

Mesosphere Encyclopedia Article

Mesosphere

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Based on the vertical **temperature** distribution in Earth's atmosphere, four semi-horizontal layers or "spheres" can be distinguished: the **troposphere**, **stratosphere**, mesosphere, and thermosphere,. These layers are separated by "pauses," where no change in the temperature occurs with altitude change: the tropopause (between the troposphere and the stratosphere), the stratopause (between the stratosphere and the mesosphere), and the mesopause (between the mesosphere and the **thermosphere**). The stratosphere and mesosphere together are called the middle atmosphere, and their region also overlaps with the **ionosphere**, which is a region defined on the basis of the electric charges of the particles there.

The mesosphere, which means middle sphere, is the third layer of Earth's atmosphere, between the stratosphere, and the thermosphere. It is located from about 55 kilometers (35 miles) to 85 kilometers (54 miles) above the surface of Earth. Temperature here decreases with height, so within the mesosphere it is warmest at its lowest level (-5°C , or 23°F), and becomes coldest at its highest level (-80°C , or -112°F). Depending on **latitude** and season, temperatures in the upper mesosphere can be as low as -140°C (-220°F). The temperature in the mesosphere is lower than the temperature of the troposphere or stratosphere, which makes the mesosphere the coldest among the atmospheric layers. It is colder than Antarctica's lowest recorded temperature, and it is cold enough to freeze **water** vapor into **ice clouds**, which can be seen mostly after sunset.

Although the air in the mesosphere is relatively mixed, it is very thin, resulting in low **atmospheric pressure**. At this height, not only concentrations of **ozone** and water vapor are negligible, air in the mesosphere contains much less **oxygen** than in the troposphere. The mesosphere is also the layer in which many meteors burn up when they enter the earth's atmosphere, as a result of the collision with some of the gas particles present in this layer.

See Also

Atmospheric Composition and Structure; Stratosphere and Stratopause; Thermosphere