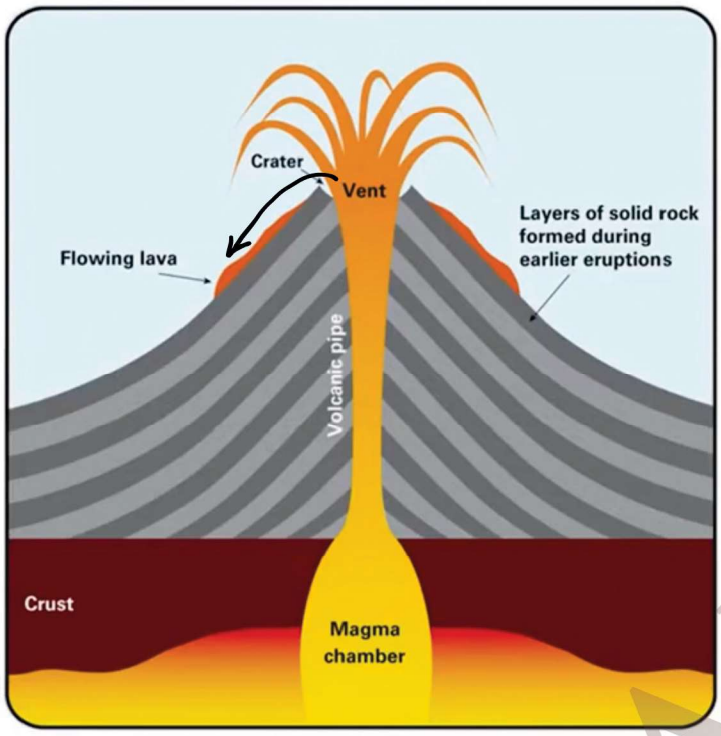
ROCKS, CONTINENT AND OCEANS

Petrology: Study of rocks

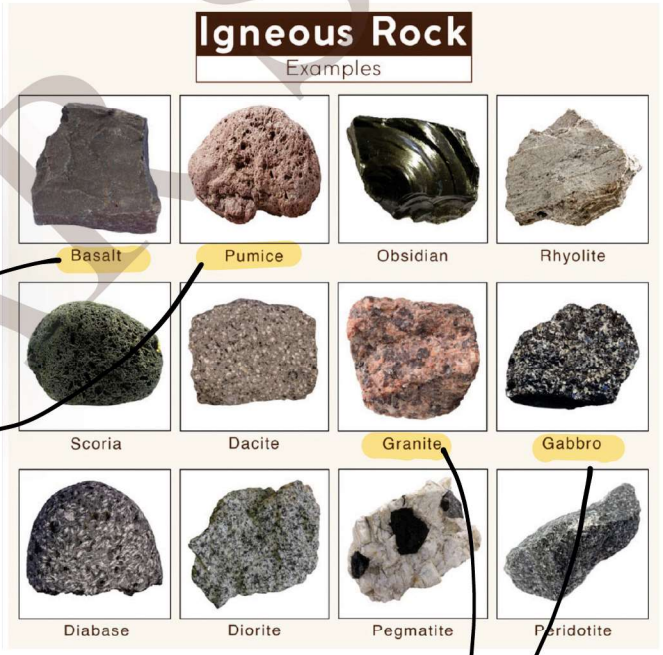


How are rocks formed?

Igneous Rocks: formed when magma cools and solidifies

Types:

