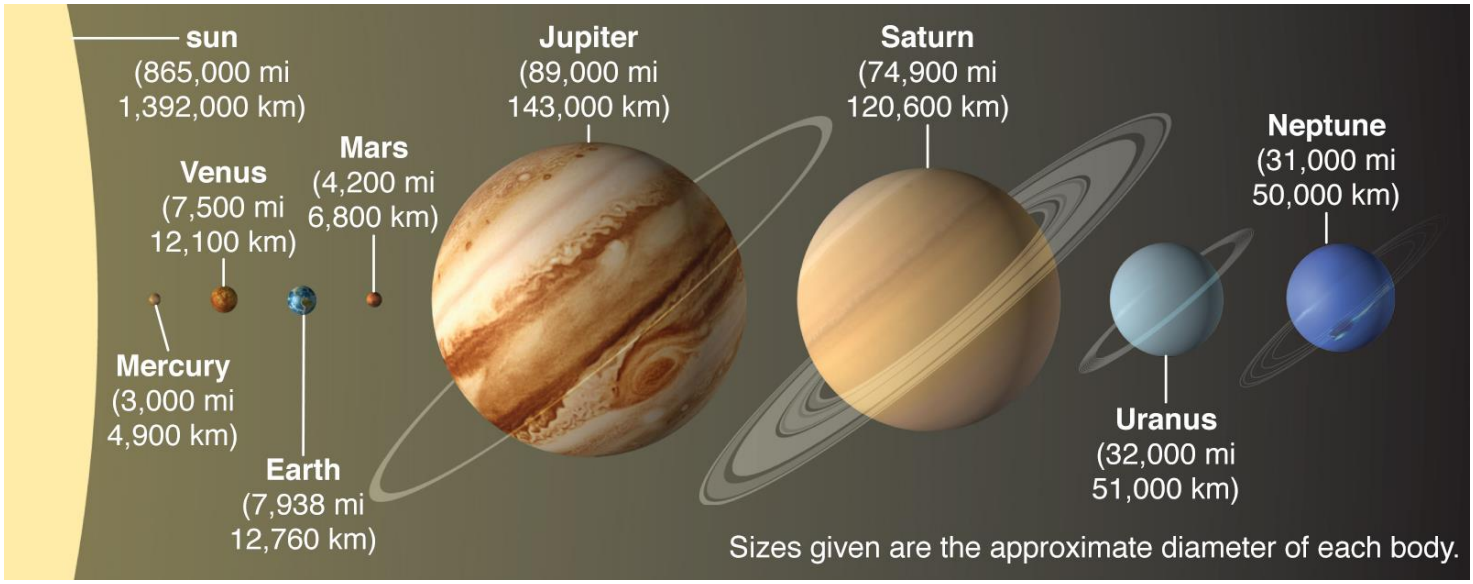
[Ch. 01] Astronomy.

