Internal Structure of the Earth

The internal structure of the Earth refers to the arrangement and organization of the materials found beneath the Earth's surface. It explains how the Earth is made up of distinct layers, each with different physical and chemical characteristics, extending from the surface down to the centre of the Earth.

Although the interior of the Earth cannot be observed directly, scientists understand its structure through indirect evidence such as seismic waves, changes in temperature, pressure, and density, and the behaviour of rocks under extreme conditions. These studies show that the Earth is not uniform inside, but is layered due to differences in chemical composition (depth) and physical behaviour (mechanical properties).

Internal Division of The Earth Based on Chemical Composition (Depth)

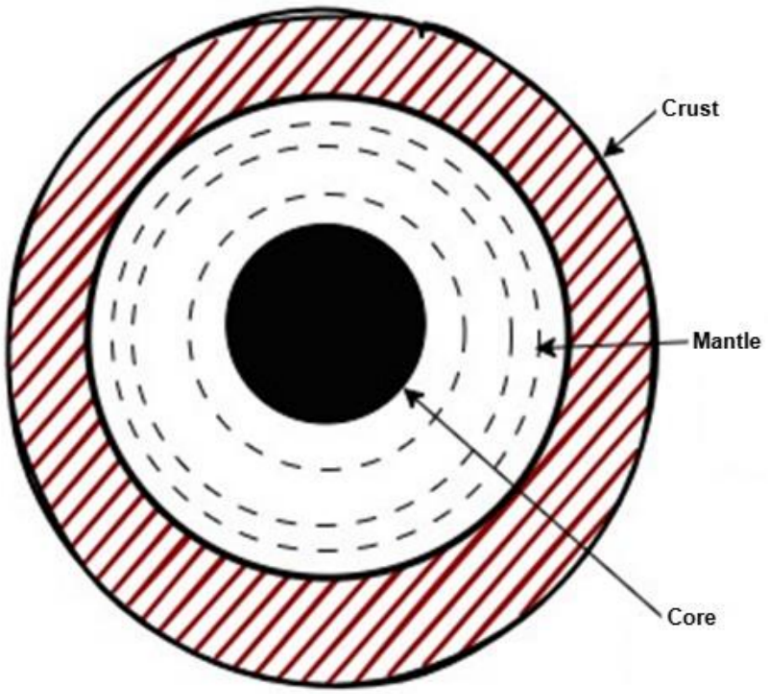
Based on chemical composition, the Earth is internally divided into three main layers:

Crust: The outermost, thinnest and shallow layer of the earth made up of lighter rocks rich in silica and aluminium. The crust contains most of the Earth's minerals, soils, and fossil fuels. It is broken into large rigid sections known as tectonic plates, which move slowly over the semi-molten mantle.

Mantle: Lies beneath the crust and is the thickest layer of the Earth composed of heavier minerals rich in magnesium and iron.

Core: The deepest layer made up of very heavy metals, mainly iron and nickel.

Illustration of Earth's Internal Structure Based on Chemical Properties (Depth)



Internal Division of The Earth Based on Physical Behaviour (Mechanical Properties)

Based on physical behaviour, the crust, mantle, and core are further divided as follows:

The Crust

Continental crust: The part of the Earth's crust on which the continents are found. It is generally thicker and less dense than the oceanic crust.
Oceanic crust: The part of the Earth's crust that forms the floors of the oceans. It is thinner but denser than the continental crust.

The Mantle:

Lithosphere: The rigid outer layer of the Earth. It consists of the crust and the uppermost part of the mantle. It is broken into tectonic plates that move slowly over the asthenosphere.
Asthenosphere: Semi-molten, soft layer found beneath the lithosphere within the upper mantle. It allows the movement of tectonic plates, leading to earthquakes, volcanic activity, and mountain building.
Mesosphere: Located in the lower mantle below the asthenosphere and above the core. It is solid and very dense, and its rocks can flow slowly under high pressure and temperature.

The Core:

Outer Core: Is located beneath the mantle and surrounds the inner core. It is composed mainly of molten iron and nickel and exists in a liquid state due to extremely high temperatures. **Inner Core:** Forms the centre of the Earth and is the hottest and most dense part of the planet. It is composed mainly of iron and nickel but remains solid because the pressure at this depth is extremely high, preventing the metals from melting.

Illustration of Earth's Internal Structure Based on Physical Behaviour (Mechanical Properties)