

Chapter 2: Inside the Restless Earth

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Divisions

Core

- Huge in size
- Radius of 3500 km
- Inner: solid
- Outer: liquid
- Very hot temp.:
 - Inner: 4700 -> 6700 C
 - Outer: 3700 -> 4700 C
- Consists of:
 - iron
 - nickel

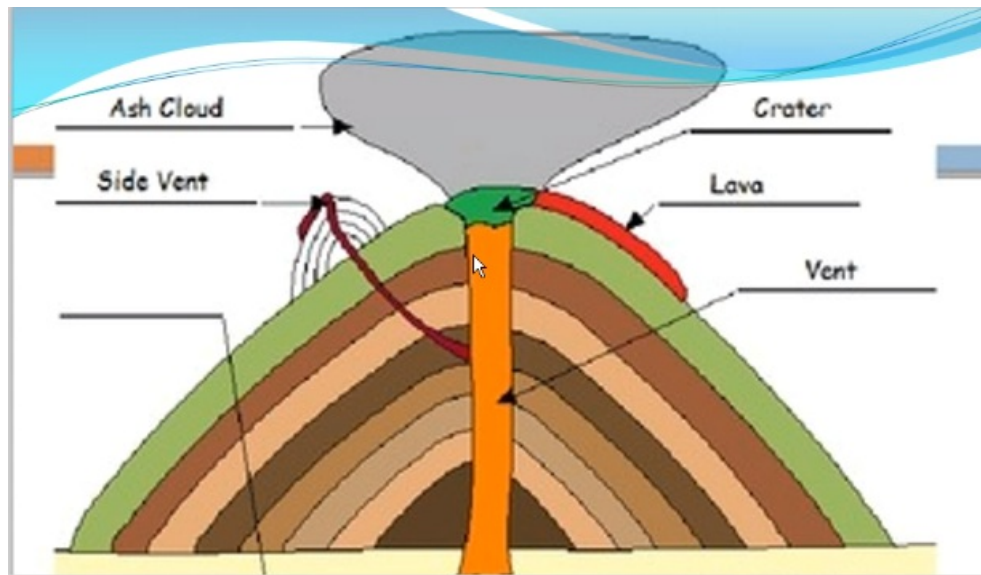
Mantle

- 2900 km thick
- Constant movement
- Upper aka Asthenosphere
- Temp.:
 - Lower: 2800 C
 - Upper: 1800 C
- Consists of:
 - iron
 - magnesium

Crust

- Thinnest & Outermost
- 2 types:
 - Continental:
 - Below landforms
 - 40km -> 100km
 - 2 layers:
 - Lower: made of sima and basaltic rock
 - Upper: made of sial (Athenosphere)
 - Oceanic:
 - Below oceans
 - 6km thick
- 1% of Earth's mass

Lava



Lava

- **Lava:** Molten rock that has reached the surface
- **Magma:** Molten rock stored in the Earth's crust

Rocks

- Parts of crust
- Formed by composition of solid aggregates of minerals in the solid state
- **Minerals:**
 - Silicon
 - Aluminium
 - Iron
 - Sodium
 - Calcium
 - Potassium
- Divided into three types:

Igneous Rocks

- Ignis = 'fire' [latin]
- Cooling and hardening of magma/lava
- aka parent rocks
- Frequently have crystals making them look glassy
- Metals obtained from them: copper, tin
- Also contain: mica, basalt, granite, feldspar
- Devil's Tower [USA] formed by Igneous Intrusion
- 2 types:
 - Intrusive rocks:
 - Slow cooling under ground

- Cools over 100/1000 yrs & develops large crystals
- E.g.:
 - Granite
 - Gabbro: used in making tombstones
 - Diorite
 - Peridotite
- Extrusive rocks:
 - Rapid cooling of magma on surface
 - E.g.:
 - Pumice
 - Basalt: dark grey, black
 - Trachyte
 - Andesite
 - Rhyolite

Sedimentary Rocks

- Formed from weathering of pre-existing rocks
- Formed from tiny pieces of rocks, dead animals, plant & micro-orgs
- Takes 1000s of years to form
- Formation of sedimentary rocks:
 1. Rivers carry stones, gravel, ...
 2. Sediment settles at bottom of rivers & lakes: Sedimentation
 3. Layers keep on depositing
 4. Pressure falls on the lower layers: Compaction
 5. Salt in layer causes cementing
- E.g.:
 - Sandstone (Red Fort)
 - Shale (Tiles)
 - Limestone
 - Conglomerate
 - Mudstone

Metamorphic Rocks

- Compression of igneous & sedimentary under layers of soil
- E.g.: Slate, Schist, Quartzite, Marble, Gneiss
- Heat & pressure on Sedimentary / Igneous
- Limestone -> Marble
- Granite -> Gneiss
- Heat from magma & pressure from rocks above
- Shale -> Slate
- Sandstone -> Quartzite
- Slate & Quartzite used in flooring and house bases
- Metamorphosis = Process
- Classified into 2 types:

- Low grade
- High grade

Rock Cycle

- (Igneous -> Sediment) -> Metamorphic = Rock Cycle
- Igneous -> Sediment = Weathering
- Igneous, Sediment -> Metamorphic = Heat & pressure
- Metamorphic -> Igneous = Melting
- Metamorphic -> Sediment = Weathering, Erosion