1. Intrusive: solidifies inside
2. Extrusive: solidifies outside



Rock

Exogenous agents act upon eg: wind, water

Extrusive igneous rock

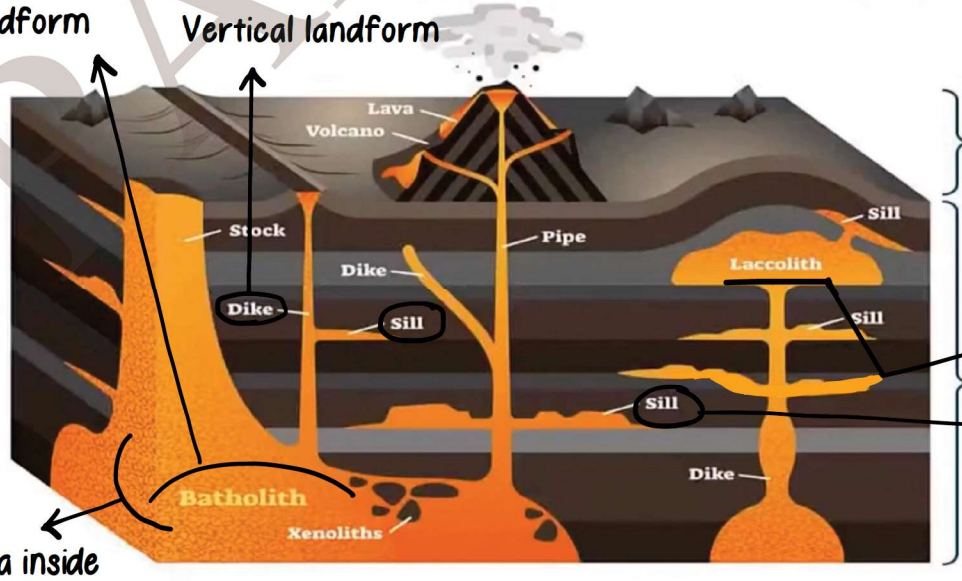
Intrusive igneous rock/plutonic rocks

- Granite: Continental crust
- Basalt: Oceanic crust

PLUTONIC BODIES

Domed shaped landform

Vertical landform



Phacolith

Horizontal Landform

Magma inside

Sedimentary Rock: Sediments are broken, transported, and deposited

- They exists in layers/strata
- In sedimentary compaction takes place – Lithifaction
- Fossils are found in it

Types:

1. Formed mechanically, eg: Sandstone, limestone and shale
2. Formed organically, eg: chalk, limestone, coal
3. Formed chemically, eg: Limestone, halite

Metamorphic Rock: These rocks are formed by recrystallisation and reorganisation of materials within the original rocks

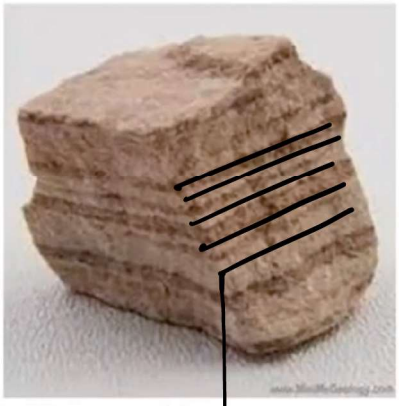
Igneous + Sedimentray → Metamorphic

↓

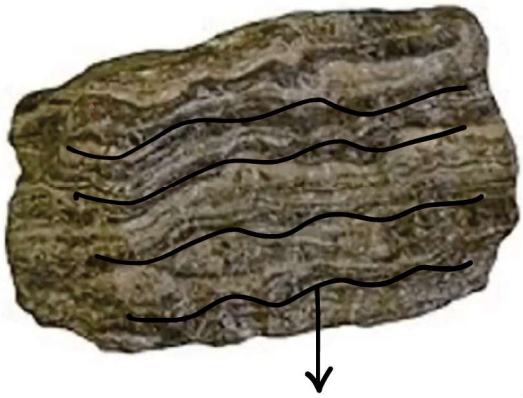
Pressure
Volume
Temperature
} change in forms → Metamorphosis

Types:

1. Thermal Metamorphism: metamorphic rocks formed due to a sudden temperature change
2. Dynamic Metamorphism: metamorphic rocks formed without any chemical change



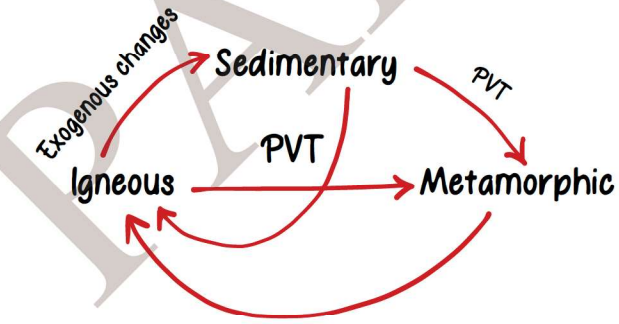
Alternate dark and light bands called **banding**



Lines formed called **Lineation**

- Granite → Gneiss (PVT changes) → Metamorphic
- Shale → Slate → Metamorphic
- Sandstone → Quartzite → Metamorphic
- Limestone → Marble / Schist / Amphibolite → Metamorphic

