

III. The Three Main Layers of Earth

A. Crust: The layer of rock that forms Earth's outer surface.

1. The crust includes both dry land and the ocean floor.
2. On the crust you find rocks and mountains; it also includes the soil and water that cover large parts of Earth's surface.
3. The outer rind of rock is much thinner than the layer beneath it.
4. The crust is thickest under high mountains.
5. The crust is thinnest beneath the ocean.
6. In most places, the crust is between 5 - 40 km thick, but it can be up to 70 km thick beneath mountains.
7. **oceanic crust:** the crust beneath oceans
8. **continental crust:** the crust that forms the continents

B. The Mantle: the layer of hot, solid material between Earth's crust & core

1. Scientists divide the mantle into layers based on the physical characteristics of those layers
 - a. **The Lithosphere:** a rigid layer made up of the uppermost part of the mantle and the crust; averages about 100 km thick
In Greek, lithos means "STONE"

b. **The Asthenosphere:** the soft layer of the mantle on which the lithosphere floats; less rigid than the rock above it but still solid
In Greek, asthenes means "WEAK"

c. **The Lower Mantle:** beneath the asthenosphere, it is solid, and extends all the way to Earth's core

2. Overall, the mantle is about 3,000 km thick.

C. The Core: consists of 2 parts.

1. **The Outer Core:** a layer of molten iron and nickel that surrounds the inner core of Earth
2. **The Inner Core:** a dense sphere of solid iron and nickel at the center of Earth.
 - a. Extreme pressure squeezes the atoms of iron & nickel so much that they cannot spread out & become liquid.

3. The Core and Earth's Magnetic Field

- a. Scientists think that the movements in the liquid outer core create Earth's magnetic field; causing the planet to act like a giant bar magnet.
- b. When you use a compass, the compass needle aligns with the lines of force in Earth's magnetic field.