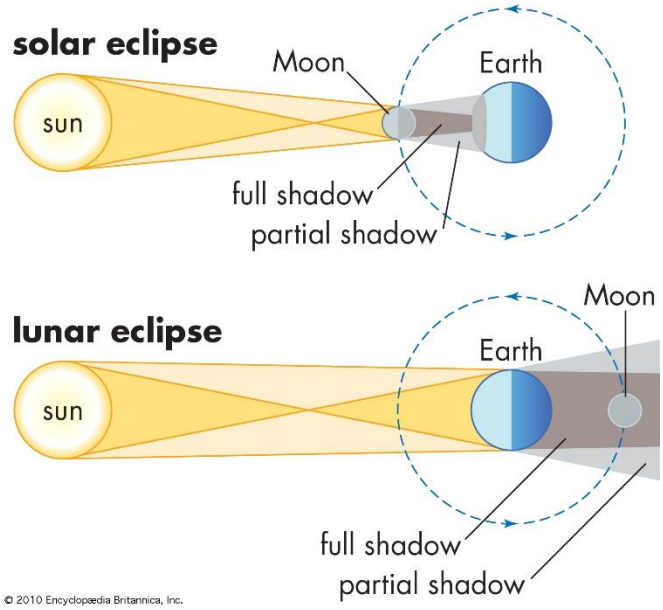
- ❖ Star:
  - ○ Concept:
  - ○ Life Cycle of Star
  - ○ Chandrasekhar Limit
  - ○ Colour of Star
- ❖ Universe:
  - ○ Super Cluster: (group of 3 Galaxy)
    - ▪ Galaxies (3):
      - Milky-way Galaxy
        - ○ Sun
        - ○ Proxima Centauri
        - ○ Sirius (Dog Star): Brightest Star
      - Andromeda Galaxy
      - NGC-33
        - ▪ Concept:
          - Shape
          - Bulge
          - Planetarium (89)
          - Constellation (27)
          - Solar System (8)
          - Sun (2)
            - ○ Cosmic Year
            - ○ Solar Year
            - ○ Light Year
            - ○ Speed of Sun
- ❖ Scientist's Theory related to Revolution of Earth and Sun
- ❖ Revolution of Earth: (Concept of Day and Night & Winter and Summer)
  - ○ Astronomical Unit:
  - ○ Concept:
    - ▪ Northern Hemisphere
    - ▪ Equator
    - ▪ Southern Hemisphere
    - ▪ Aphelion (4 July: Summer in India)
    - ▪ Perihelion (3 Jan: Winter in India)
    - ▪ Apsideline
  - ○ Angle of Inclination of Earth:
- ❖ Planetarium (89):
  - ○ Polar Star:
  - ○ Saptarishi (group of 7 stars):
    - ▪ Ursa Minor:
    - ▪ Ursa Major:
  - ○ Orion (Hunter Star):
  - ○ Hydra:
- ❖ Big Bang Theory:
  - ○ Concept:
  - ○ Edwin Hubble's Theory:
  - ○ Big Crunch:
- ❖ The Origin of Solar System:
  - ○ Mono-Star Theory: (failed)
    - ▪ Kant:
    - ▪ Laplace:
  - ○ Dual-Star Theory: (failed)
    - ▪ Chamberlin:
    - ▪ James Jeans:

- Double-Star Theory: (accepted)
  - Littleton:

❖ Solar System:



- Sun:
- Planet (8):
  - Conditions (5):
  - Terrestrial Planet (4): (Inner Planets/Solid Planets/Small in Size/Min. Moon)
    - Mercury:
    - Venus:
    - Earth:
    - Mars:
  - Jovian Planet (4): (Outer Planet/Gaseous Planets/Big in Size/Max. Moon)
    - Jupiter:
    - Saturn:
    - Uranus:
    - Neptune:
- Study Earth (in detail):
  - Density:
  - Rotation of Earth:
    - Day – Night Scenario:
    - Coriolis Force:
    - Breeze:
  - Revolution of Earth: (365/366 days) + 6 hour
    - Year Changes
    - Season Changes
      - Day – Night (Small and Big) Concept:
      - Day – Night at Poles of the Earth Concept:
- Moon (Natural Satellite):
  - Study of Moon:
  - Revolution of Moon:
  - Phases of Moon: (28 days)
    - New Moon (Amawas):
    - Super Moon (Purnima):
    - Sukla Pakcha: (14 day)
    - Krishna Pakcha: (14 days)
  - Red Moon:
  - Facts:
  - Eclipse:



- Lunar Eclipse
- Solar Eclipse
  - Moon Transit
  - Tides and Syzygy Concept:
    - High Tide (Syzygy)
      - Conjunction
      - Opposition
    - Low Tide (Syzygy)
    - Neap Tide
  - Linear (eclipse)

- Pluto:
  - Reason of Non-Consideration as a Planer:
  - New Name: 134340
- Goldilocks Zone

[Ch. 02] Topography.

