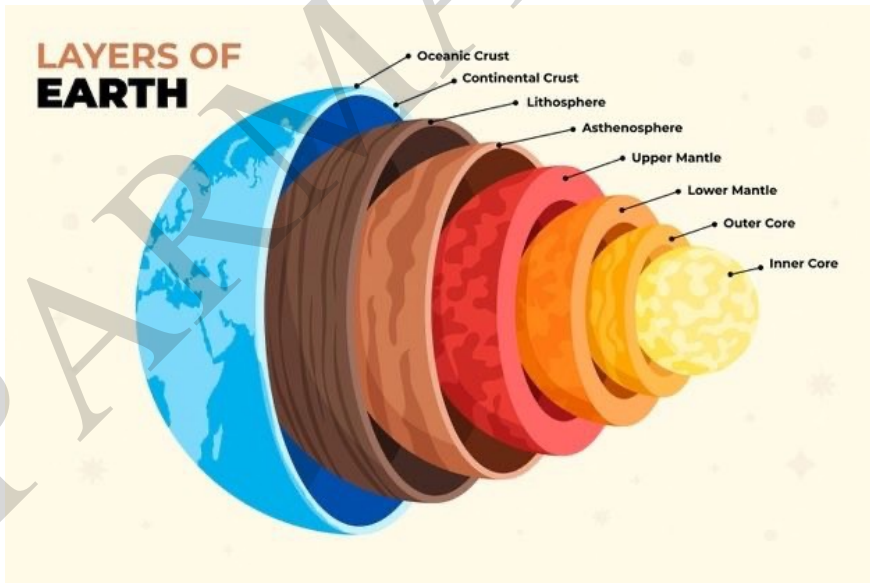


Earth's Interior & Plate Tectonic





Phase - 1

- Origin of Earth(पृथ्वी की उत्पत्ति)
- Plate tectonic theory (प्लेट टेक्टोनिक सिद्धांत)



Phase - 2

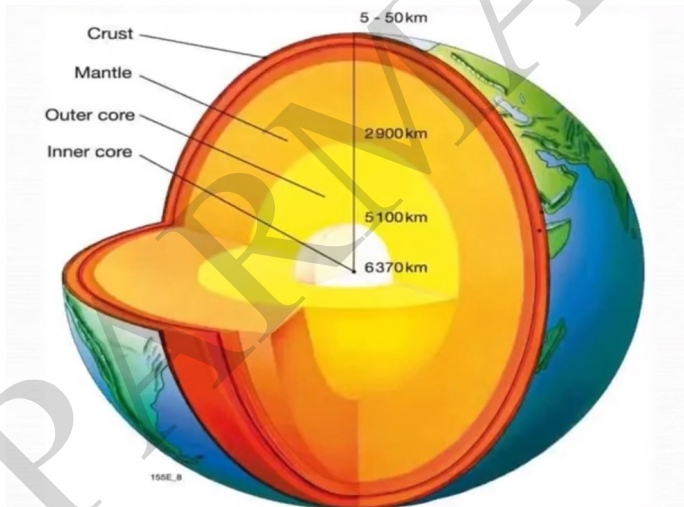
- Interior of Earth(पृथ्वी का आंतरिक भाग)
- Earthquake & Volcanoes(भूकंप और ज्वालामुखी)



