Atmosphere


EXOSPHERE
THERMOSPHERE
MESOSPHERE
STRATOSPHERE
TROPOSPHERE
OZONE LAYER

Essential Standard 2.5

Understand the structure of and processes within our atmosphere.

Learning Objective 2.5.1

Summarize the structure and composition of our atmosphere.

I Can Statements

At the end of this lesson, you should be able to say, with confidence:

- I can list the main gases found in the atmosphere.
- I can describe the various layers of atmosphere and describe their characteristic.

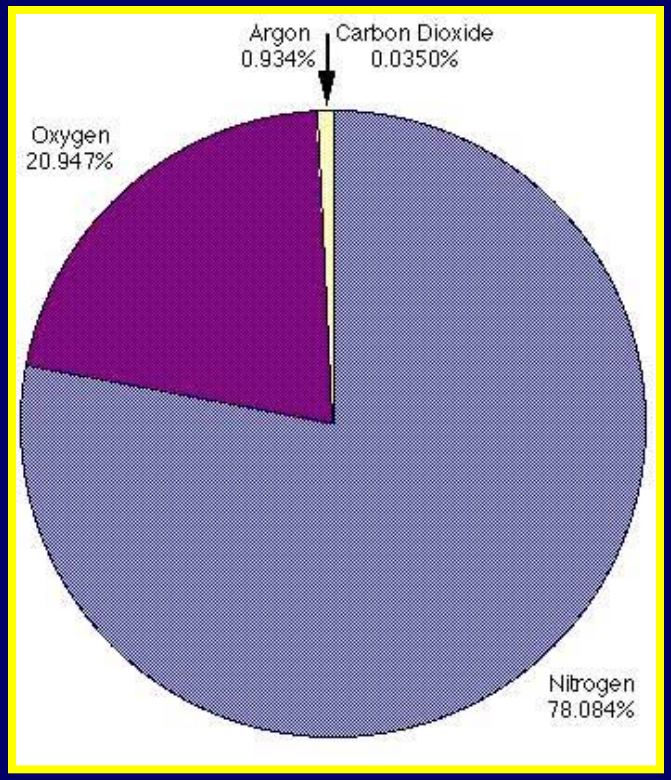
Atmosphere

The atmosphere is a blanket of gases that surrounds Earth and is held here by Earth's gravity.

The atmosphere extends 800 miles out into space.

Atmospheric Composition

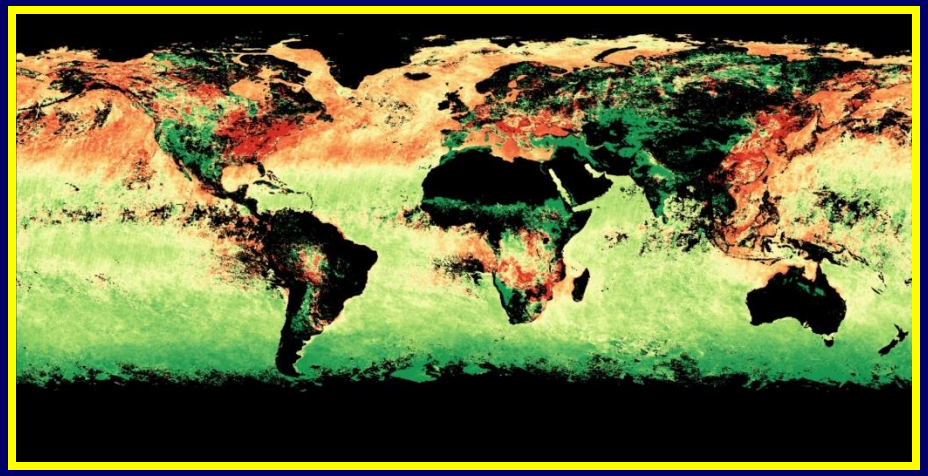
The majority of the atmosphere consist of nitrogen gas, N_2, that is very stable and non-combustible.



