Newsela

The Earth's Atmosphere: Layers around our planets

Published 09/19/2019 Word count:

The 6 layers of the atmosphere

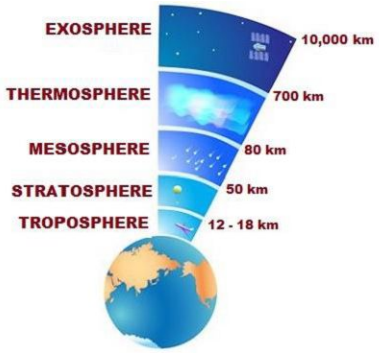
There are 6 different layers in our Earth's atmosphere. They are called the troposphere, stratosphere, mesosphere, thermosphere, ionosphere and exosphere. These different types of layers in our atmosphere have different and important qualities.

The layer closest to the Earth

Troposphere is the layer we live on and this layer also has the air we breath. It's where weather occurs. It's where clouds form, plains fly, Air balloons fly, birds fly, ect. "Tropos" means change. So the gases are constantly changing. The temperature in this layer decreases at a rate of 6.5 degrees per kilometer to the tropopause.

It's in the Troposphere

Tropopause is the area where the temperature remains constant between the troposphere and the stratosphere.



The second layer

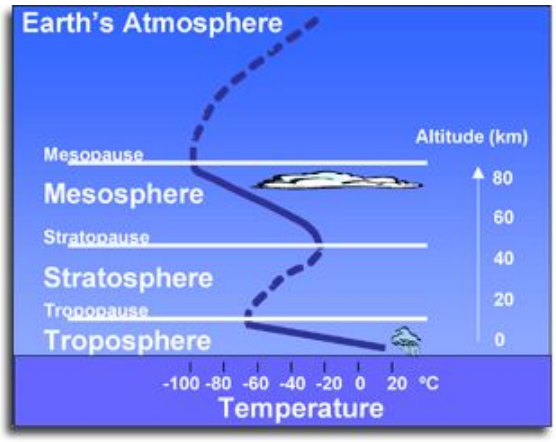
The third layer is the stratosphere. The stratosphere extends up to about 50km. The temperature ranges from -60 to 0 degrees celsius. So it it's getting warmer. The Stratosphere also has the jet streams. (high-speed winds) In this layer there are fewer particles. The stratosphere is where you will find the Ozone layer.

The Stratosphere includes the Ozone layer

The Stratosphere includes the Ozone layer. The ozone layer is were all the oxygen is stored. The Ozone layer is very important, because it shields the UV radiation. Without the Ozone layer the earth would absorb too much heat and sunlight. It is damaged by Fluoro-Hydro-carbons (FHCs) that are found in spray cans, automobile and airplane exhaust, etc.

Stratopause(NOT A LAYER)

The stratopause is the region between the stratosphere and mesosphere. The temperature in the Stratopause remains constant.



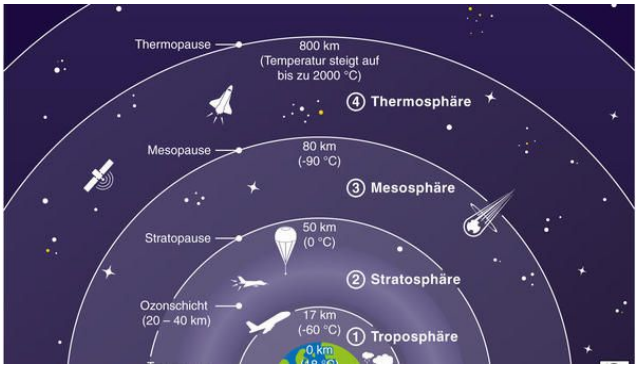
The coldest layer

The third layer is the mesosphere. "Meso" means middle. The Mesosphere extends to about 85 km. In the mesosphere, there is not enough air for people to breathe. The temperature ranges

from 0 to 100 degrees celsius.

In between Mesosphere and Thermosphere

The mesopause is the region between the mesosphere and thermosphere. And it is also where the temperature remains constant.



Layer, Layer, Layer

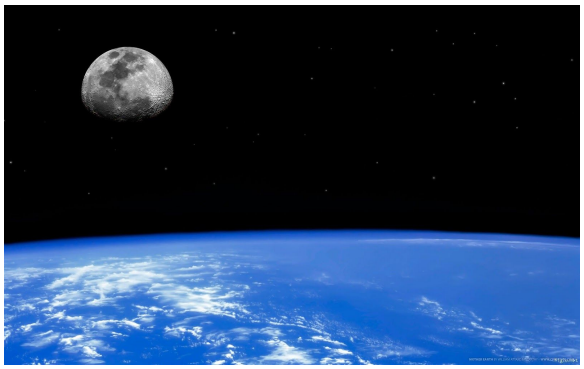
The fourth layer is called the Thermosphere. "Thermo" means heat. The thermosphere is the upper level of the atmosphere. It extends to about 500km. The temperature increases dramatically with an increase in elevation. And air is too thin to be measured.

Northern and southern lights

The fourth layer is called the Ionosphere. The Ionosphere contains particles called ions. Low frequency radio waves bounce off of it and return to Earth. It is responsible for the Aurora Borealis and Australis (Northern and Southern lights).

