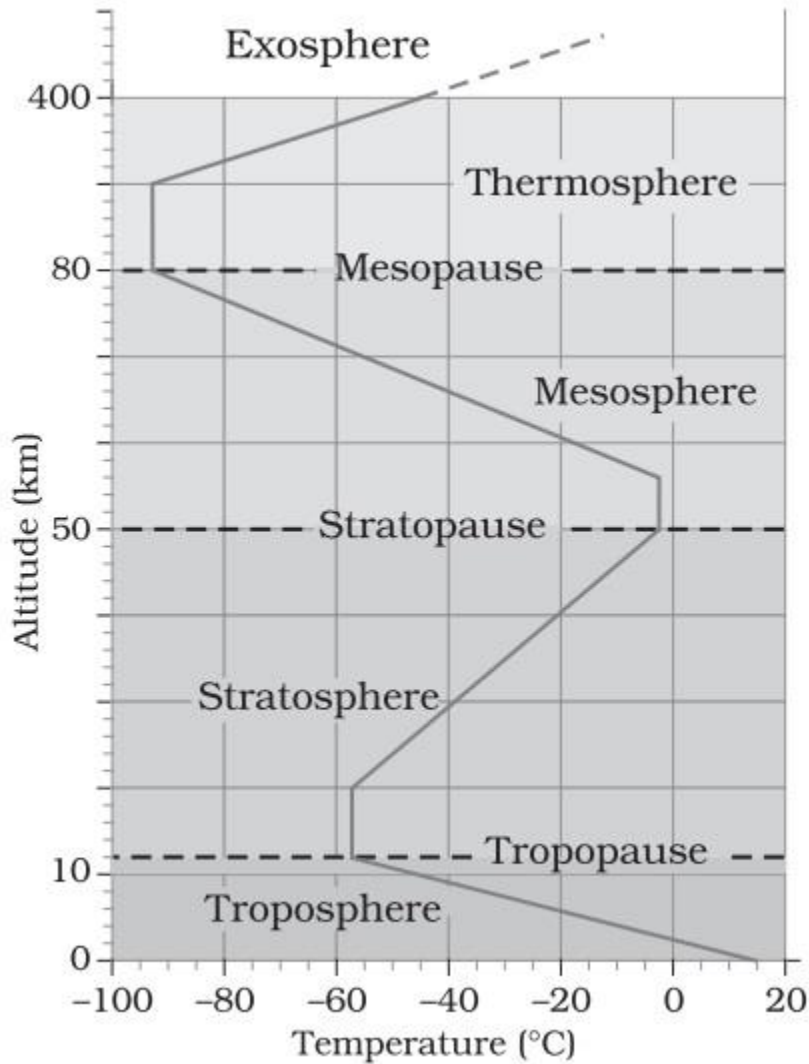


Structure of Atmosphere

Our atmosphere is composed of many components. But the structure of the atmosphere is a combination of various layers.

The structure of the atmosphere is represented in a pictorial form below:



There are five layers in the structure of the atmosphere depending upon temperature. These layers are:

- Troposphere
- Stratosphere
- Mesosphere
- Thermosphere
- Exosphere

This is an important topic in the Geography syllabus for [UPSC 2021](#) Exam.

Troposphere

- It is considered as the lowest layer of Earth's atmosphere.
- The troposphere starts at the surface of the earth and goes up to a height of 8 kms (poles) to 18 kms (equator). The main reason of higher height at the equator is due to presence of hot convection currents that push the gases upward.
- All kinds of weather changes occurs within this layer.
- This layer has water vapor and mature particles.
- Temperature decreases with increasing height of atmosphere at the rate of 1 degree Celsius for every 165 m of height. This is called **Normal lapse rate**.
- Tropopause, the transitional zone, separates Troposphere and Stratosphere.

Stratosphere

- It is the second layer of the atmosphere found above the troposphere.
- It extends up to a height of 50 km from the earth's surface.
- This layer is very dry as it contains little water vapour.
- This layer provides some advantages for flight because it is above stormy weather and has steady, strong, horizontal winds.
- The ozone layer is found in this layer.
- The ozone layer absorbs UV rays and safeguards earth from harmful radiation.
- Stratopause separates Stratosphere and Mesosphere.

Mesosphere

- The Mesosphere is found above the stratosphere.
- It is the coldest of the atmospheric layers.
- The mesosphere starts at 50 km above the surface of Earth and goes up to 80 km.
- The temperature drops with altitude in this layer.
- By 80 km it reaches -100 degrees Celsius.
- Meteors burn up in this layer.
- The upper limit is called Mesopause which separates Mesosphere and Thermosphere.

Thermosphere

- This layer is found above Mesopause from 80 to 400 km.
- Radio waves that are transmitted from the earth are reflected by this layer.
- The temperature starts increasing again with increasing height in this layer.

- Aurora and satellites occur in this layer.

Ionosphere

- The lower Thermosphere is called the Ionosphere.
- The ionosphere consists of electrically charged particles known as ions.
- This layer is defined as the layer of the atmosphere of Earth that is ionized by cosmic and solar radiation.
- It is positioned between 80 and 400 km above the Mesopause.

Exosphere

- It is the outermost layer of the atmosphere.
- The zone where molecules and atoms escape into space is mentioned as the exosphere.
- It extends from the top of the thermosphere up to 10,000 km.

What are 3 facts about the atmosphere?

The atmosphere layer closest to the earth is referred to as the troposphere. Beyond the troposphere are the stratosphere, the ozone layer, the mesosphere, and the thermosphere. The atmosphere is made up of 78% nitrogen, 21% oxygen, and smaller amounts of argon, carbon dioxide, helium, and neon.

Which is the coldest layer of the atmosphere?

The top of the mesosphere is the coldest area of the Earth's atmosphere because temperature may locally decrease to as low as 100 K (-173°C).

What is the hottest layer of the atmosphere?

The thermosphere is often considered the "hot layer" because it contains the warmest temperatures in the atmosphere. Temperature increases with height until the estimated top of the thermosphere at 500 km. Temperatures can reach as high as 2000 K or 1727 °C in this layer.

What is 80% of the atmosphere?

About 80% of the total mass of the atmosphere is contained in the troposphere. It is also the layer where the majority of our weather occurs. Maximum air temperature also occurs near the Earth's surface in this layer.

Why is the atmosphere so important?

The atmosphere is important for many reasons! One reason is that the earth's atmosphere acts as an insulating layer that protects the earth's surface from the intense light and heat of the sun. The atmosphere is also important because it contains oxygen, which we and other living organisms breathe.