Phase - 3

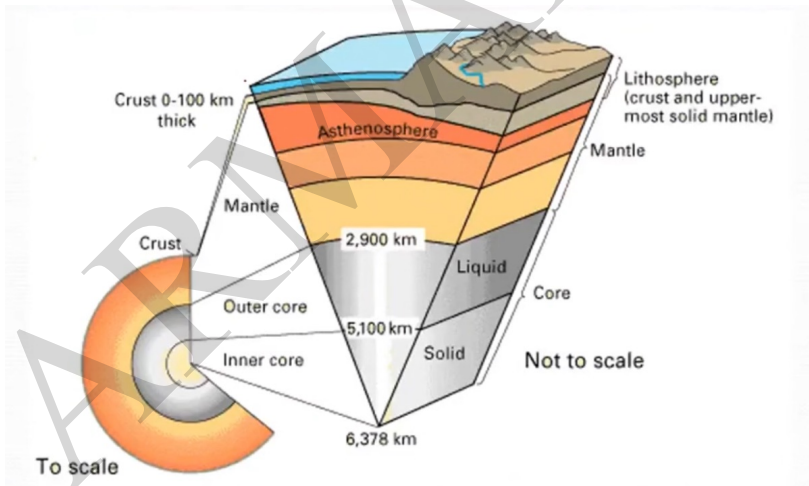
- PLATE MOVEMENTS

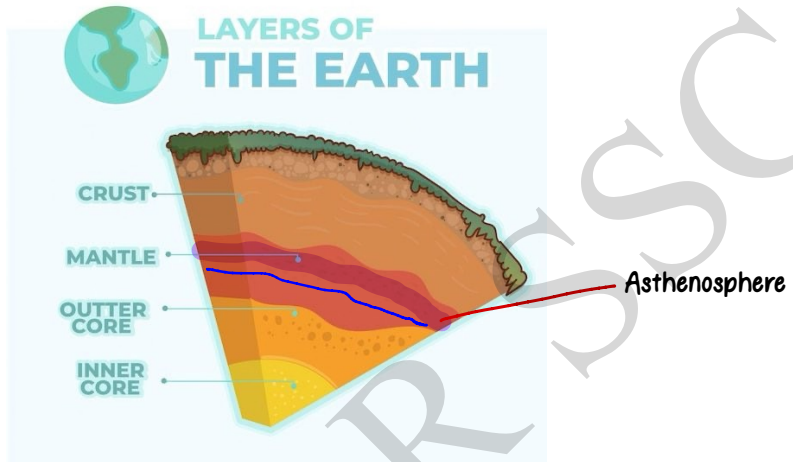
Earth's Interior



Four method's to know Earth's interior:

1. Temperature - indirect source
2. Volcanoes and rock - direct source
3. Meteorites - indirect source
4. Earthquakes - indirect source





Crust: made of Silica and Aluminium layer (SiAl)

- Thickness: 5-70 km

Two divisions:

1. Continental Crust:

- land part of crust
- 30 km (thick/lighter)
- made of Granitic rock

2. Oceanic Crust:

- water part of crust
- 5 km (thin/denser)
- made of Basaltic rock

Composition of Earth's crust:

- O → 46.4%
- Si → 28%
- Al → 8% (most abundant metal in crust)
- Fe → 5% (2nd most abundant)

Mantle: made of Silica and Magnesium (SiMa)

- Thickness: 2900 km
- Top layer: Solid form

Two divisions:

1. Upper Mantle
2. Lower Mantle

- Asthenosphere: semi-molten form (plastic form)

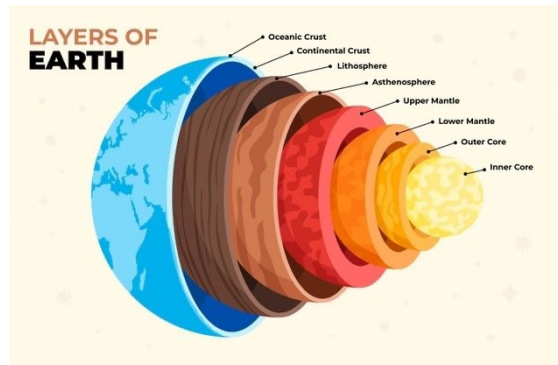
Core: made of Nickel and Iron (NiFe)

Two divisions:

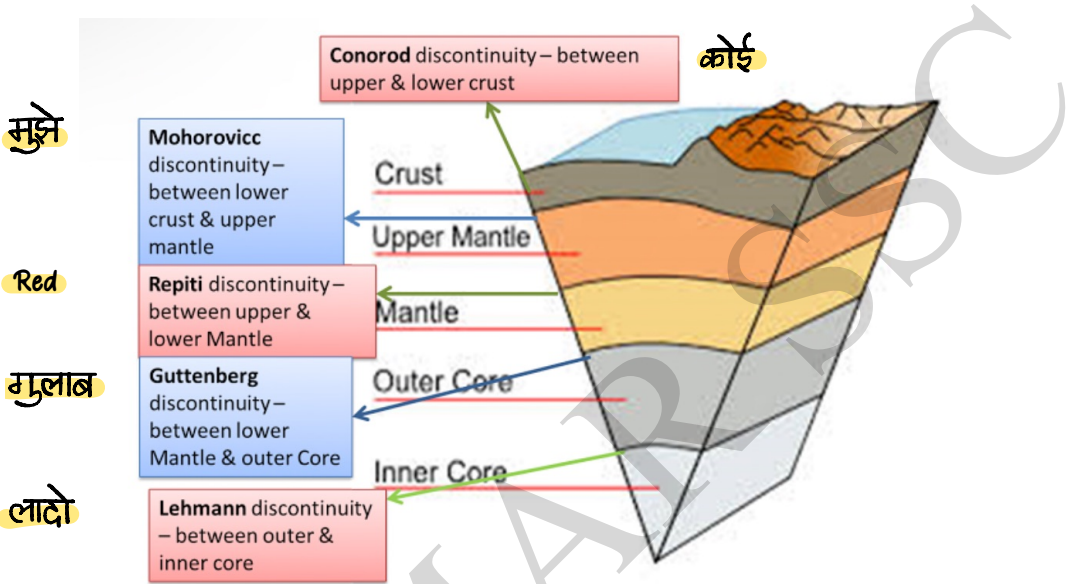
1. Inner Core: Solid form - 2200 km
2. Outer Core: liquid form (shows magnetic properties) - 1300 km

	<u>Crust</u>	<u>Mantle</u>	<u>Core</u>
<u>By Volume</u>	1%	84%	15%
<u>By Mass</u>	1%	68%	31%

- Lithosphere: Crust + Upper solid part of Mantle - thickness: 10-200 km
- Asthenosphere is not part of Lithosphere