- 78% Nitrogen gas
- 21% Oxygen gas
- 1% - Other gases
  - Argon
  - Carbon Dioxide
  - Water Vapor
  - Methane
  - Ozone

Particulate Solids

Besides gases, the atmosphere also contains tiny particles of dust and salt that play an important role in cloud formation.



Red color represents concentrations of atmospheric dust particles.

Atmosphere Structure

The atmosphere is made up of different layers that differ in composition and temperature.

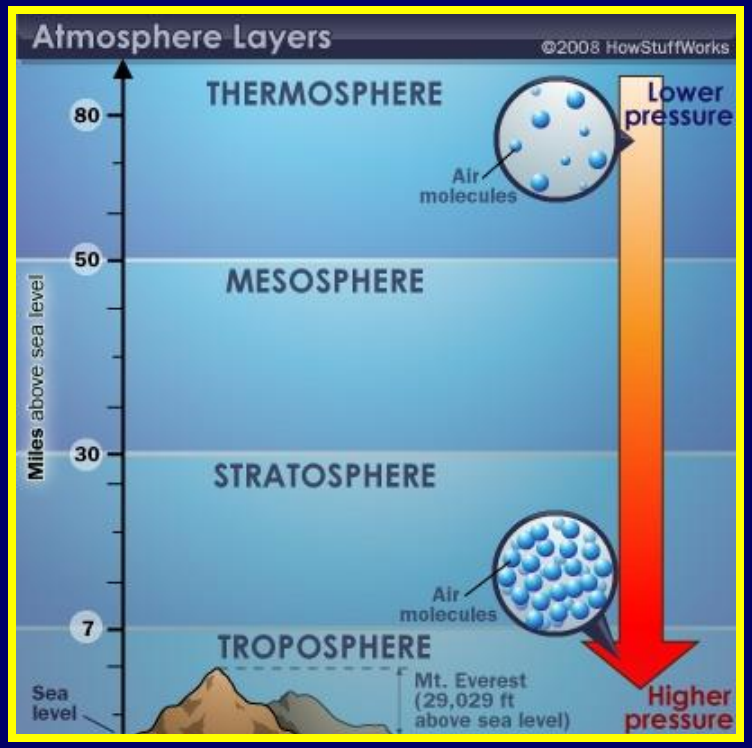
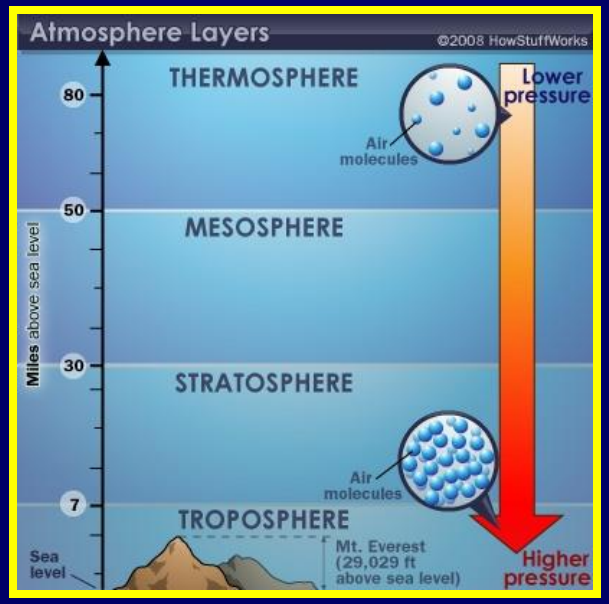


