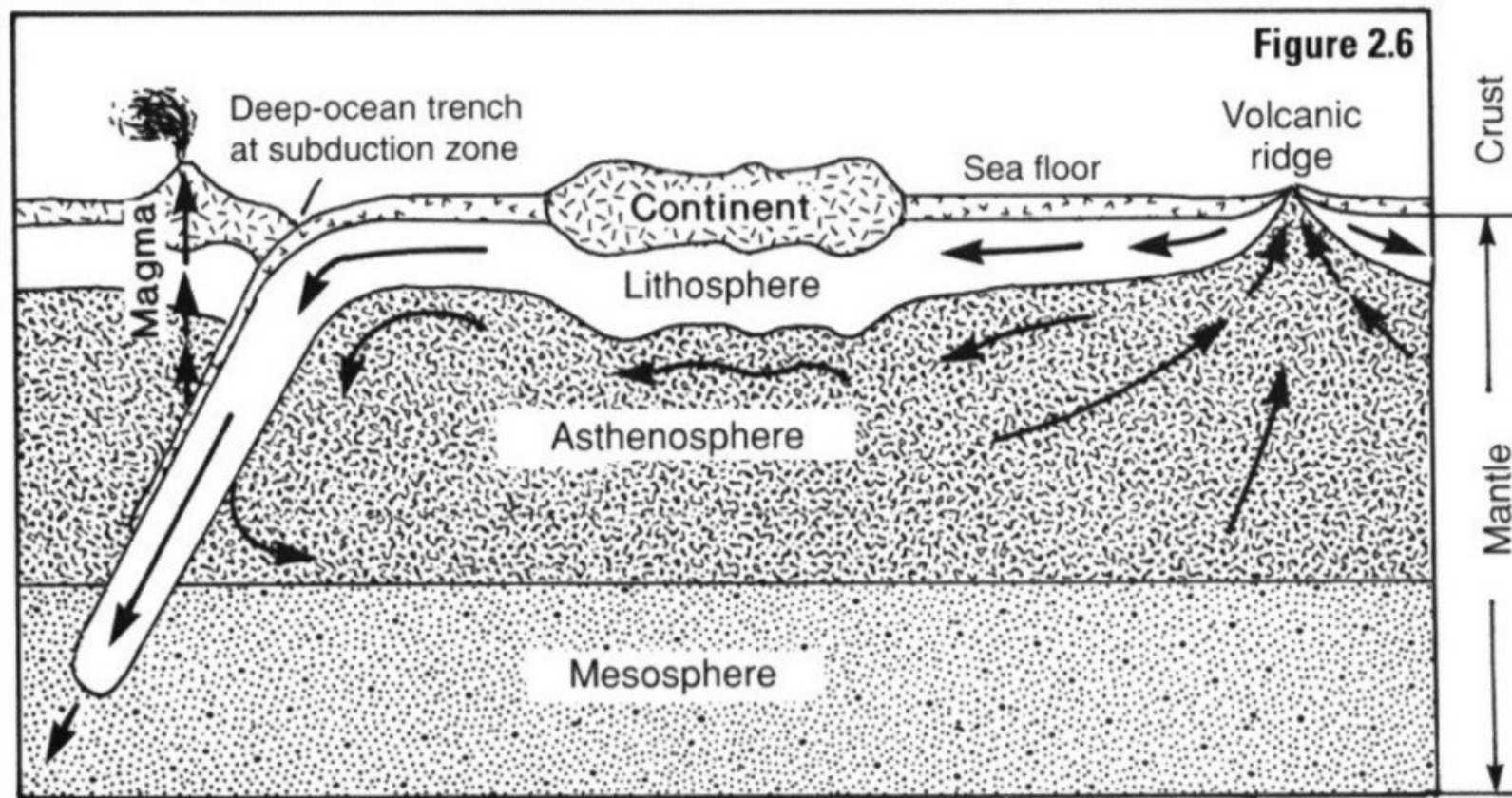
A relatively recent theory that the Earth's crust is composed of rigid plates that move relative to one another.

Plate movements are on the order of a few centimeters/year - about the same rate as your fingernails grow!

