GEOGRAPHY

Earth's Layers-

Based on GROUP-IV Examination syllabus -prepared by G.SRIRAM

NOTE: Dear kalam achievers kindly read at lest 4 to 5 times you can easily understand..

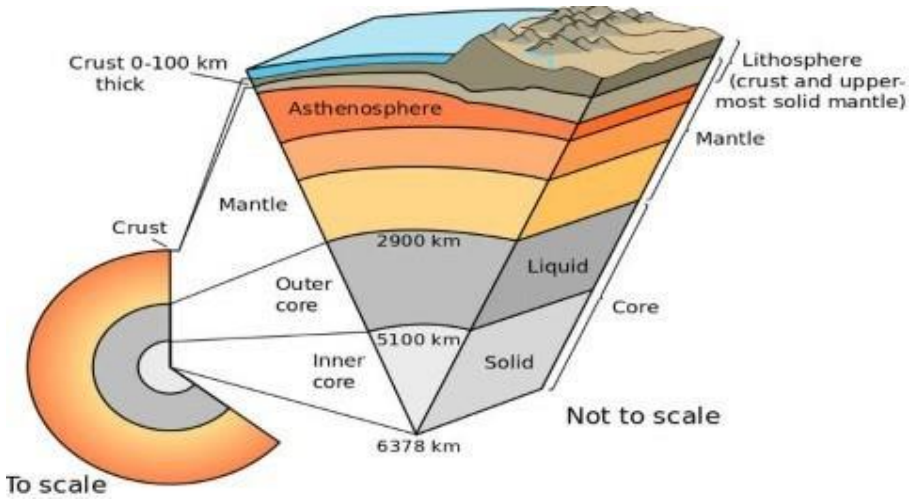
Earth's Layers

- Earth's layers are identified by studying various direct and indirect sources The structure of the earth's interior is made up of several **concentric layers**.
- Broadly three layers can be identified—**crust, mantle** and the **core**.

Watch video for better and quick understanding

Earth's Layers based on chemical properties

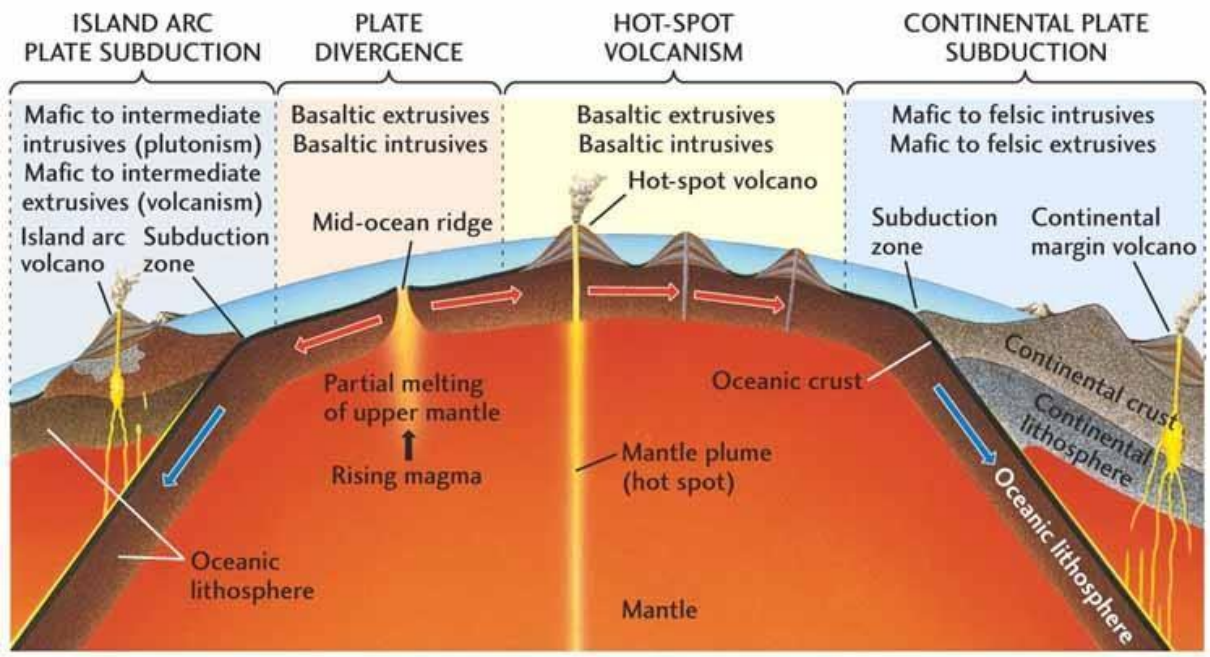
1. **crust,**
2. **mantle, and**
3. **Core.**