Photo taken by astronauts on the space shuttle

Troposphere

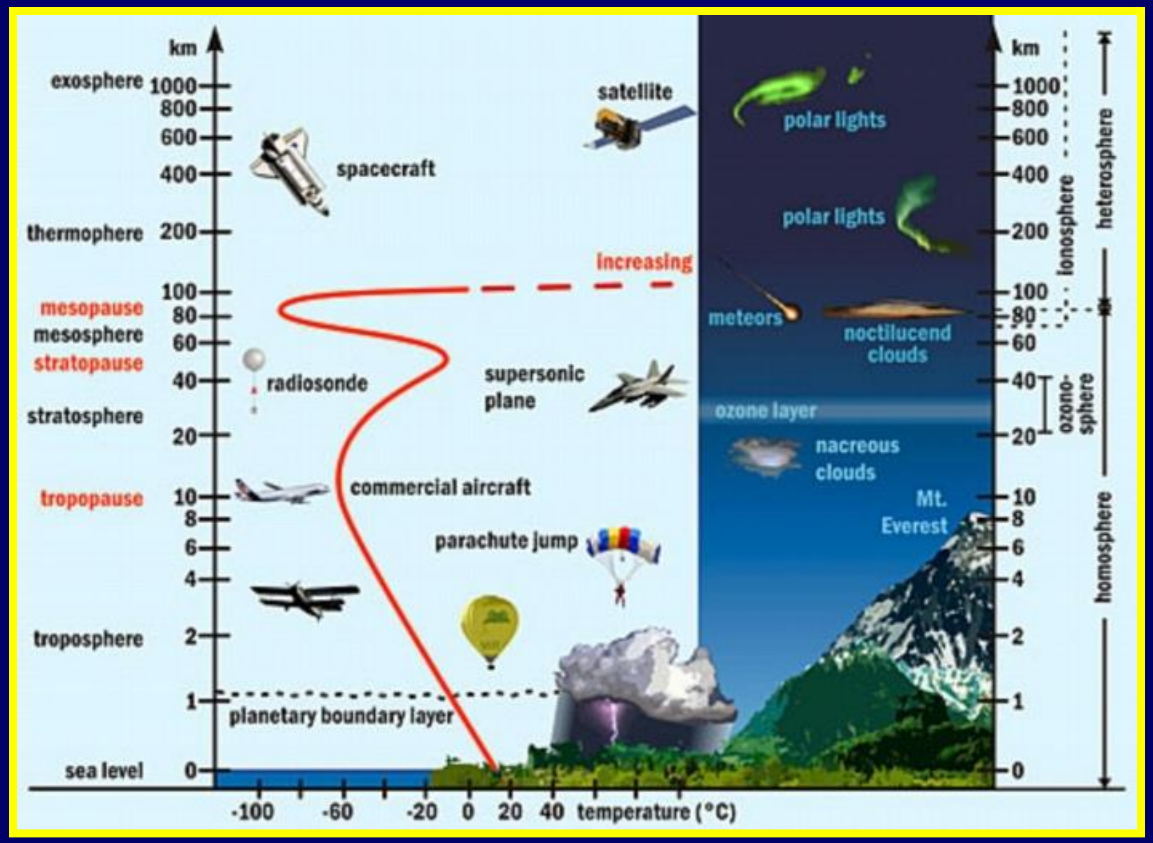
The troposphere is the layer closest to Earth's surface and contains most of the mass of the atmosphere as well as all of the water vapor.



All weather events occur in the troposphere.

