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Q1 What are the different layers of the atmosphere? On what basis these layers are classified? In which layer 'Auroras' are formed and where do satellites orbit?

The earth's atmosphere is divided into distinct layers based on **temperature changes** and other characteristics as **altitude increases**. These layers are classified based on the variation of temperature with altitude.

- **Layers of Atmosphere:**
There are 5 layers of atmosphere.

1) Troposphere:-
It is the first layer above the surface and contains half of the Earth's atmosphere. The troposphere begins at the earth's surface and extends from **12km – 16km** high. Temperature decreases with altitude.

- **Functions:**
- All the weather occurs in this region.

- Cloud formation
- Green House Effect

. **Tropopause:**
It is a small region which separates troposphere and stratosphere.

2) Stratosphere:-

Stratosphere is the second layer and extends from the troposphere to around **50km** above the earth's surface.

. Temperature increases with altitude due to the presence of ozone layer which absorbs and scatter the UV radiation from the Sun.

. **Function:**
Commercial jet often fly at the lower part of stratosphere because it contain more stable and fine environment.

. **Stratopause:**
It is a small region which separates stratosphere and mesosphere.

3) Mesosphere:-

Mesosphere is the third layer and extends from the stratosphere to around **85km-95km** above the earths surface.

- Temperature decreases with increasing altitude.
- **Function:**
  This is where meteors burn up upon entering the atmosphere.
- **Mesopause:**
  It is a small region which separates the mesosphere and thermosphere.

4) Thermosphere:-

Thermosphere is the fourth layer and extends from the mesosphere to the exosphere, approximately **600km** above the earth's surface.

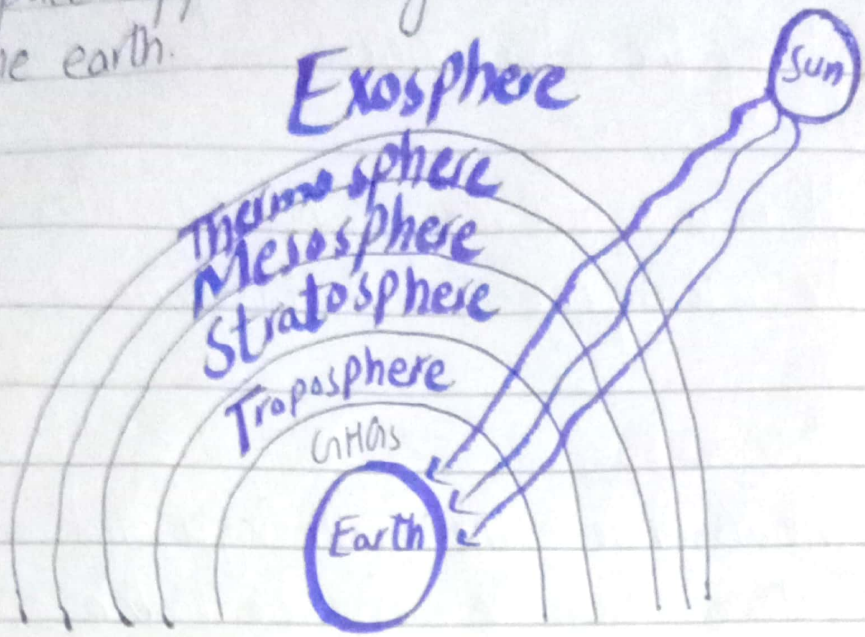
- Temperature increases with significant increasing altitude due to absorption of the UV and X-ray radiations from the Sun.
- Thermosphere contains **ionosphere** in which gases are ionized and radio signals to be reflected back to earth.

Function:

Satellite operations also occurs in thermosphere.

5) Exosphere:-

It is the last layer of atmosphere and extends from the thermosphere to the space approximately **10000 km** above the earth.



- **Auroras:**

Auroras is also known as **Northern and Southern lights (borealis aurora and australis aurora)** are natural lights display in the sky and seen near the polar regions. They occured in the thermosphere and upper mesosphere. **Auroras** are caused by the interaction of charged particles from the ~~(~~solid wjx salar wind with gases in the earth's atmosphere resulting in **colorful light emissions.**

- **Satellite Orbits:**

Most satellites orbit the earth in the thermosphere and exosphere includes Low Earth orbit, Medium Earth orbits and Geostationary orbits. The thermosphere provides the satellites a suitable environment for satellite operations and orbits. At all these altitudes allow satellites to perform different functions such as communication, navigation, weather information, scientific research etc.

Q2 Describe water cycle and briefly explain the major processes involved in water cycle?

- **Hydrological Cycle / Water Cycle:**

Hydrological cycle is the conceptual phenomena that describes the storage and movement of water between the biosphere, lithosphere, atmosphere and hydrosphere.

- **Physical Changes Involved:-**

- Gaseous
- Liquid
- Solidification - the process powered by sun and gravity.

• Steps Involved in Water cycle:

1) Evaporation:

Sun is the main source of evaporation as the molecules of kinetic energy increase due to heat energy. The molecules which have higher kinetic energy leave the surface. Therefore, 90% atmosphere water comes from evaporation.

2) Evapo-transpiration:

It is the 10% atmosphere water which comes from living organisms, powered by sun and heat released from metabolism.

3) Condensation:

As air rise upward it cools down and the water vapour present in the air starts to condense. Moist starts to

together around the dust particles which form droplets.

4) Precipitation:-

When droplets become heavy air falls hold them than under the action of gravity falls in the form of rain, fog or hail.

5) Surface Run off:-

Includes the variety of ways through which its run off to the ocean and rivers etc. When the flow of water on the ground absorbed by plants with water reserviors then where evaporation occurs.

6) Infiltration:-

It is the movement from the surface to the ground. It depends on the types of soil and rock permeability, where water combines with ground water. Ground water was absorbed by plants and animals and it was released in the form of transpiration and sweating.

7) Drinking / Absorption:-

There are the many ways of absorption by living organisms.

Diagram