

FUNDAMENTALS OF GEOLOGY

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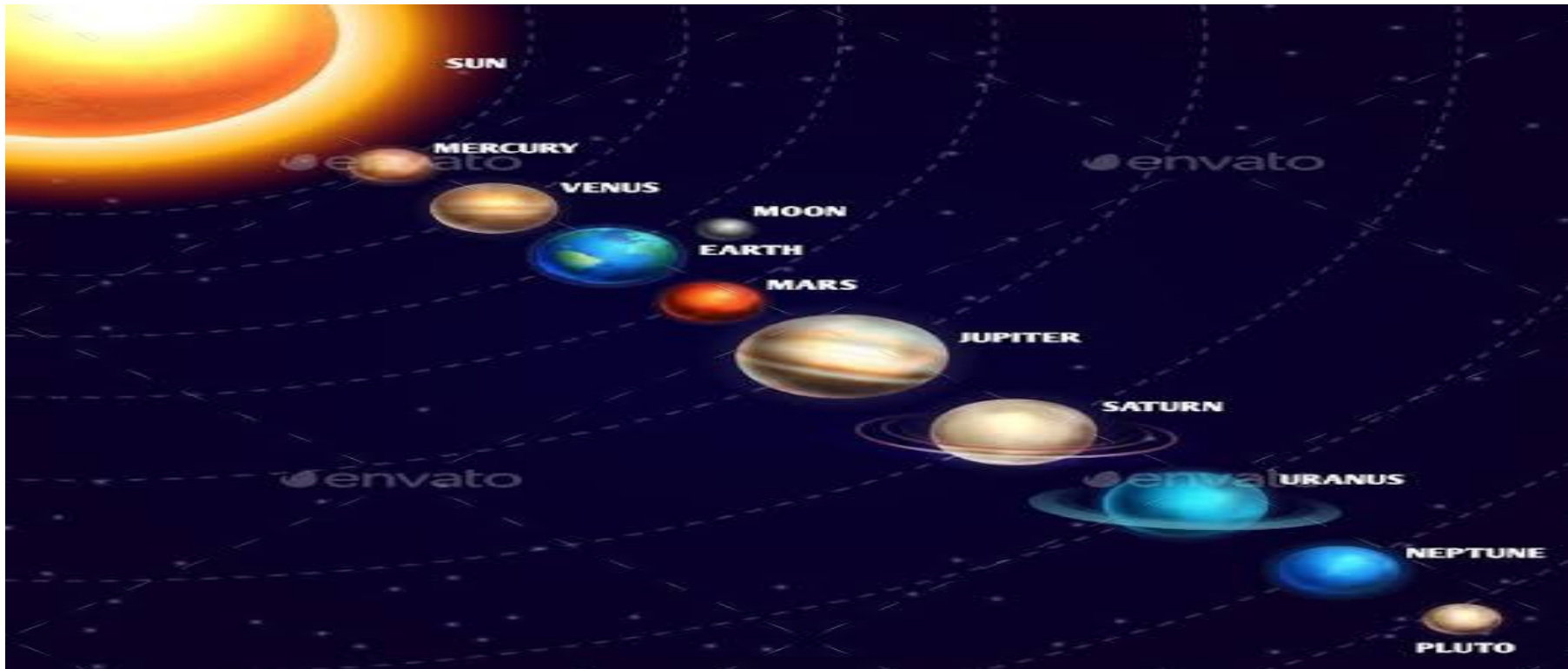
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The Solar System:

- A star may be defined as a huge, massive body of luminescent matter radiating enormous amount of energy every second.
- Each star holds around itself, under the influence of force of gravity a variable number of relatively small sized, non-radiant bodies of matter, called planets.
- The basic difference between a star and a planet is in their masses: a star is thousands times bigger than planet.
- Because of such an enormous mass very high temperatures are reached in the interior of a star that make it radiate energy.

- Sun is also a typical star.
- It has nine planets held and revolving around it under gravitation.
- The nine planets revolving around the sun in order of their increasing distance from sun have been named as Mercury, Venus, the Earth, Mars, Jupiter, Saturn, Uranus , Neptune and Pluto.



