

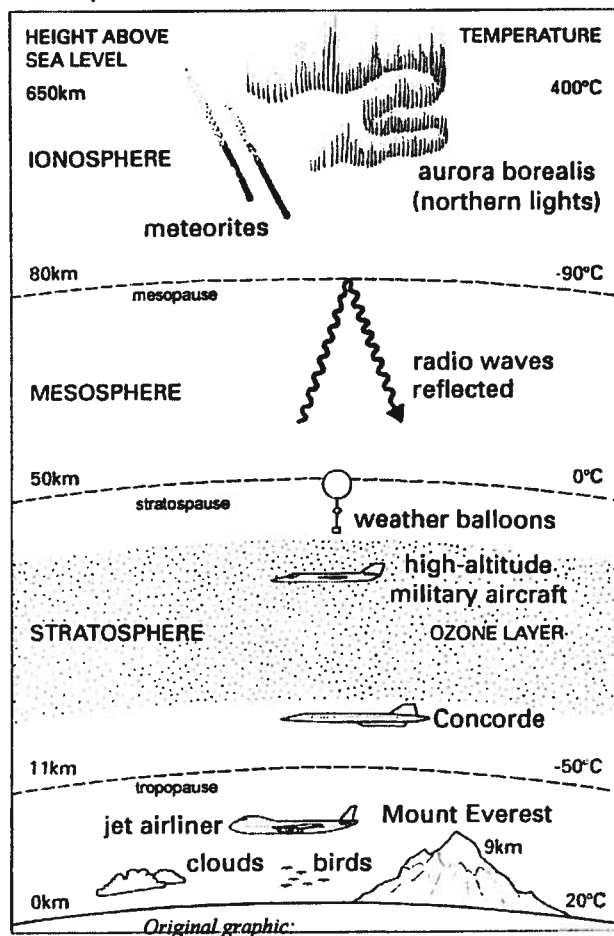
## Graphing the Atmosphere

**Purpose:** To visualize how the atmosphere can be divided into layers based on temperature changes at different heights by making a graph.

**Background Information:** The atmosphere can be divided into four layers based on temperature differences. The layer closest to the Earth is called the troposphere. Above this layer is the stratosphere, followed by the mesosphere, then the thermosphere. The upper boundaries between these layers are known as the tropopause, the stratopause, and the mesopause, in that order. The final layer is called the exosphere.

Temperature differences in the four layers are caused by the way solar energy (energy from the Sun) is absorbed as it moves downward through the atmosphere. The Earth's surface absorbs most of the Sun's energy. Some of this energy is bounced back out by the Earth as heat, which warms the troposphere.

The atmosphere



At the mesopause, the temperature begins to increase with altitude, and this trend continues in the thermosphere. Solar energy hits the Earth's atmosphere and heats it.

The mesosphere does not absorb solar heat, so the temperature decreases with altitude.

The temperature begins to increase with altitude in the stratosphere. This warming is caused by a form of oxygen called ozone ( $O_3$ ) absorbing ultraviolet radiation from the sun.

The average temperature in the troposphere rapidly decreases with altitude – it's colder the higher you go.