Earth's Discontinuity

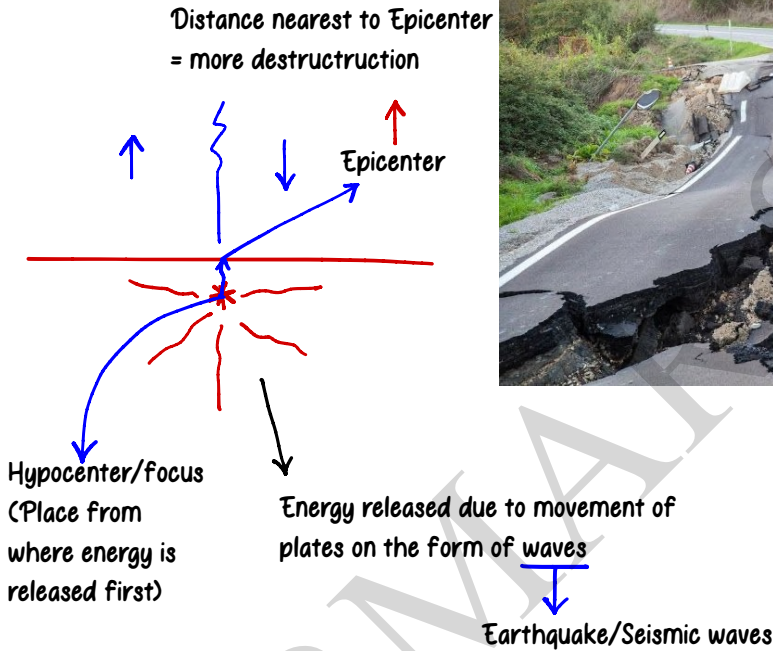


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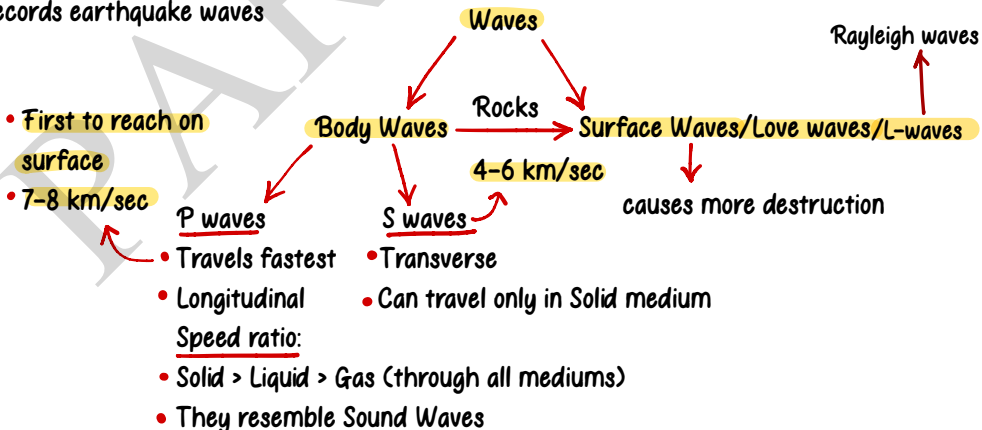
S. No	Discontinuity	Layers	Depth
1.	Conrad	Outer and Inner Crust	45 km
2.	Moho	Crust and Mantle Inner Crust and Outer Mantle	100 km
3.	Repiti	Outer Mantle and Inner Mantle	700 km
4.	Guttenberg-Weichart	Mantle and Core Inner Mantle and Outer Core	2900 km
5.	Lehmann	Outer Core and Inner Core	5200 km

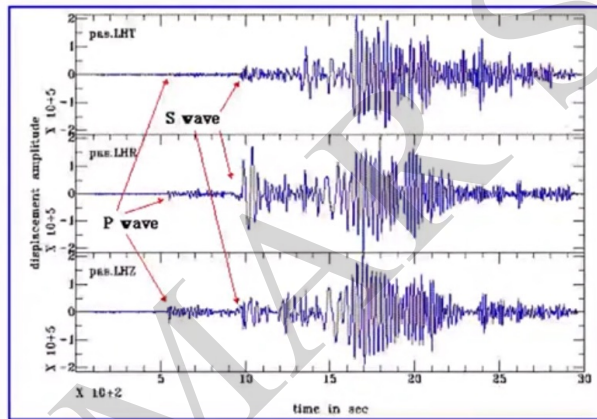
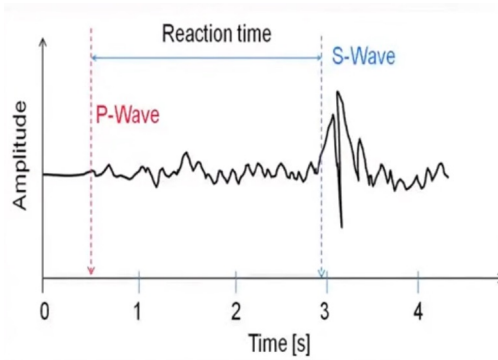
Earthquake

- An Earthquake is intense shaking of Earth's surface, which causes shifting of Earth's plate