Earth's Layers – The Crust

- Crust is the outer thin layer with a total thickness normally between **30-50 km**.
- The thickness of the crust varies under the oceanic and continental areas.
- Oceanic crust is **thinner (5-30 km thick)** as compared to the continental crust **(50-70 km thick).**
- The continental crust is thicker in the areas of major mountain systems. It is as much as **70 -100 km thick in the Himalayan region.**

- It forms **5-1.0 per cen**t of the earth's volume.
- **Mohorovicic (Moho) discontinuity** forms the boundary **between crust and asthenosphere** [**asthenosphere is a part of mantle**].
- The outer covering of the crust is of **sedimentary material (granitic rocks)** and below that lie crystalline, igneous and metamorphic rocks which are **acidic** in nature.
- The lower layer of the crust consists of **basaltic and ultra-basic rocks.**
- The continents are composed of lighter silicates—silica + aluminium (also called **'sial'**) while the oceans have the heavier silicates—silica + magnesium (also called '**sima'**).



Earth's Layers – Mantle

- The mantle extends from **Moho's discontinuity** (35 km) to a depth of **2,900 km (**Moho-Discontinuity to the **outer core).**
- The crust and the uppermost part of the mantle are called **lithosphere.** Its thickness ranges from **10-200 km.**
- The lower mantle extends beyond the asthenosphere. It is in **solid state.**
- The density of mantle varies between 2.9 and 3.3.
- The density ranges from 3.3 to 5.7 in the lower part.
- It is composed of solid rock and magma.
- It forms **83 per cent** of the earth's volume.

- The outer layer of the mantle is partly **simatic** while the inner layer is composed of wholly **simatic ultra-basic rocks**.

Earth's Layers – Asthenosphere

- The **upper portion of the mantle** is called asthenosphere.
- The word astheno means weak.
- It is considered to be extending up to 400 km.
- It is the **main source of magma** that finds its way to the surface during volcanic eruptions. It has a density higher than the crust's.

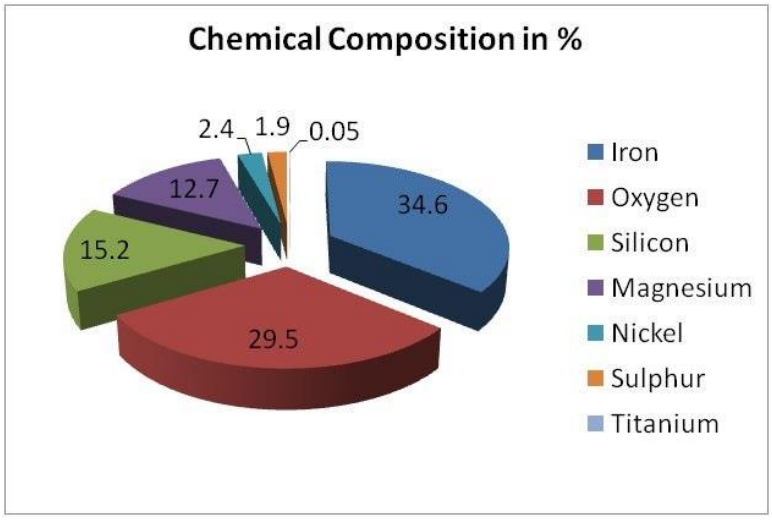
Earth's Layers – Core

- Lies between **2900 km and 6400 km** below the earth's surface.
- Accounts for **16 per cent** of the earth's volume.
- Core has the heaviest mineral materials of highest density.
- It is composed of **nickel and iron [nife].**
- The **outer core is liquid** while the **inner core is solid.**
- A zone of mixed heavy metals + silicates separates the core from outer layers.

Earth's Layers – Seismic Discontinuities

1. Mohorovicic Discontinuity (Moho) – separates the crust from the mantle, its average depth being about 35 km.
2. A soft asthenosphere (highly viscous, mechanically weak and ductile). It's a part of mantle.
3. Gutenberg Discontinuity – lies between the **mantle and the outer core**. Below 2900 km from earth's surface.

Earth's Chemical Composition



Composition of Earth's Crust

Table 5.1 : The Major Elements of the Earth's Crust

Sl. No.	*Elements*	*By Weight(%)*
1.	Oxygen	46.60
2.	Silicon	27.72
3.	Aluminium	8.13
4.	Iron	5.00
5.	Calcium	3.63
6.	Sodium	2.83
7.	Potassium	2.59
8.	Magnesium	2.09
9.	Others	1.41