Parts of the earth

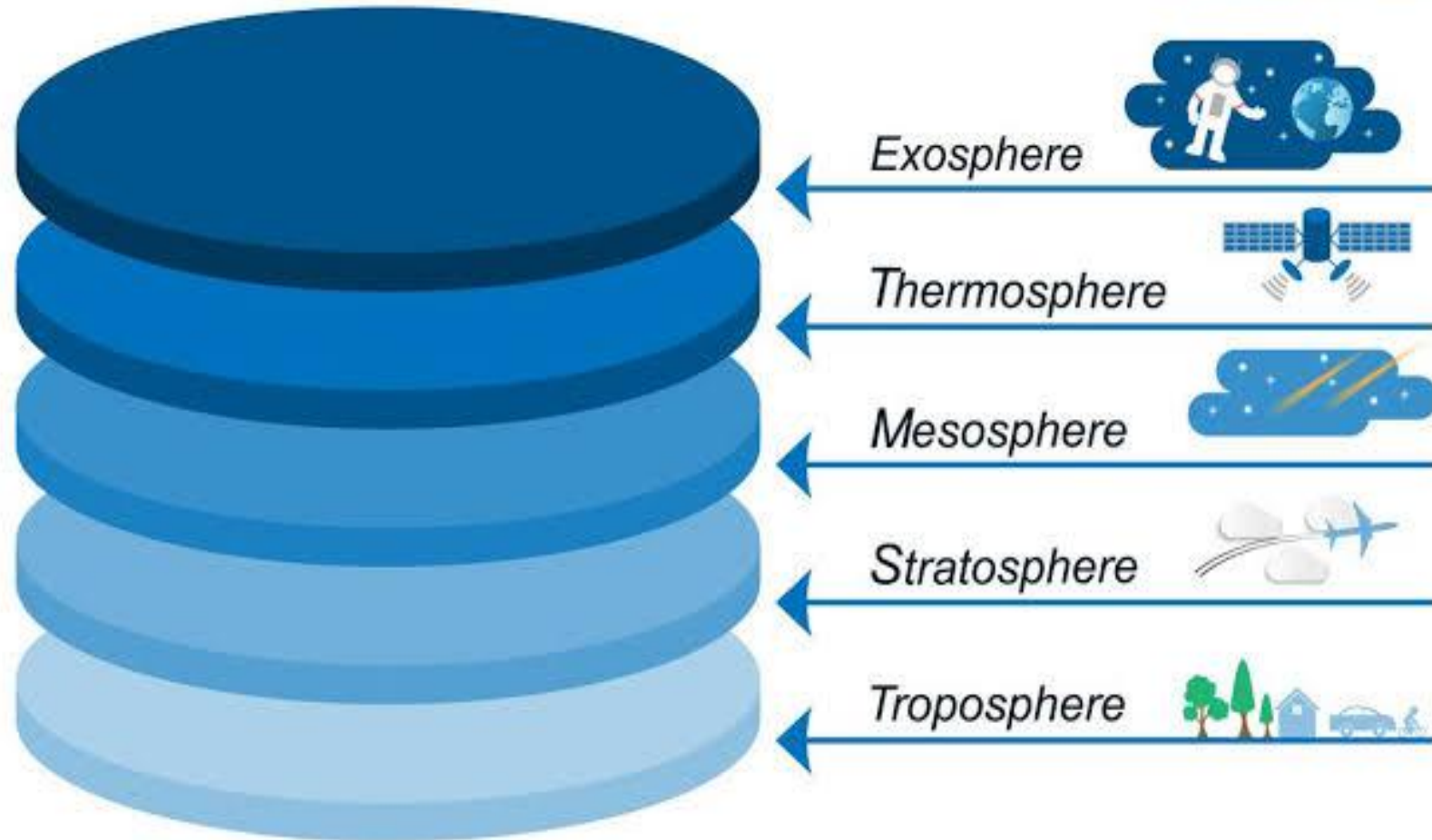
- Atmosphere
- Lithosphere
- Hydrosphere

Atmosphere:

- The outer gaseous part of the earth starting from the surface and extending as far as 700 Km is termed atmosphere.
- It is established that the atmosphere possesses a layered structure.
- Chemically the atmosphere is made up of a mechanical mixture of gases commonly called air.
- Chemical composition of atmosphere:

Component	Volume percentage
Nitrogen	78.084
Oxygen	20.946
Argon	0.934
Carbon dioxide	0.033
Others (Ne,He,Kr etc.)	0.003

Atmosphere of Earth



The Troposphere:

- It is lowermost zone of the atmosphere rising from the surface of the earth and extending on an average height of 11 Km.
- Troposphere contains almost nine-tenths of total mass of the atmosphere.
- It is layer of gases that is responsible for most of the weather forming processes on earth.
- Troposphere plays great role in sustaining life on Earth.

The Stratosphere:

- It is the second layer of the atmosphere starting from the tropopause and extending up to an average height of 50 Km.
- It contains the entire concentration of Ozone gas that occurs above the earth in the form of well define envelope distinguished as the Ozone layer.