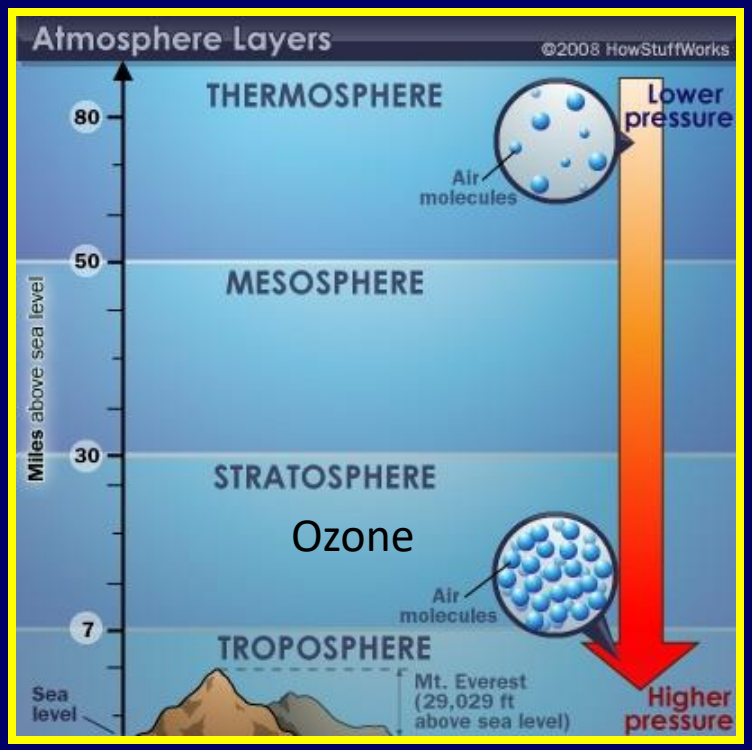
Troposphere

In the troposphere, the temperature and pressure decrease with height.



Stratosphere

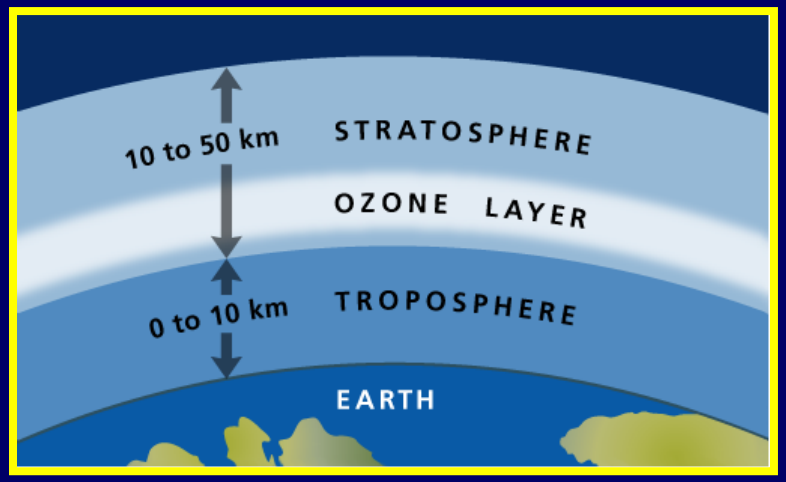
The stratosphere lies right above the troposphere and is where ozone gas is found.



Commercial planes often fly in this region to avoid bad weather.

Stratosphere

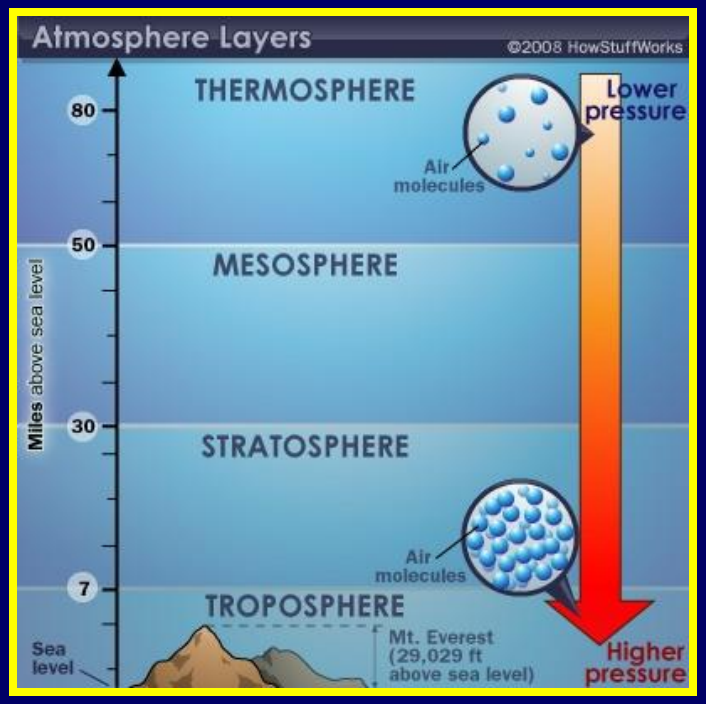
Ozone gas, made up of three oxygen atoms, collects and forms a layer in the stratosphere.



