Layers of the Atmosphere

Layers of the Atmosphere

- The ***atmosphere*** is the layer of gases that surrounds the planet and makes conditions on Earth suitable for living things.

Layers of the Atmosphere

- Earth's atmosphere is divided into several different ***atmospheric layers*** extending from Earth's surface outward.

Layers of the Atmosphere

- The ***troposphere*** is where all the weather occurs.

- It is the closest layer to Earth's surface.

- It is the layer we live in.

Layers of the Atmosphere

- The stratosphere is located directly above the troposphere.
- This is where the ozone layer is.

Layers of the Atmosphere

- The next layer up is the ***mesosphere***, followed by the ***thermosphere***, and then the ***exosphere***.

Layers of the Atmosphere

Space

Exosphere

Thermosphere

Mesosphere

Stratosphere (Ozone Layer)

Troposphere (Weather, Life)

Earth's Surface

Atmospheric Gases

Nitrogen & Oxygen

- These are the two most common gases found in the atmosphere.
- They can be found throughout all the layers.

Atmospheric Gases

Ozone

- Ozone is a form of oxygen
- It is only found in the stratosphere

Atmospheric Gases

Water Vapor & Carbon Dioxide (CO_2)

- These are important gases for weather conditions.
- They are found in the troposphere where weather occurs.

Atmospheric Gases

Trace Gases

- These gases are unimportant and found in small amounts throughout the layers of the atmosphere.
- Example: argon

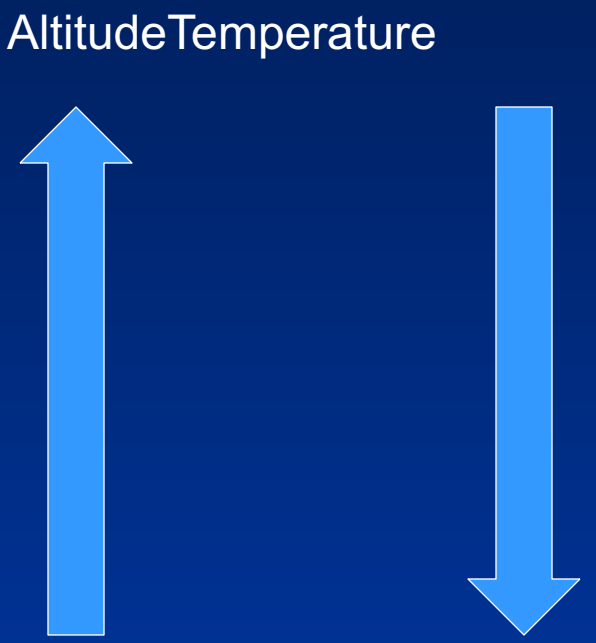
Atmospheric Temperatures

Differences in temperature are what separate each layer in the atmosphere from the one above and/or below it.

Atmospheric Temperatures

In the troposphere:

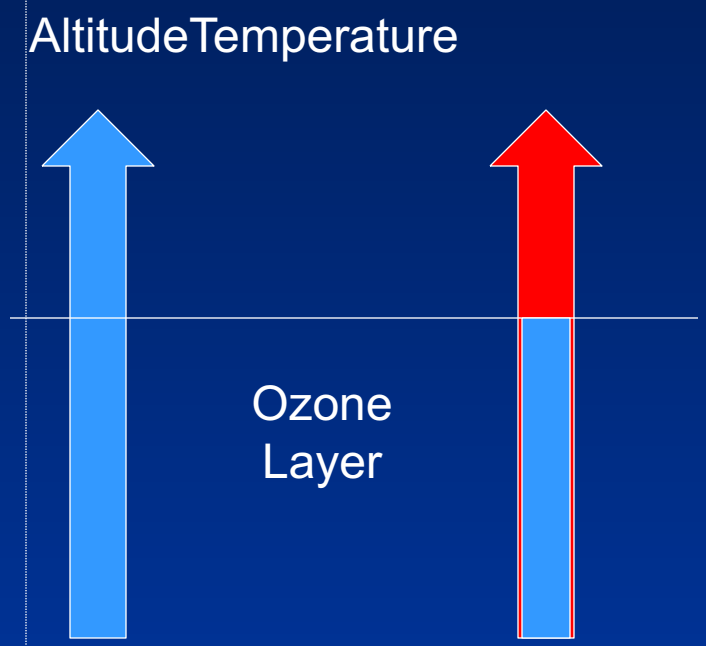
- As altitude increases, temperature decreases



Atmospheric Temperatures

In the stratosphere:

- The stratosphere is cold except in its upper region where ozone is located.