The Mesosphere:

- Third zone of atmosphere begins at stratosphere at about 50 km and continue up to height above 80 km.

The Thermosphere:

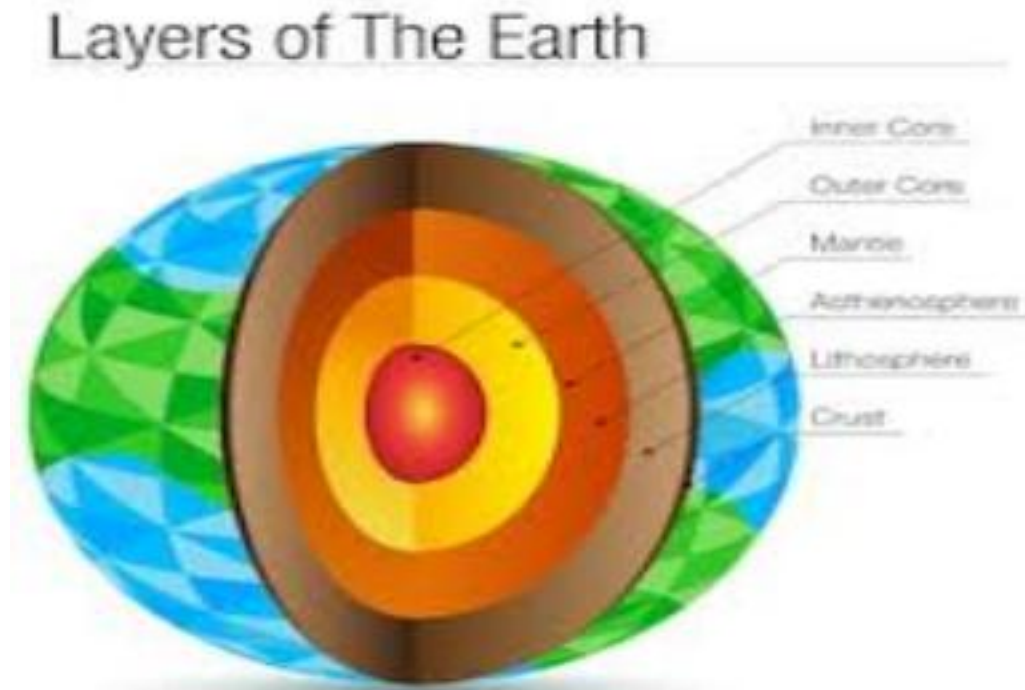
- The fourth and last zone starts at about 80 km and extend up to 500 km and beyond.

The Ionosphere:

- It starts from 80 km and extends upwards to variable heights.

The Lithosphere

- The solid part of the earth.
- It consists of three main layers: crust, mantle and core



The Crust

- Is the outermost layer of the earth.
- Has a depth of about 32 to 40 km.
- The thinnest layer.
- The uppermost layer is known as the SIAL.
- It is composed mainly of silicon and aluminum
- The bottom layer of the crust is called SIMA
- It is made mostly of silicon and magnesium.
- Crust are further divided into two major parts:Continental crust, Oceanic Crust

The Mantle

- Located just below the crust.
- It is denser than crust, about 2,900 km thick.
- It is composed mainly of very hot, solid rocks that flow.
- The region between the crust and the mantle is called MOHOROVICIC DISCONTINUITY OR MOHO.
- Scientists have been able to confirm the differences in density between rocks of the crust and those of the mantle by studying the Moho.

The Core

- It is about 4,960 km deep.
- It is divided into:

1. Outer core:

- It is about 2,270 km thick
- Composed mainly of nickel and iron melted by intense heat.

2. Inner Core:

- It is composed mainly of solid iron and nickel.
- The pressure is exceedingly high.

Branches of Geology

- Physical Geology
- Geomorphology
- Mineralogy
- Petrology
- Historical Geology
- Economic Geology

Weathering

- weathering is defined as the process of decay of rocks under the influence of certain physical and chemical agencies. The decayed product remains at or near parent body because weathering agencies do not involve themselves in the removal of end product to any distance.