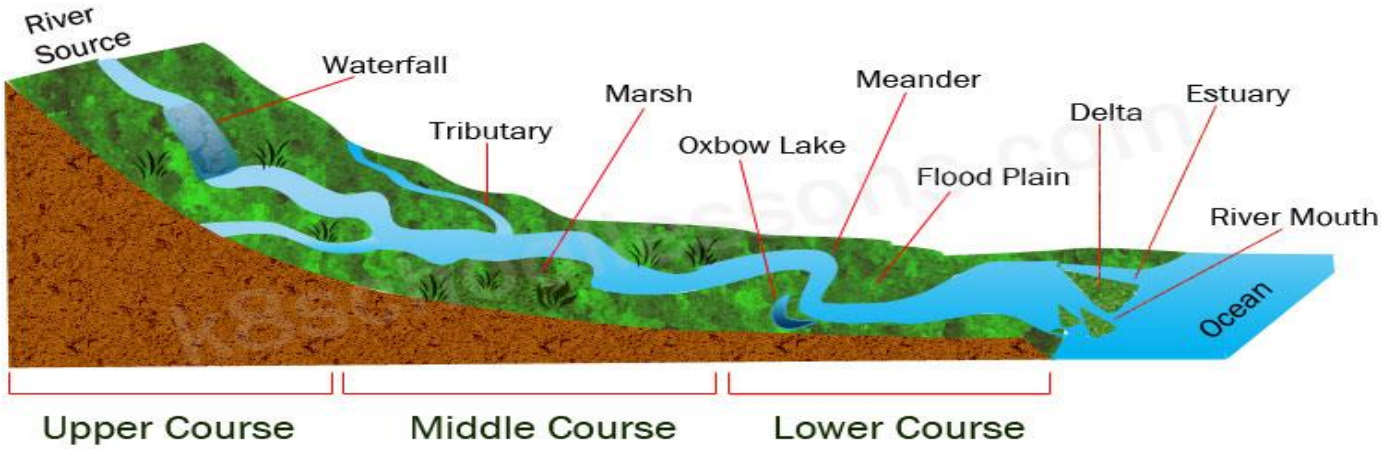
- Process of Topography:
  - Weathering (Breakdown) [Physical Weathering & Chemical Weathering].
  - Erosion (Friction).
  - Deposition (Stored).
- River Topography:
  - River Course (Position of River):
    - Upper Course (Stage of youth): Over the Mountain (Speed: Very High).
      - Origin of the River.
      - Weathering and Erosion.
      - Valley Formation:
        - V-Shaped Valley.


        - Gorge (Eg. Indus Gorges in Kashmir).

- I-Shaped Valley or Canyon (Eg. Grand Canyon – made by Colorado River in North America).

- Middle Course (Stage of Maturity): Over the Land (Speed: Medium Speed).
  - Erosion and Deposition.
- Lower Course (Stage of Old Age): Going to be end at Mouth (Speed: Very Low).
  - Mouth of the River
  - Deposition only.
  - Delta Formation.

- Note: Power of River = Due to Max. Height (called Gradient): Very High Speed
- Stages of River:



- Rapids (Eg. Rafting Area).
- Waterfall.
- Plunge Pool (Due to Waterfall)
- S-Shaped Valley/ Meander: Due to windy Course and Irregularities of Ground Force, the River started Swing in loop.
  - Natural Levees Formation: Very Fertile (Eg. Hwang Ho or Yellow River of China, called China's Sorrow).

  - Artificial Embankment (man-made): To prevent or minimize the risk of flood.
- OX-Bow Lake.
- Distributaries:
  - Delta:
    - Mountain on the Both side of the River (Estuarine Formation).
      - Eg. Narmada River, Tapti River (Western Ghat Mts; Small Estuarine)
    - No Mountain on the Both Side (Delta Formation only).
      - Alluvial Soil -> Form Delta (due to Deposition):
      - Very Fertile (Eg. Sundarbans Delta – made by Ganga River; Biggest is World).
    - Presence of Mountain on One Side only (Tooth-Like Projection).

        - Mountain side: Estuarine.
        - Other side: Delta.
        - Eg. Godavari River (Eastern Ghat Mts.)
            - Both form Estuarine (Biggest in India) and Delta.
    - Bird's Foot Delta form (Eg. Gulf of Mexico – America's Mississippi River).
    - River ends here.
    - Reason of Salinity of Sea:

❖ Ocean Topography:

- Lagoon Lake Formation:
    - Silt Present in the Sea. Waves of Sea in keep applying force to silt. Due to this, Silt moves toward coastal plain area.
    - And this silt forms a lake at coastal plain which is called Lagoon Lake (Eg. Chilka Lake of Odisha).
    - Reason for formation of Lagoon Lake is Wave of Sea.
    - Water of Lagoon Lake is Salty or Saline.
- Coastal Area of Sea is called Beach.
- Cave's formation in the Mountains present across coastal Area:
- Coastal Area:
    - Cliff

    - Fiord Coast

    - Ria Coast

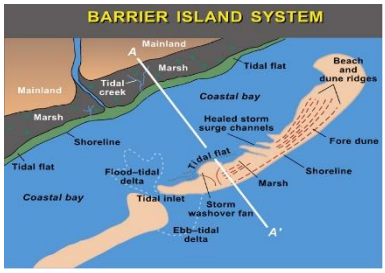
    - Dalmatian Coast

- Creek

- Gulf

- Bay
- Bight
- Spit (by Silt)

- Barrier (by Silt)



- Sea Level
- Depth of Sea
- Benthic
- Continental Self: 20% Petroleum
- Continental Slope
- Ocean Plain: 80% Petroleum
- Trench:
  - Mariana Trench
    - Deepest Trench: Challenger Deep
- Ridge
- Ocean Peak (Rock or Volcano)
- Petroleum extraction:
  - On-Shore (20%): From Near Coast.
  - Off-Shore (80%): From Ocean Plain
    - Oil Ridge used for Petroleum Extraction.


