

- **TROPOSPHERE**

This is the layer of the atmosphere closest to the Earth's surface, extending up to about 10-15 km above the Earth's surface. It contains 75% of the atmosphere's mass. The troposphere is wider at the equator than at the poles. Temperature and pressure drops as you go higher up the troposphere.

**The Tropopause:** At the very top of the troposphere is the tropopause where the temperature reaches a (stable) minimum. Some scientists call the tropopause a "cold trap" because this is a point where rising water vapor cannot go higher because it changes into ice and is trapped. If there is no cold trap, Earth would lose all its water!

The uneven heating of the regions of the troposphere by the Sun causes convection currents and winds. Warm air from Earth's surface rises and cold air above it rushes in to replace it

# Tropopause

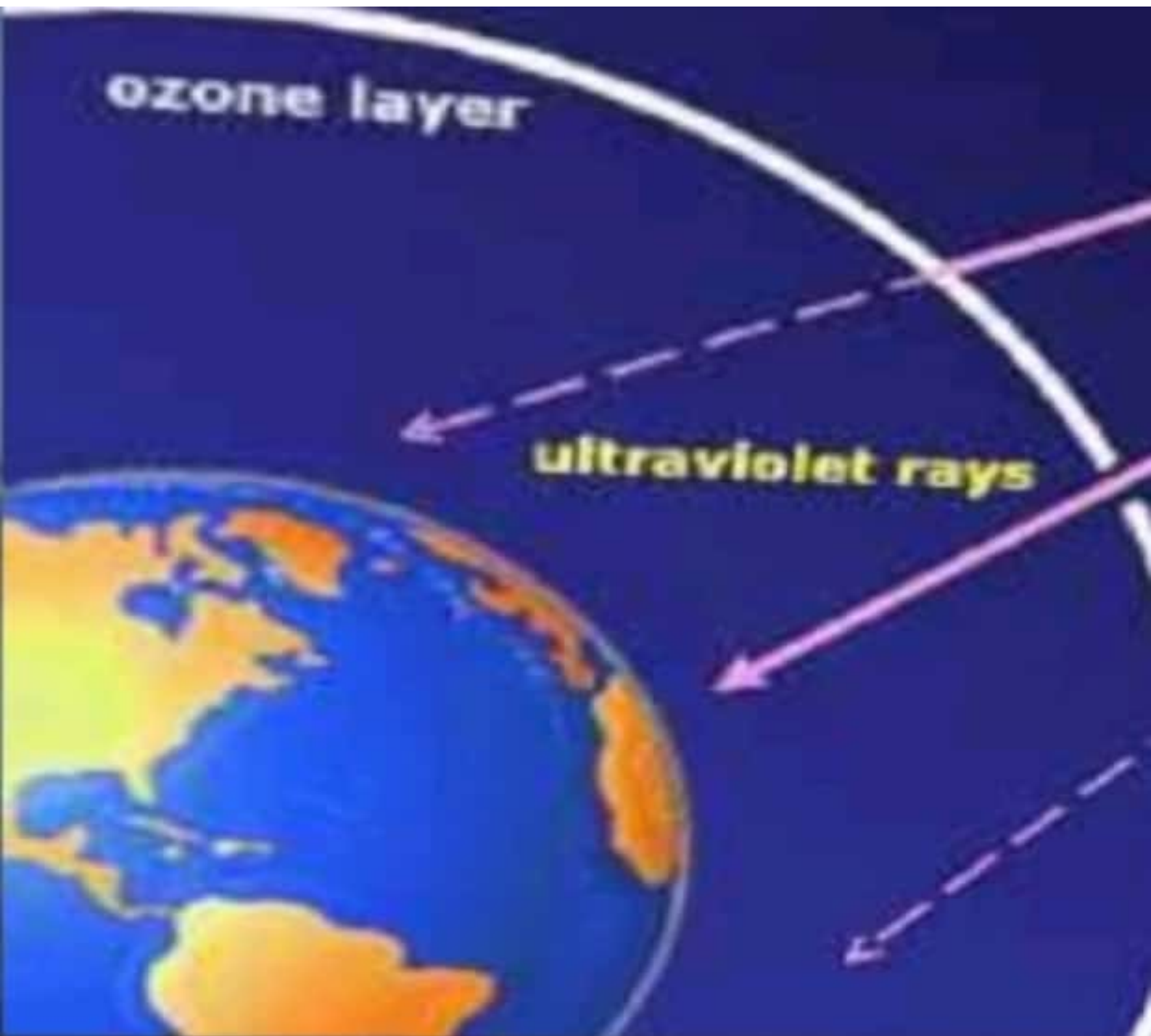
- The zone separating the troposphere from stratosphere is known as the tropopause. The air temperature at the tropopause is about minus 80°C over the equator and about minus 45°C over the poles. The temperature here is nearly constant, and hence, it is called the tropopause.

- **STRATOSPHERE**

This layer lies directly above the troposphere and is about 35 km deep. It extends from about 15 to 50 km above the Earth's surface. The lower portion of the stratosphere has a nearly constant temperature with height but in the upper portion the temperature increases with altitude because of absorption of sunlight by ozone. This temperature increase with altitude is the opposite of the situation in the troposphere.

- **The Ozone Layer**

The stratosphere contains a thin layer of ozone which absorbs most of the harmful ultraviolet radiation from the Sun. The ozone layer is being depleted, and is getting thinner over Europe, Asia, North American and Antarctica --- "holes" are appearing in the ozone



# Statopause

- The **stratopause** (formerly Mesopeak) is the level of the atmosphere which is the boundary between two layers: the stratosphere and the mesosphere. In the stratosphere the temperature increases with altitude, and the **stratopause** is the region where a maximum in the temperature occurs.

## • Mesosphere

The mesosphere lies above the stratosphere, which extends up to a height of 80 km. In this layer, once again, temperature starts decreasing with the increase in altitude and reaches up to minus 100° C at the height of 80 km.

## • THERMOSPHERE

The thermosphere extends from 80 km above the Earth's surface. The thermosphere is the fourth layer of the Earth's atmosphere. It is found above the mesosphere. The air is really thin that high up. The temperature changes with the solar activity. If the sun is active, temperatures in the thermosphere can get up to 1,500°C or higher!



# Inosphere

- The ionosphere is located between 80 and 400 km above the mesopause. It contains electrically charged particles known as ions, and hence, it is known as ionosphere. Radio waves transmitted from the earth are reflected back to the earth by this layer. Temperature here starts increasing with height.

- ***The Exosphere***

The **exosphere** is the uppermost layer of Earth's atmosphere. In the exosphere, an upward travelling molecule moving fast enough to attain escape velocity can escape to space with a low chance of collisions; if it is moving below escape velocity it will be prevented from escaping from the celestial body by gravity. In either case, such a molecule is unlikely to collide with another molecule due to the exosphere's low density.

# Elements of Weather and Climate

- The main elements of atmosphere which are subject to change and which influence human life on earth are temperature, pressure, winds, humidity, clouds and precipitation.