OZONE LAYER
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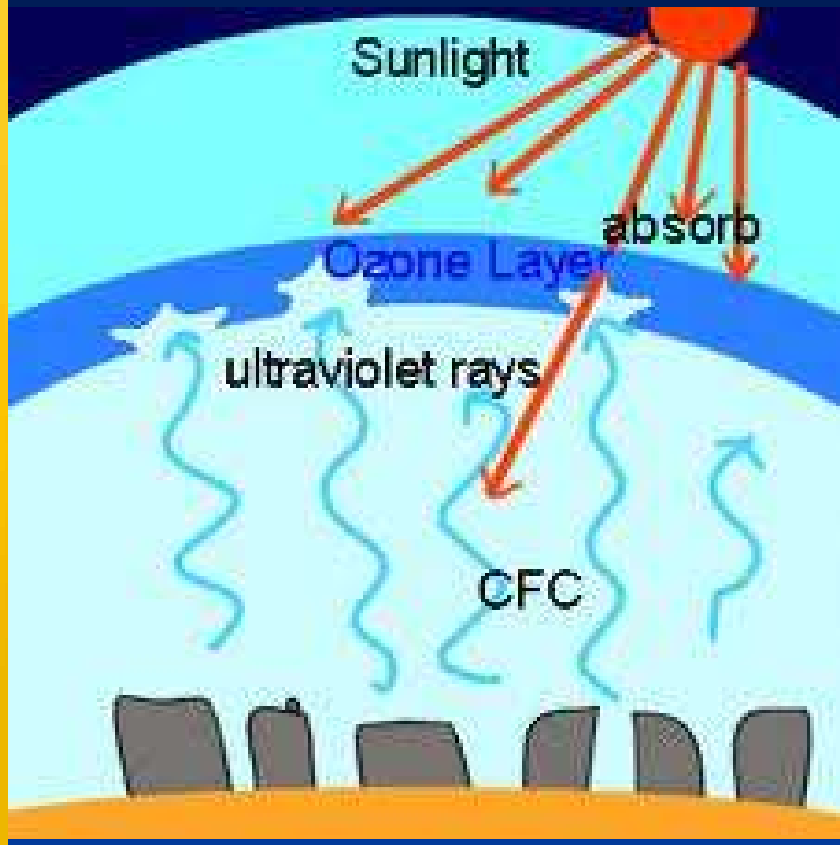
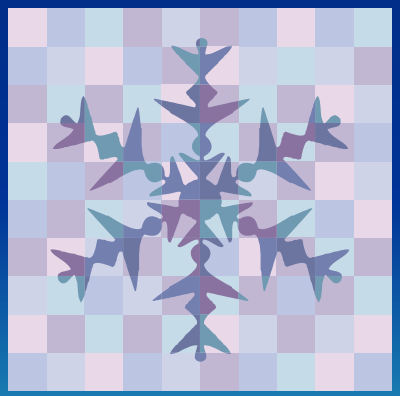
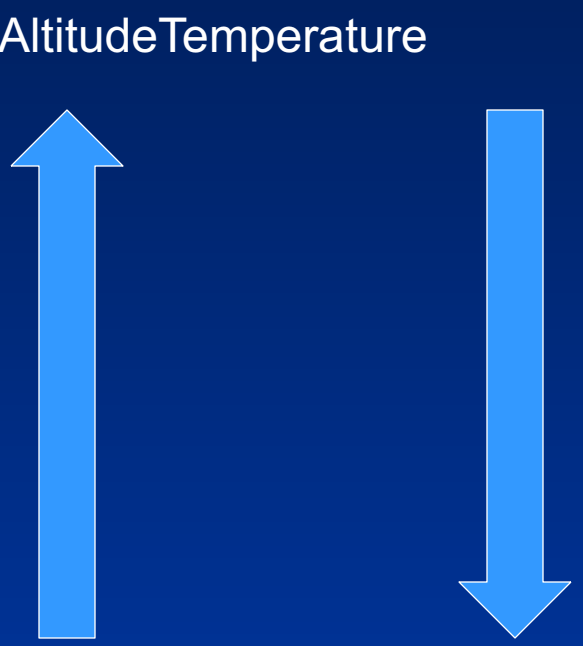

Sunlight
absorb
Ozone Layer
ultraviolet rays
CFC

Atmospheric Temperatures

In the Mesosphere:

- This is the COLDEST layer in the atmosphere.