❖ Under-Water/Under-Ground Topography
- Facts: Limestone Region (Limestone Platea contain caves): Karst Region
- Limestone Cave (Karst Valley):
  - Entry point is called Blind Valley.
  - Water Drops Enters into Limestone Cave by Surface Stream.
    - Redeposited minerals build up after countless water drops form:
      - On Ceiling: called Stalactite.
      - On Floor: called Tufa (after becoming big is called Stalagmite).
      - After a long time, Stalagmite touches or meets the Stalactite and becomes Pillar or Cave Pillar.
- Hole
- Doline
- Uvala
- Window
- Polje
- Terra Rossa (Best for Coffee Farming).

❖ Ice Topography:
- Rate of Glacier Movement

- U-Shaped Valley

- Hanging Valley
- Nunatak Valley

- Cirque
- Aretes
- Bergschrund
- Col (Eg. Indira Col)
- Moraines

- Ice-Berg

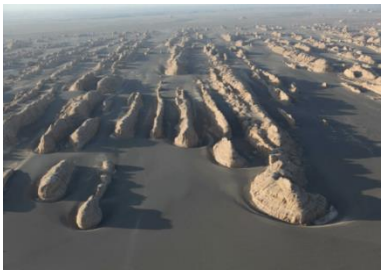
- Drumlin Glacier
- Esker Glacier

❖ Wind Topography:

- By Erosion:
  - Mushroom Rock

  - Bhu Stambh (Pillar)

- Yardang

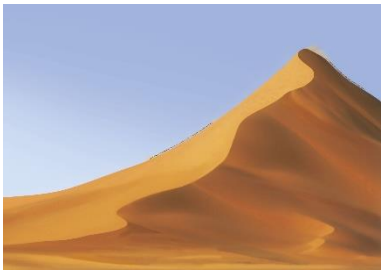
- Inselberg


- Dreikanter



- By Deposition:
  - Barchan/Barkhan

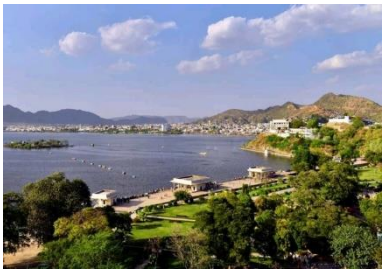

  - Sand Dunes (Stupa)


  - Loees Plain


  - Balson Lake: Salt + Silicon + Calcium (Eg. Aana Sagar Lake (Ajmer) -> Dry - > Playaa)





- Order of Relief:
  - 1st Order of Relief: Continent, Ocean.
  - 2nd Order of Relief: Plain, Plateau, Mountains, Desert.
  - 3rd Order of Relief: River, Under-water, Ice, Ocean, Coastal, Wind
    - By Erosion and Deposition.

[Ch. 03] Geology.

- Depth
- Surface's Temperature
  - Summer
  - Winter
- Edward Seus Theory: (not completely get success)
  - SiAl
  - SiMa
  - NeFe
  - Average Density of Earth
- New Theory:
  - Crust (1%):
    - Upper Crust (Acid) – Lower Crust (Base): Conorod Discontinuity Line
    - Crust – Mantle Line: Moho Discontinuity Line
    - Density: 2.5 gm/cm^3
    - Spheres:
      - Hydrosphere
      - Lithosphere/Geosphere
    - Volcano:
      - Volcano Erupts Internally:
        - Magna (from Mantle) [Hot]:
        - Lava [after getting Cold]:
          - Igneous Rock:
            - Intrusive Igneous Rock or Plutonic (said).
              - Eg. Granite, Gabbro.
            - Extrusive Igneous Rocks or Volcanic Rocks (said).
              - Eg. Beco Lith, Feco Lith, Teco Lith.
      - After Proper Outer-Volcano Eruption:
        - Magma (from Mantle) [Hot]:
        - Lava [after getting Cold]: Igneous Rock (Primary Rock) [95% available].
          - Igneous Rock (Primary Rock):
            - Crystal Structure.
            - Two types:
              - Black Colour Rock: Basalt
              - Grey Colour Rock: Granite
                - Used in Construction works
            - Metals Extraction (Very Expensive Metals found).
          - Sedimentary Rock (Secondary Rock):