This layer of ozone blocks harmful ultraviolet radiation from reaching Earth.

Mesosphere

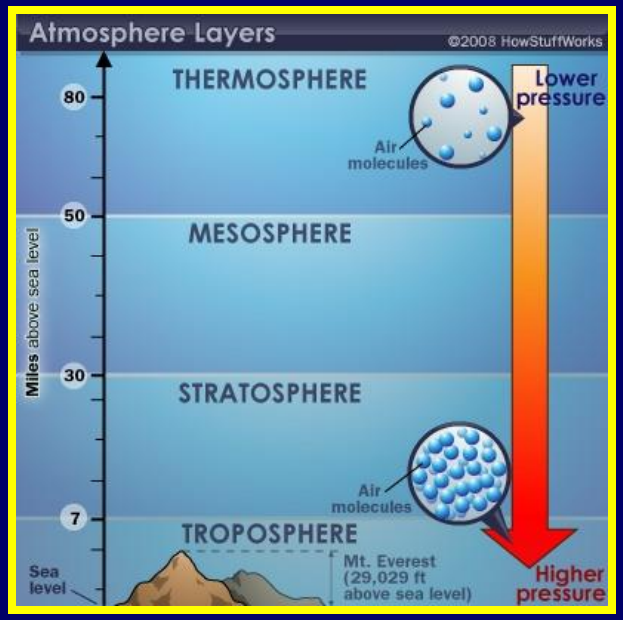
The mesosphere lies above the stratosphere and is the coldest layer with temperatures reaching -93^{0}C.



Most meteors collide with air particles here and burn up before they can reach Earth.

Thermosphere

The thermosphere lies above the mesosphere and is the warmest layer with temperatures reaching over $1000^{0}C$, due to the radiation from the Sun.



The thermosphere is where the auroras occur.

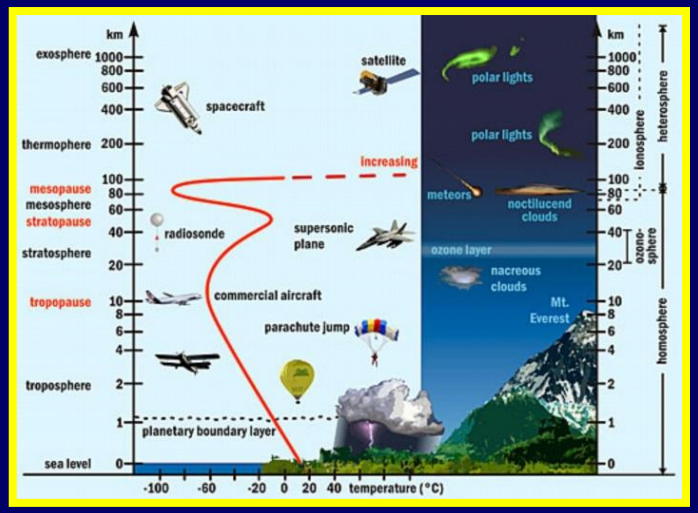
Auroras

Auroras result when charged particles from the Sun collide with nitrogen and oxygen gases in Earth's thermosphere, giving off light.

They are most easily seen around Earth's poles.

Exosphere

The exosphere is the outer-most layer of the atmosphere and contains a very small amount of atoms and molecules.



Satellites orbit here with little or no air resistance.

The End