- **Seismograph:** an instrument that records earthquake waves





S waves



- creates Crest and Trough

P waves

- creates Compression and Rarefaction
 - causes stretching and squeezing
-

Scales to measure Earthquake

EARTHQUAKE MAGNITUDE SCALE



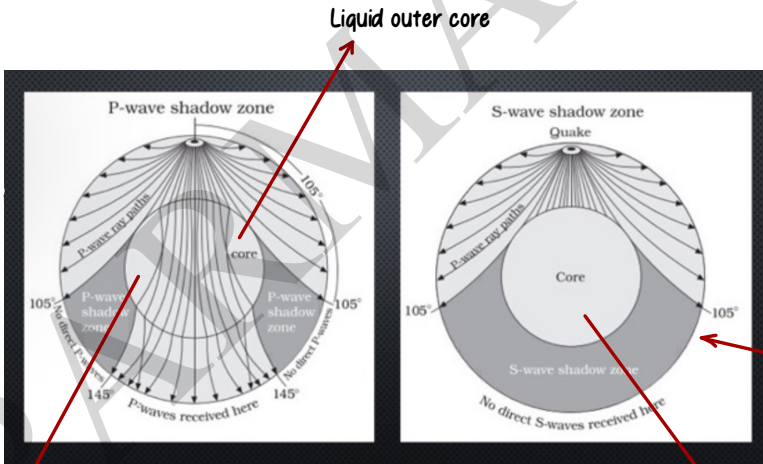
Richter Scale

- Instrument to measure **magnitude of Earthquake**
- **Magnitude: 0-10**
- It is a **limitless scale**

Mercalli Scale

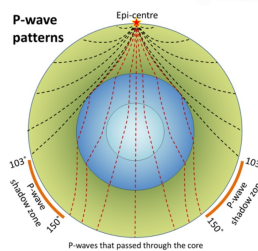
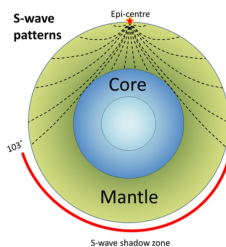
- Instrument to measure **intensity of Earthquake**
- **intensity: 1-12**

Shadow zone of waves



Large shadow zone
 • **40% of Earth's surface (not recorded)**

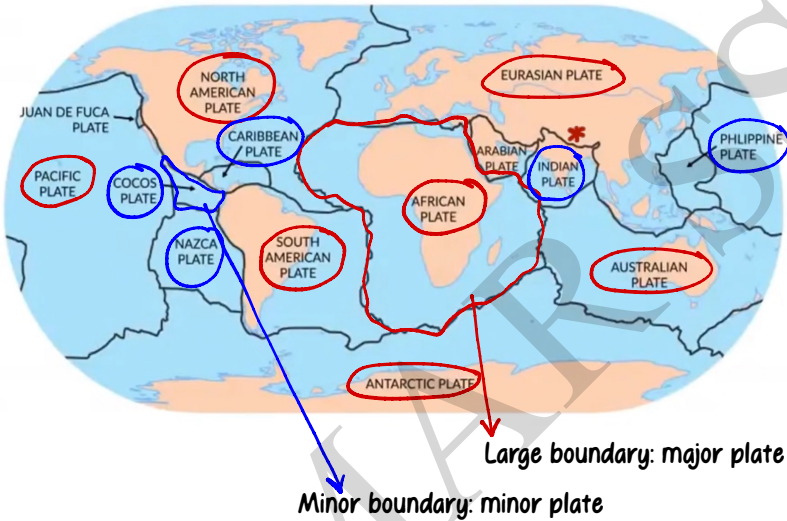
Slow speed



Liquid outer core

Tectonic plates

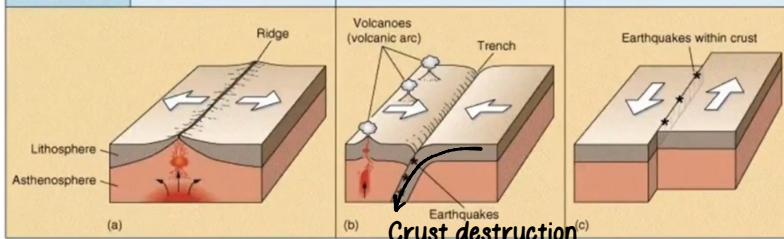
- Lithosphere makes plates comprising Crust and upper solid part of Mantle
- 7 Major + few minor plates



- Major plates marked in red
- Minor plates marked in blue

Different types of plate boundaries

Type of Margin	Divergent	Convergent	Transform
Motion	Spreading	Subduction	Lateral sliding
Effect	Constructive (oceanic lithosphere created)	Destructive (oceanic lithosphere destroyed)	Conservative (lithosphere neither created or destroyed)
Topography	Ridge/Rift	Trench	No major effect
Volcanic activity?	Yes	Yes	No