                - Layered Rock (said).
                - Fossils found.
                - Fuel Extraction (Petroleum/Coal).
                - Eg. Sandy Rocks (Red Fort is made-up of).
                - Sand Stone
                - Clay
                - Smooth Soil
                - Limestone
                - Choak
                - Coal:
                    - Anthracite (A grade; Less Smoke; Found Max in china and Min India at J&K).
                    - Bituminous Coal (Household; Black; Soft; Max found in India).
                    - Lignite Coal (Brown Coal).
                    - Pit Coal (Worst Coal; More Smoke).
                - Petroleum
            - Metamorphic Rocks (become very strong).
                - After applying Temperature + Pressure on Sedimentary Rocks: Physical Changes.
                - Eg. Sangemarmar Stone (Extract from: Makrana, Rajasthan).
    - Mantle (83%):
        - Upper Mantle (Magma: Plasma State) – Lower Mantle: Repiti Discontinuity Line.
        - Mantle – Core Line: Gutenberg Discontinuity Line.
        - Density: 4 gm/cm^3.
        - Volcano Eruption.
        - Earth Quake (Birth Place).
    - Core (16%):
        - Upper Core – Lower Core: Lehmann Discontinuity Line.
        - State: Liquid.
        - Property: Magnetism.
        - Density: 11 gm/cm^3.
    - Rock Cycle:
        - Igneous Rock <- (Melting) - (Weathering) -> Sedimentary Rock.
        - Igneous Rock <- (Melting) - (Temp + Pressure) -> Metamorphic Rock.
        - Sedimentary <- (Weathering) - (Temp. + Pressure) -> Metamorphic

❖ Tectonic Plates (Concept):

- Tectonic Plates is present over Lithosphere.
    - Harry Hess's has given a theory of Tectonic plate. (1945)
    - Total Tectonic Plate (27):
        - Big (7): All Continents.
        - Small (20):
            - Fuca (USA)
            - Cocos (Mexico)
            - Nazca (Peru)
            - Africa Rift (East of the Africa)
            - Burma (Andaman)
            - Sunda (South China Sea)
            - Philippine (Philippine)
    - Earth-Quake:
        - Focus (starts).
        - Epicenter (surface).
        - Fault Line
        - Energy: Elastic Energy -> Wave
            - P (Primary Wave):
                - Speed: 6 KM/sec.
                - Empact: Low.
                - Medium: Solid, Liquid, Gas.

        - Longitudinal Wave (straight).
        - Frequency: (Count) Max.
        - Wavelength: (Distance) Min.
        - Amplitude: (Height) Min.
    - S (Secondary Wave):
        - Speed: 3.5 KM/sec.
        - Empact: Moderate.
        - Medium: Solid and not in liquid.
        - Transverse Wave (light).
        - Frequency: (Count) Average.
        - Wavelength: (Distance) Average.
        - Amplitude: (Height) Average.
    - L (Love Wave):
        - Speed: 1.5 KM/sec.
        - Empact: Very High.
        - Medium: Surface.
        - Elastic Wave.
        - Frequency: (Count) Less.
        - Wavelength: (Distance) Max.
        - Amplitude: (Height) Max.
    - Reason:
    - Earth-Quake Belt:
- Lithosphere (Upper Crust): Lithosphere is floating over Asthenosphere.
- Asthenosphere (Upper Mantle)

[Ch. 04] Indian Geography.

[Category 01] Mountain Range (14 Crore Old)

[01] Trans – Himalayan Range

- No Farming, No Animals.
- Height (Av.): 6000m.
- Cold.

[02] Brihad – Himalayan Range

- No Farming, No Animals.
- Height (Av.): 6100m.
- Very Cold.

[03] Madhya – Himalayan Range

- Forest, Grass (Marg: Son Marg, Gulmarg; Pyaal said in Uttarakhand).
- Height (Av.): 3000m.
- Best for Tourism: Kullu, Shimla, Manali, Dalhausi, Ranikhet, Nainital

[04] Shivalik – Himalayan Range

- Farming and Animals.
-

[Category 02] Plain Region

[Category 03] Plateau Region

[Category 04] Coastal + Island Region

[Ch. 05] World Geography.
