



B. A Journey to the Center of Earth



The three main layers of Earth are the crust, the mantle, and the core; layers vary greatly in size, composition, temperature, and pressure.

1. **Temperature:** right below surface the rock is cool; at about 20 m it gets warmer; then the temp. rises 1° for every 40 m for several tens of km; then the temp. increases slowly.

The high temps. are the result of heat left over from the formation of the planet and radioactive substances inside Earth

2. **Pressure:** the force exerted on a surface divided by the total area over which the force is exerted.

Because of the weight of the rock above, pressure inside Earth increases as you go deeper.

C. The Crust : layer of rock that surrounds Earth's surface; includes land and the ocean floor; outer rind is thin; is thickest under mountains and thinnest beneath oceans; ave is 5-40 km thick but can be 70 km thick beneath mountains

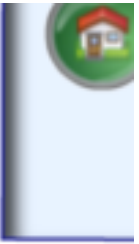
1. **Oceanic crust:** crust beneath the ocean; consists of **basalt:** a dark dense rock with a fine texture
2. **Continental crust:** crust that forms the continents consists mainly of rocks such as **granite:** a light-colored rock with a coarse texture

D. The Mantle: layer of hot, solid material between Earth's crust and core; about 40 km beneath the surface; divided into layers; overall, about 3,000 km thick



1. **Lithosphere:** a rigid layer made up of the uppermost part of the mantle and the crust; about 100 km thick
2. **Asthenosphere:** the soft layer of the mantle on which the lithosphere floats
3. **The Lower Mantle:** solid material beneath the asthenosphere that extends all the way to Earth's core

E. The Core: made mostly of the metals iron and nickel; consists of two parts:



1. **outer core:** a layer of molten iron and nickel that surrounds the inner core of Earth
2. **inner core:** a dense sphere of solid iron and nickel at the center of Earth
3. **The Core and Earth's Magnetic Field:** movements in the liquid outer core create Earth's magnetic field; causes the planet to act like a giant bar magnet