

## Layers of the Atmosphere

### *The Troposphere*

The lowest layer in the atmosphere is the troposphere where weather mostly takes place. This layer is also primarily responsible for the state of our air quality. About 80% of the atmosphere's mass, including most of the earth's water vapor, is situated within this layer. As one moves up within the troposphere, density, temperature and pressure decrease. However, due to meteorological factors, sometimes temperature can increase with height. This is called a "temperature inversion".

### *The Stratosphere*

Moving higher into the atmosphere, the stratosphere is next in line. In contrast to the troposphere, temperatures within the stratosphere increase with height. Ozone plays a major role in regulating the thermal (heat) structure of this layer by absorbing ultraviolet radiation from the sun. (If you missed our ozone topic, read about it here: [Ozone, The Invisible Irritant](#)).

### *The Mesosphere*

Hovering beyond 30 miles in altitude, we enter the realm of the mesosphere. The stratosphere and the mesosphere are sometimes referred to as the "middle layers" of our atmosphere. In this layer, temperature again decreases with height. Some of the coldest temperatures are found at the top of this layer (-130°F) since the air is extremely thin and unable to regulate any heat.

### *The Thermosphere*

Finally, we move on to the Thermosphere. This layer is situated just above the mesosphere and extends from around 60 miles to between 300 and 600 miles above earth's surface. Temperatures in the upper thermosphere can soar from 900°F to 3,500 °F. However, it would still feel very cold. The reason for that is because at this extreme altitude, individual gas molecules are vastly separated from one another. When high energy particles from the sun smash into one of these gas molecules, they become very "excited" and move at very rapid speeds. Since temperature is really the average kinetic (motion) energy of particles, their very fast speeds will result in a very high temperature.

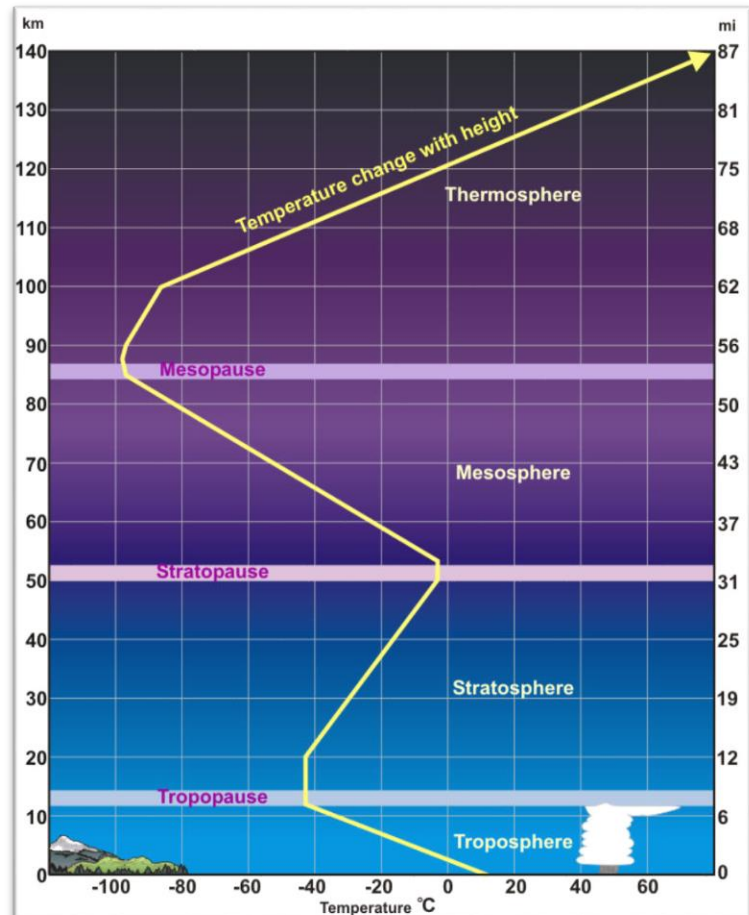


Image Source: [NOAA.Gov](#)