There are 3 types of plate boundaries:

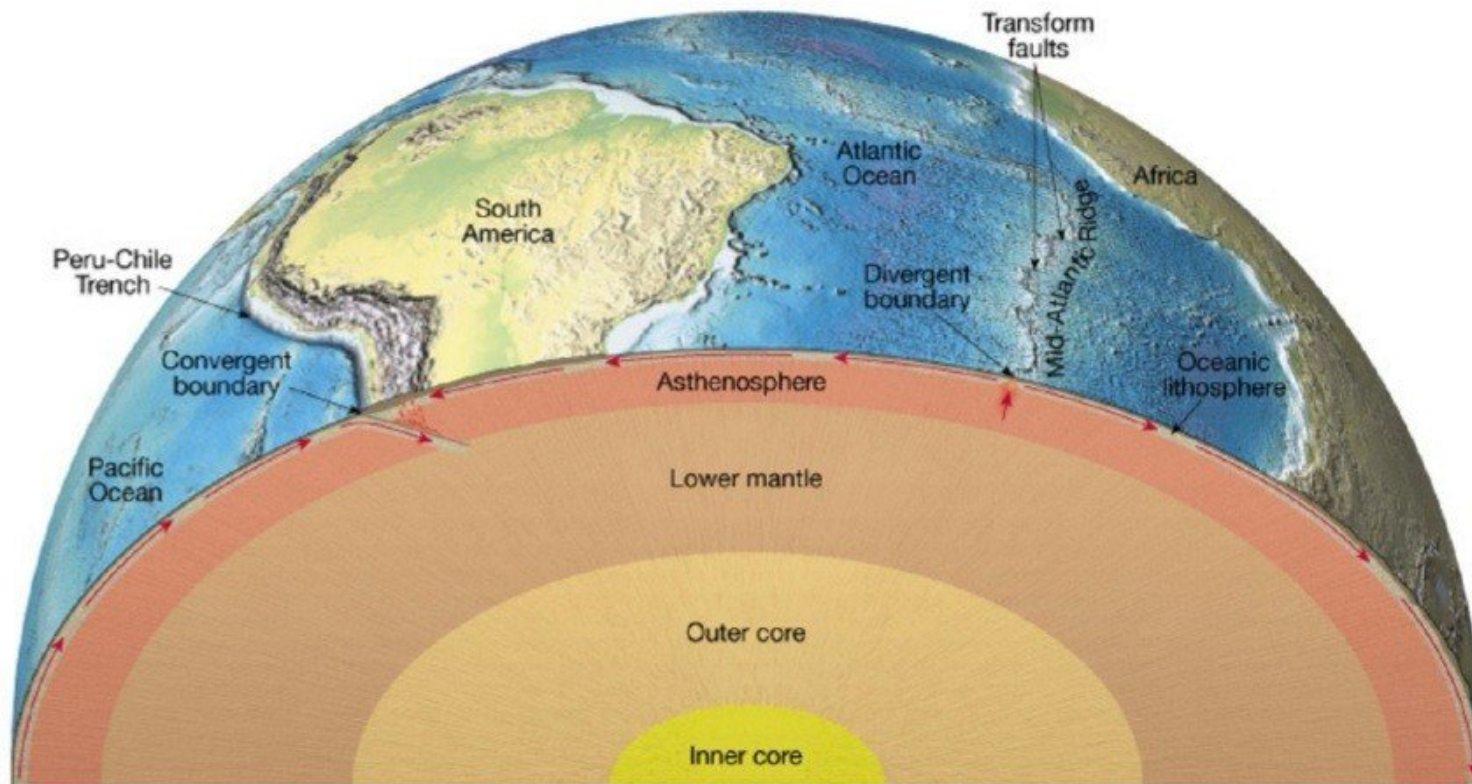
1. divergent
2. convergent
3. transform





# Plate Tectonics

- **Convergent boundaries** - plates move together forming a subduction zone and mountain chains.
- **Divergent boundaries** - plates move apart forming the mid-ocean ridge and seafloor spreading.
- **Transform boundaries** - plates grind past one another. These boundaries subdivide the mid-ocean ridge and also form the San Andreas fault system.



# Plate Margins

