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