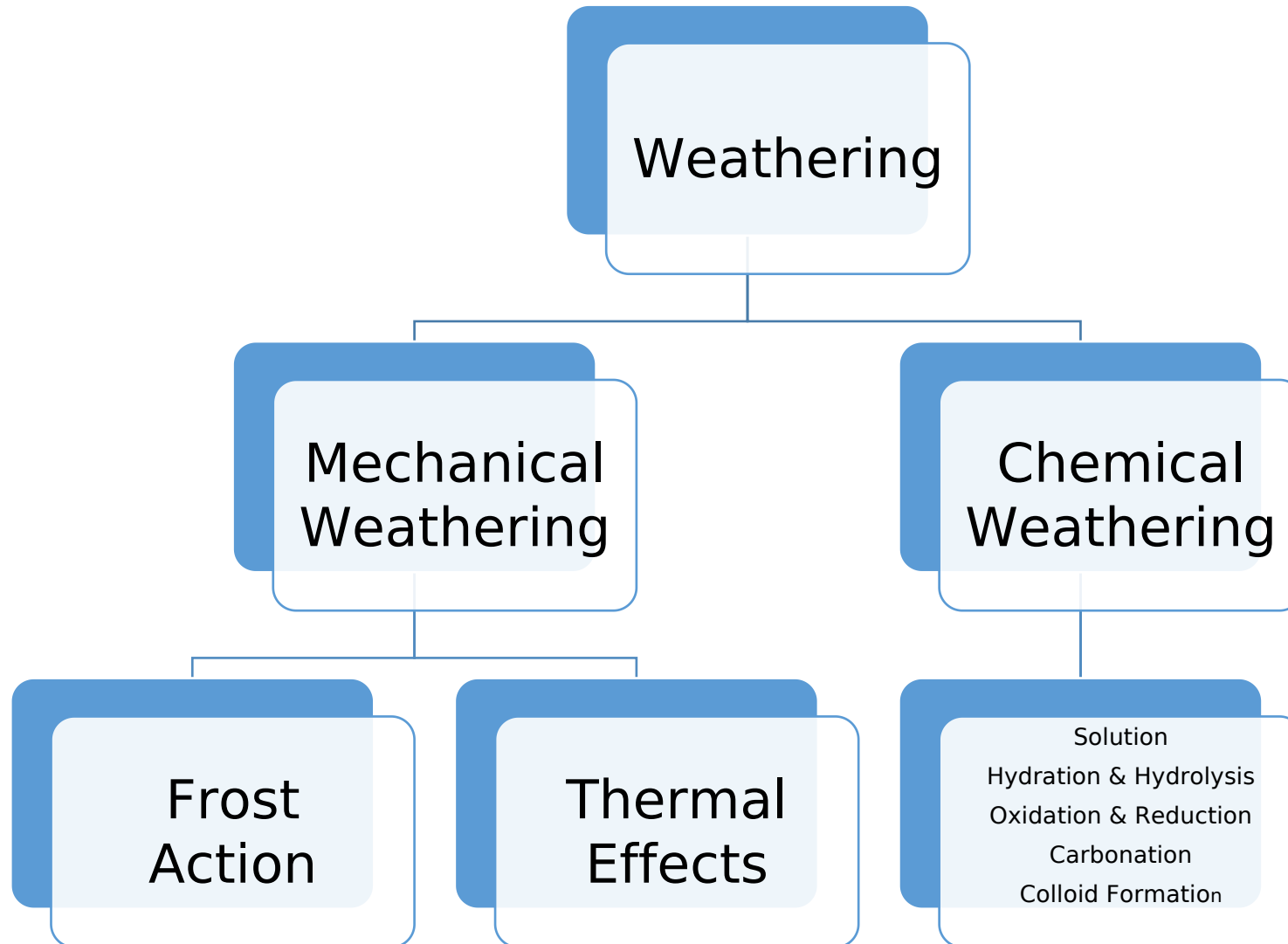
Erosion:

- It is defined as breakdown of rocks by some natural agencies having motion as wind, running water and moving ice. By virtue of their velocity broken particles move away from parent rocks.

Denudation:

- It is a term expressing sum of the processes of weathering and erosion.

Geological work of atmosphere



Factors affecting weathering:

- Nature of the rock
- Climate
- Physical Environment

Products of weathering:

- Eluvium
- Deluvium

Geological work of wind:

1. Wind Erosion: Deflation

Wind Abrasion

Wind Attrition

2. Sediment Transport by Wind: Source of Sediment

Methods of Transport

The Transport Power of Wind

3. Deposition by Wind: Duens

Loess

Geological work of water:

Sources of Stream Water:

- Runoff
- Subsurface Water
- Glacial Melt Water

Methods of river erosion:

- Hydraulic Action
- Cavitation
- Abrasion
- Attrition
- Corrosion

Rate of river erosion:

- Velocity of stream
- Nature of rocks
- Load

Thank You