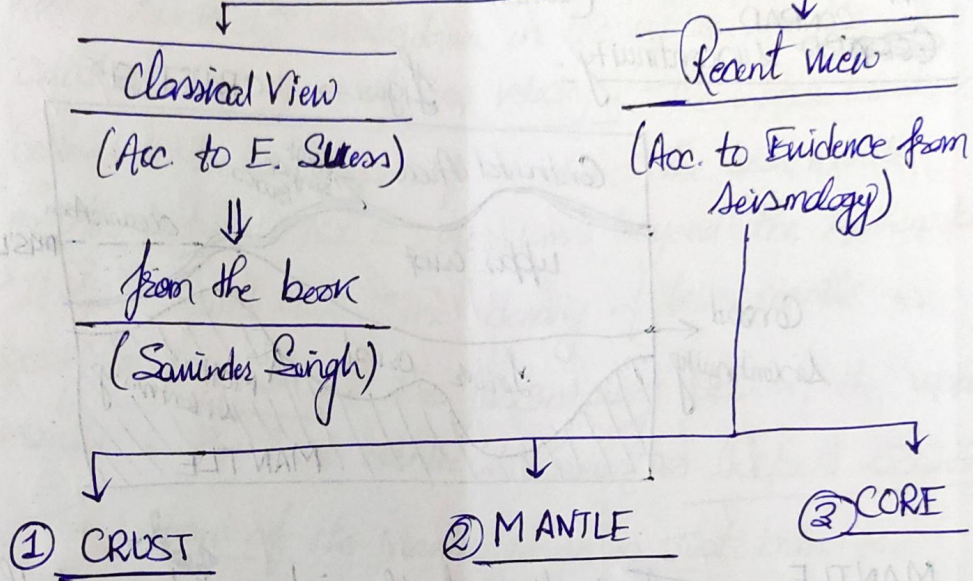


Structure of the Interior of the Earth

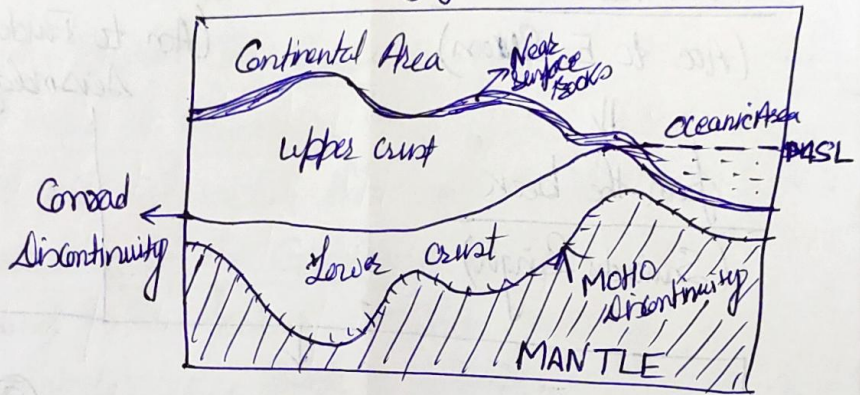
The Structure of the Earth's interior is fundamentally divided into two sub-groups →



01) CRUST → It is the outermost & Solid part of the Earth. It is "brittle" in nature. The thickness of the crust varies under oceanic & Continental areas. The mean thickness of oceanic crust is 5 km whereas that of the Continental is around 30 km. The Continental crust is thicker in the areas of major mountain systems. It is as much as 70 km thick in the Himalayan Region. So, its thickness varies normally about 8-40 km. It is made up of Heavier rocks having density of 3 gm/cm^3 . This type of rock found in the oceanic crust is Basalt. ~~The mean density of material in oceanic crust is 2.5 gm/cm^3~~ Nearly 1% of the Earth's

Volume & 0.5% of the Earth's Mass are made of the crust. Major constituent elements of crust are Silica (SI) & Aluminium (AI). The discontinuity between the upper & lower crust (Continental & oceanic) is termed as the CONRAD Discontinuity.

Figure → CRUST & MANTLE



02) MANTLE → The portion of the interior ^{of the Earth} beyond the crust is called Mantle. The discontinuity between the crust & Mantle is called as the Mohorovich Discontinuity. The Mantle extends from Moho's Discontinuity to a depth of 2900 km. Nearly 84% of the Earth's volume & 67% of the Earth's mass is occupied by the Mantle. The major constituent elements of the Mantle are Silicon (SI) & Magnesium (Mg). The ~~upper~~ crust & the uppermost part of the Mantle are called Lithosphere. Its thickness range from 10-200 km. The upper portion of the Mantle is called ASTHENOSPHERE. The word Asthenosphere means Weak. It is considered to be extending upto 400 km. It is the main source of Magma that finds its way to

Just below the Lithosphere

the surface during volcanic eruption. It is the layer over which the lithospheric plates (continental & oceanic) move (plate tectonics). It has a density higher than the crust is 3.4 gm/cm^3 . The velocity of seismic ~~waves~~ waves relatively slows down in the upper mantle. This is called as the zone of low velocity. The upper mantle is believed to be the depth of 700 km. The lower mantle extends between 700 to 2900 km beyond the Asthenosphere. It is in solid state. The density of lower mantle is nearly 5.4 gm/cm^3 . The discontinuity between the upper mantle & the lower mantle is known as Repetti discontinuity.

The portion of the mantle which is just below the lithosphere & Asthenosphere, but above the core is called Mesosphere.

03 → CORE → It is the innermost layer surrounding the earth's centre. The core is separated from the mantle by Gutenberg's discontinuity ^{at the depth of 2900 km.} It is composed of mainly Iron (Fe) & Nickel (Ni). The core constitute nearly 15% of the Earth's volume & 32.5% of Earth's mass. The density of material at the mantle-core boundary is around 5 g/cm^3 and suddenly there is pronounced change into 10 g/cm^3 along the Gutenberg discontinuity. This sudden change in density is indicated by sudden increase

the in_n velocity of P waves. The density further increases at the centre of the Earth at 6300 km, which is around 13 g/cm^3 . It, thus appears that the density of the core is more than twice the density of the Mantle. The core is further divided into two sub-zones \rightarrow The Inner core & the outer core. The outer core is in the molten/liquid state while the inner core is in solid/plastic state. That's why the S-waves are disappears in the outer core. The discontinuity between the upper core & the lower core is called as Lehmann discontinuity. "Barysphere" is sometimes used to refer the core of the Earth.