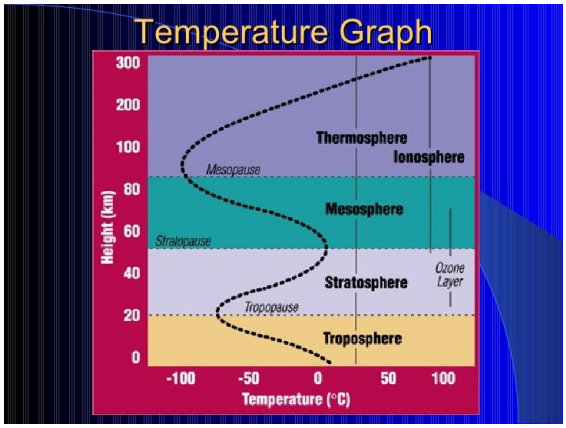
The coldest layer

The exosphere is the last layer in the atmosphere. "Exo" means outside. That is why the exosphere is known as the upper part. It blends with the complete vacuum of space. It is also very cold. And there's no air to breath.



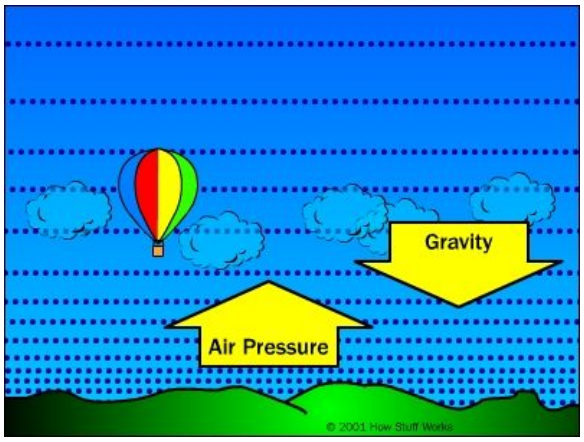
Temperature

Temperatures cool air is heavier than warm air (“hot air rises”). Because particles are so far apart in the thermosphere, it is very difficult to measure the temperature in the upper regions of it.



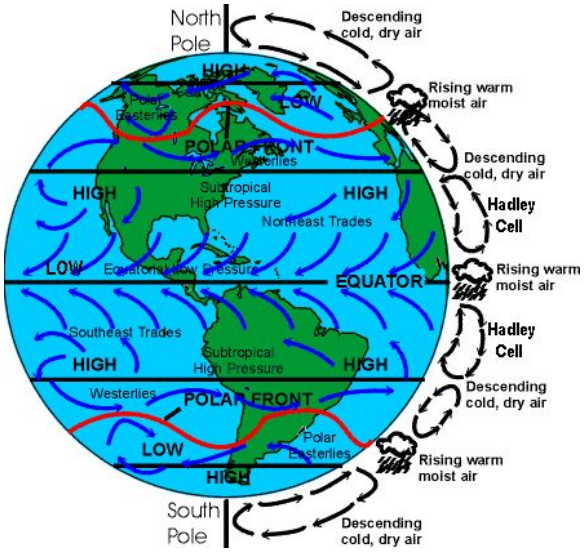
Air Pressure

Atmospheric pressure is the ratio of the weight of the air to the area on which it presses. Standard air pressure at sea level will push a column of mercury 760 millimeters up a vacuum tube or 29.92 inches. Millibar is what official weather maps use to measure air pressure. One millibar = .001 of standard atmospheric pressure. At sea level, standard atmospheric pressure is 1013.2 millibars.



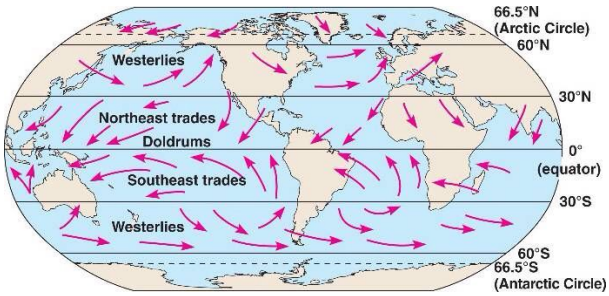
Global Winds

Cells of air that circulate or above the Earth’s surface. Caused by variations in temperature and humidity. Winds that blow from 30 degrees to 90 degrees along the Earth's surface and are affected by the coriolis effect.



Local Winds

There are 3 local winds they are Sea breeze, Land breeze, and mountain breeze. Sea breeze is during the day, the land heats faster than the ocean creating low pressure over the land and high pressure over over the water. Land breeze is at night, the land loses heat faster that the ocean creating high pressure over the land. The Mountain breeze is during the day, warm air rises up the mountain slopes, cooling and condensing the moisture. At night, the cooler air, dry air blows down the mountain to the valleys below.



Quiz

1. What does the Ozone Layer shield?
2. What does “Exo” mean?
3. Which layer do we live on?

-Thermosphere

-Exosphere

-Troposphere

-Mesosphere

4. When does a Land breeze occur?
   - During the day
   - During the night

Quiz Answer

1. What does the Ozone Layer shield?

   The ozone layer shields the UV radiation

2. What does “Exo” mean?
   "Exo" means outside.

3. Which layer do we live on?

-Thermosphere

-Exosphere

-Troposphere

-Mesosphere

4. When does a Land breeze occur?
   - During the day
   - During the night