Rock Cycle



Volcano

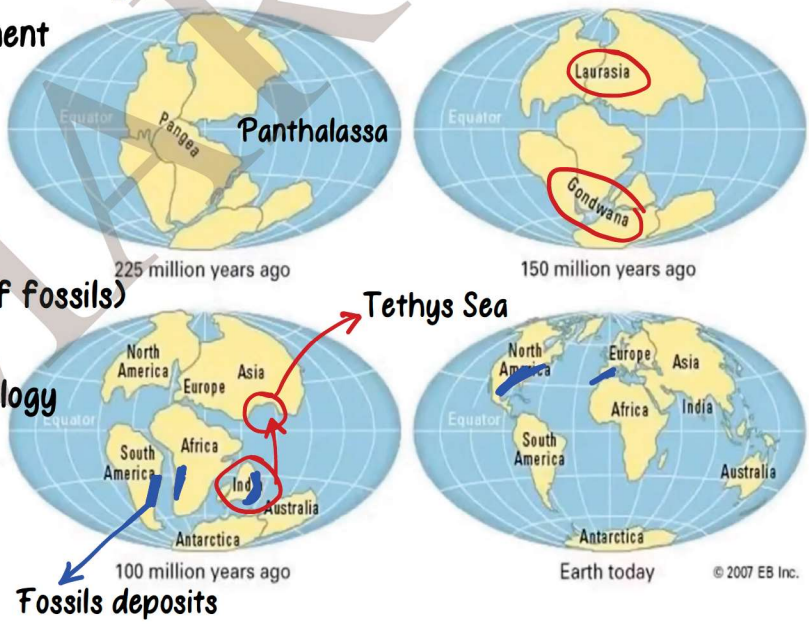
Types:

1. Cinder
2. Composite: most viscous lava
3. Shield: low viscosity lava
4. Caldera: most explosive lava, collapses on itself

Continents and Oceans

- Alfred Wegener: Gave Continental Drift Theory, 1912

All of the modern-day continents had previously been clumped together in a supercontinent called Pangaea and the water body is called Panthalassa



→ Evidences:

- Jig Saw fit
- Fossils deposits: Palaeontology (study of fossils)
- Placer deposits

Study of rock: Petrology

Types of rocks

Soft — eg: Talc

Hard — eg: Diamond

Fossils deposits

- Continental drift due to (as assumed by Alfred Wegener)
  1. Tidal force
  2. Polar fleeing force

But it occurs due to development of convection cells

Convection cells

Due to

Residual heat — Radioactive decay

Two main sources of heat within the Earth

- Decreasing order of Continents and Oceans

Area wise	Population basis
Asia	Asia
Africa	Africa
North America	Europe
South America	North America
Antarctica	South America
Europe	Australia
Australia	Antarctica

Mariana Trench deepest point: Challenger deep

deepest ocean

Oceans Order

P: Pacific Ocean

A: Atlantic Ocean (S-shape)

I: Indian Ocean

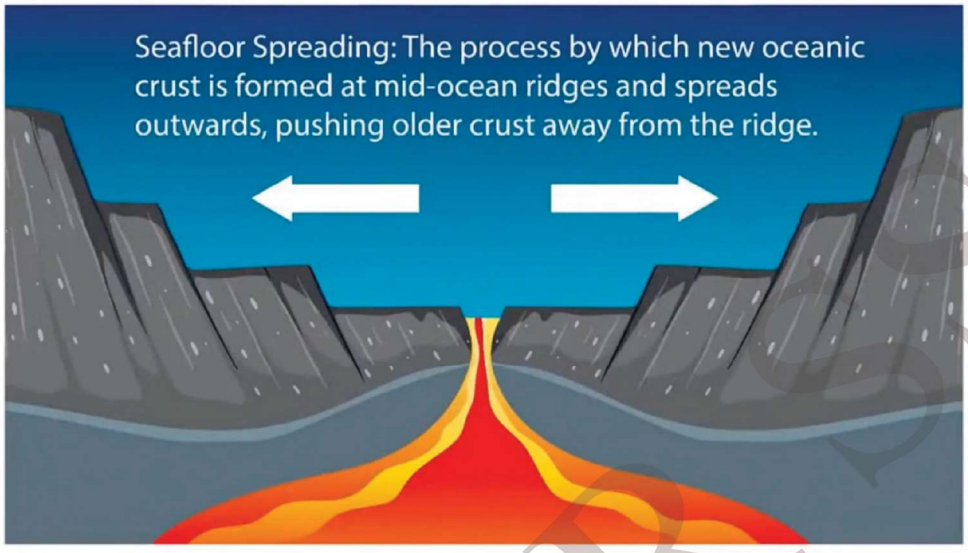
S: Southern (Atlantic)