(a) Ridge
Lithosphere
Asthenosphere

(b) Volcanoes (volcanic arc)
Trench
Earthquakes
Crust destruction

(c) Earthquakes within crust

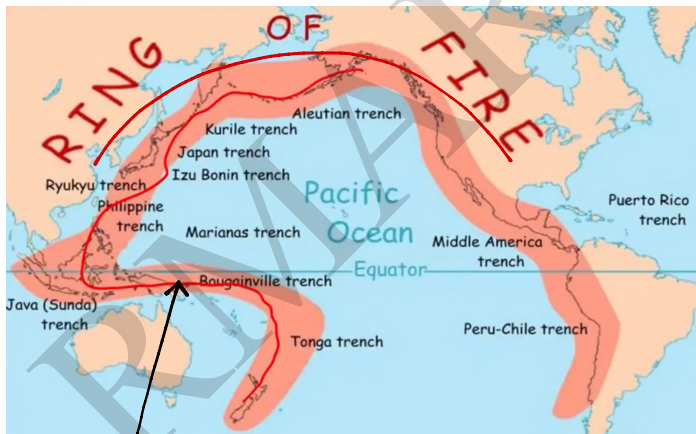
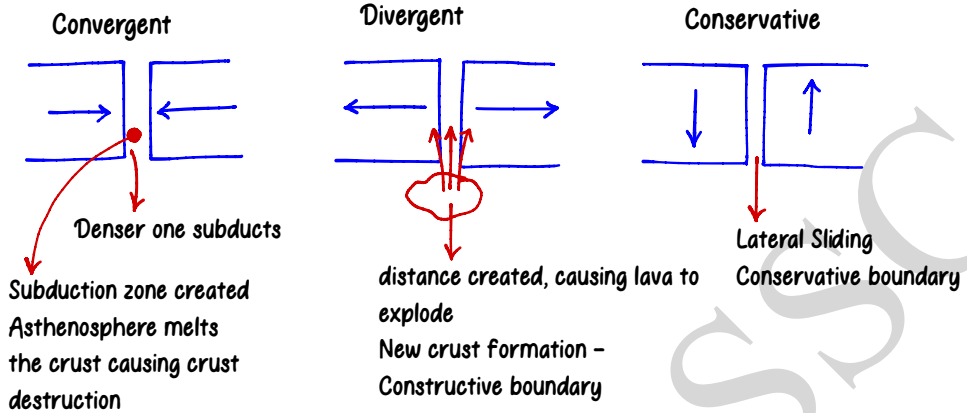


Plate boundary created,
these places are called-
**Ring of Fire in Pacific
Ocean**

Force behind plate movement:

- Convection occurs in the asthenosphere

↳ The heat from the earth's interior causes currents of hot rising magma and cooler sinking magma to flow, moving the plates of the crust along with them

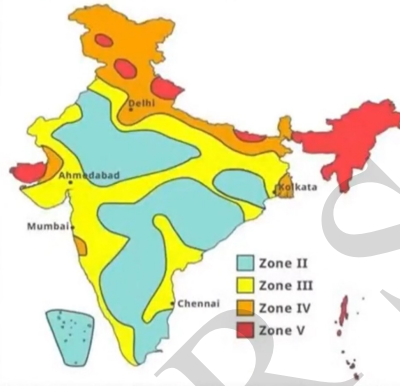
Seismic Zones in India-

Seismic Zone
Map of India: -2002

About **52 percent** of the land area of India is liable to seismic hazard damage

Zone	Intensity
Zone V	Very High Risk Zone Area liable to shaking Intensity IX (and above)
Zone IV	High Risk Zone Intensity VIII
Zone III	Moderate Risk Zone Intensity VII
Zone II	Low Risk Zone VI (and lower)

Seismic zones in India



PARMARSSC