A: Arctic

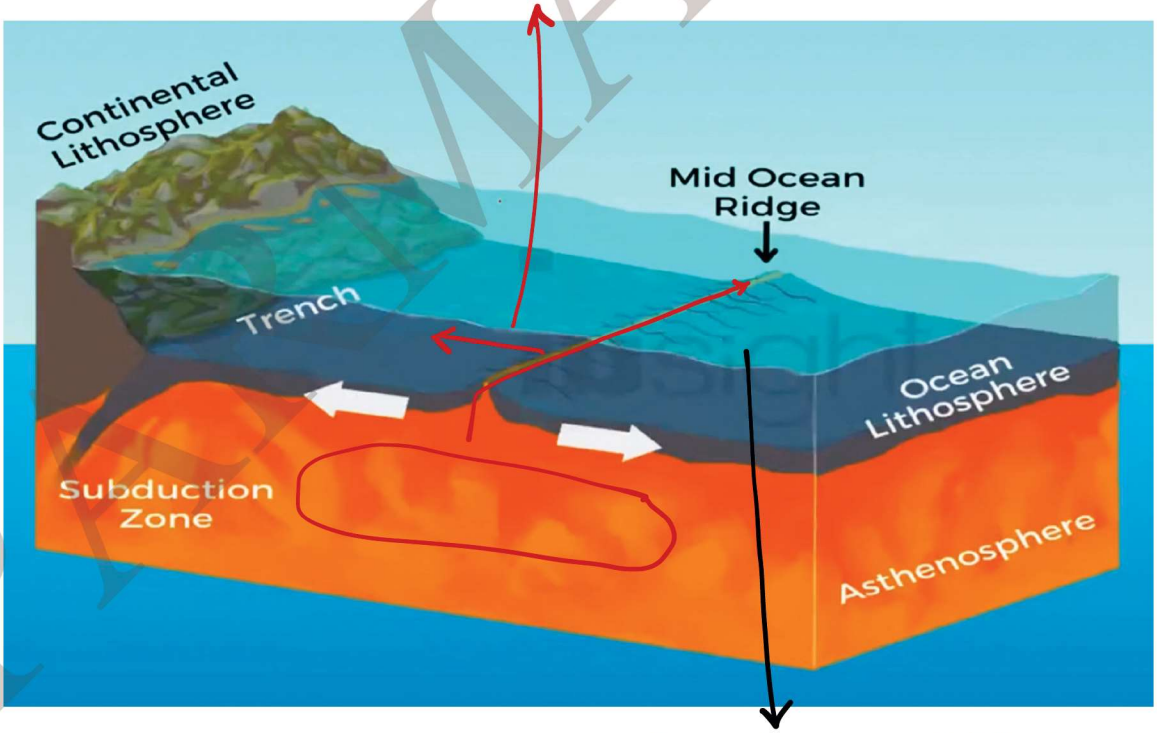
Busiest ocean

Sargasso Sea (brown algae Sargassum is seen here) - borderless sea

The Process of Seafloor Spreading



The age of oceanic rocks increases as you move away from the mid-ocean ridge



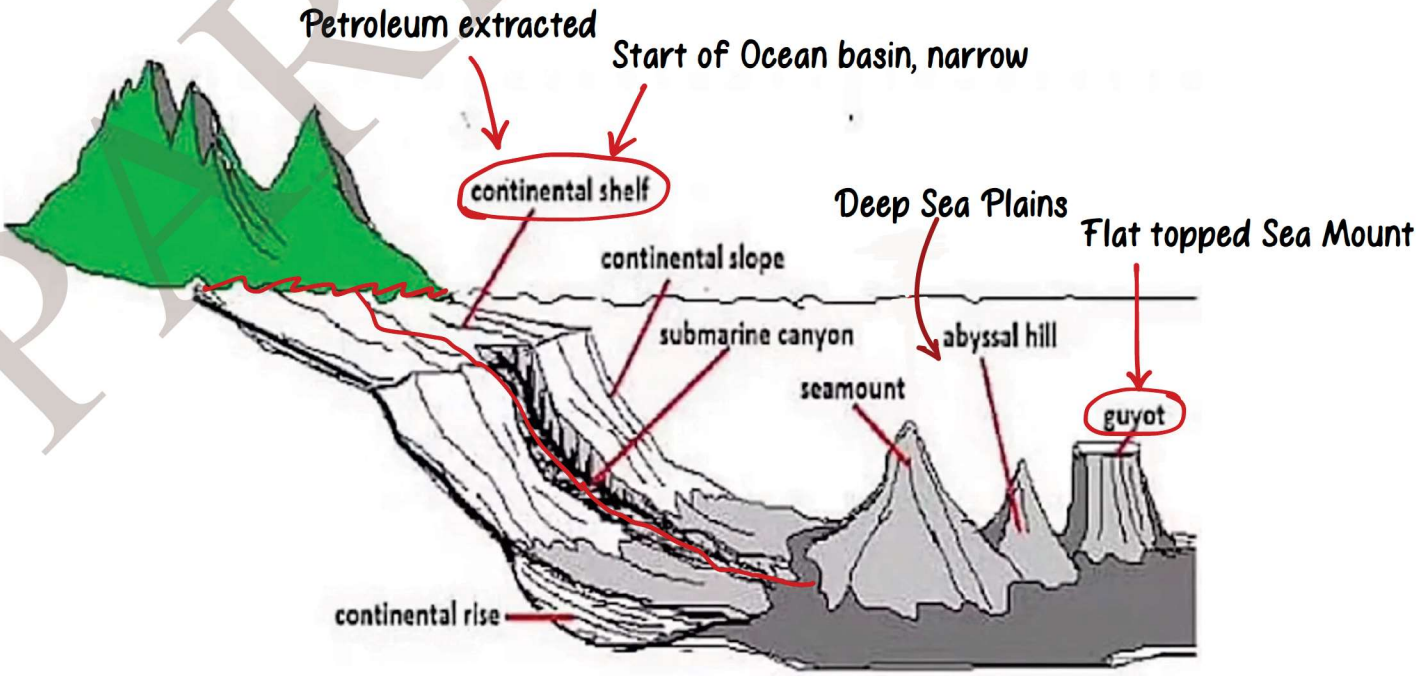
Oceans has more relief features than continents (more diversity)

- Harry H. Hess gave seafloor spreading theory, 1962

created due to divergent plate boundary

Mid-Atlantic Ridge

Longest and largest landform on Earth

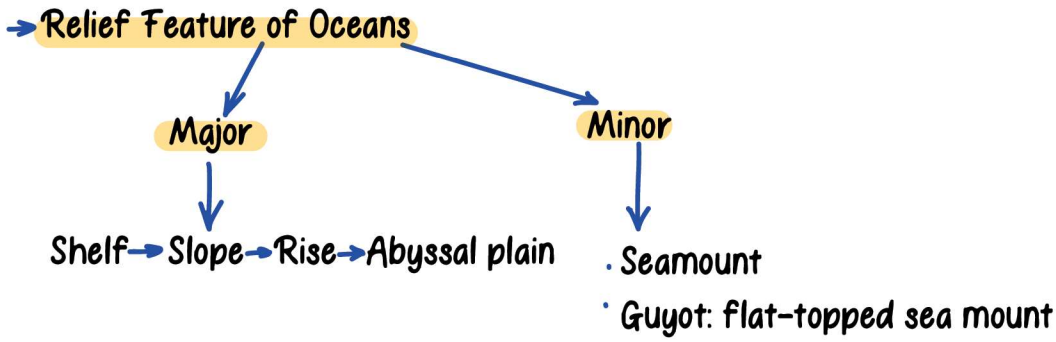


- Minor relief feature: Atoll, sea mount, guyot

Corals: they are sea organisms, known as Rainforest of Sea

- Exists in symbiotic relationship with Zooxanthellae algae
  - Makes food for corals
  - Secretes $CaCO_3$ that provides protection to Zooxanthellae algae
- Corals exists in colony
- Favourable conditions:
  1. Saline water (cannot survive in fresh water)
  2. Sunlight
  3. Clear water
  4. Temperature: Moderate temperature 30–35°C
- Barrier Reef: Great Barrier Reef in Australia (largest)

- Coral bleaching: when water is too warm, corals will expel the algae (Zooxanthellae) living in their tissues causing the corals to turn completely white
  - due to climate change


Relief Feature of Oceans
Major
Minor
Shelf → Slope → Rise → Abyssal plain
Seamount
Guyot: flat-topped sea mount