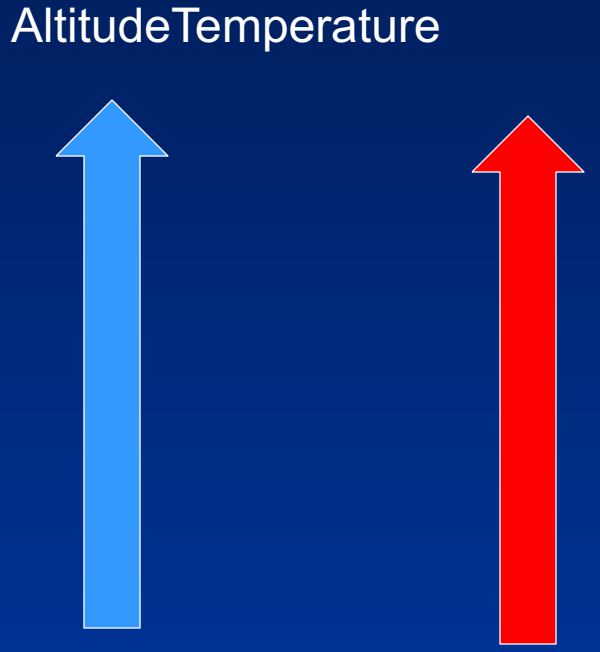




Atmospheric Temperatures

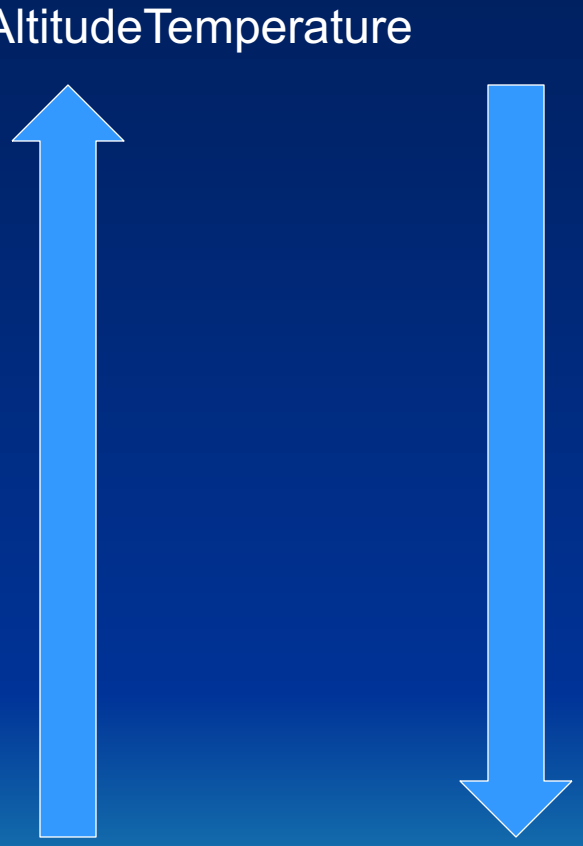
In the thermosphere:

- Even though the air is thin in the thermosphere, it is very HOT.



Atmospheric Temperatures

Beyond the thermosphere is the exosphere which leads into outer space where it is very cold, because there is little to no atmosphere to absorb the Sun's heat energy.



Atmospheric Temperatures

Temperature Altitude

Outer Space

Exosphere

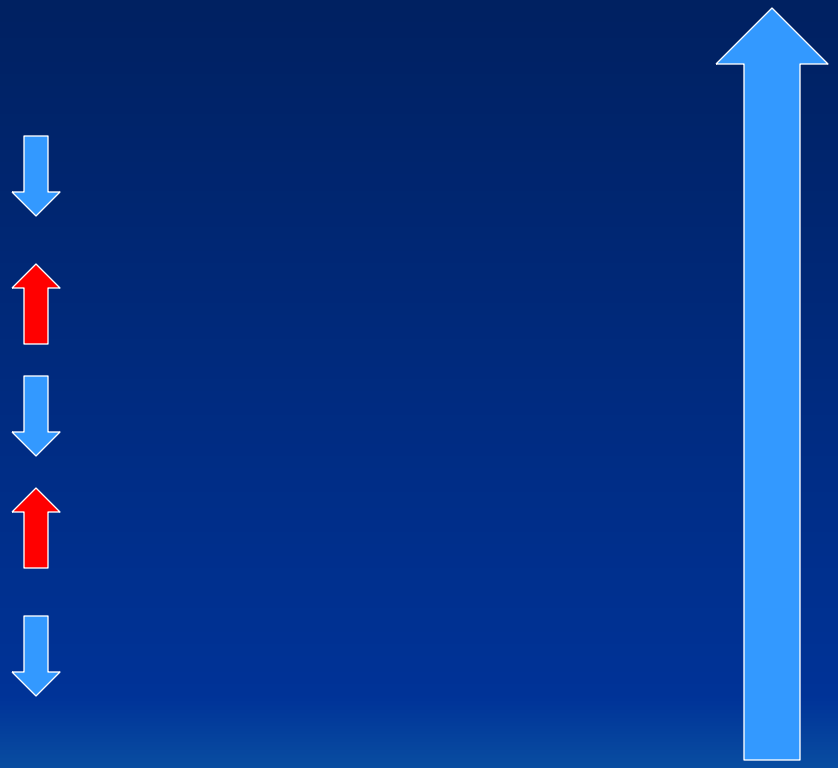
Thermosphere

Mesosphere

Stratosphere

Troposphere

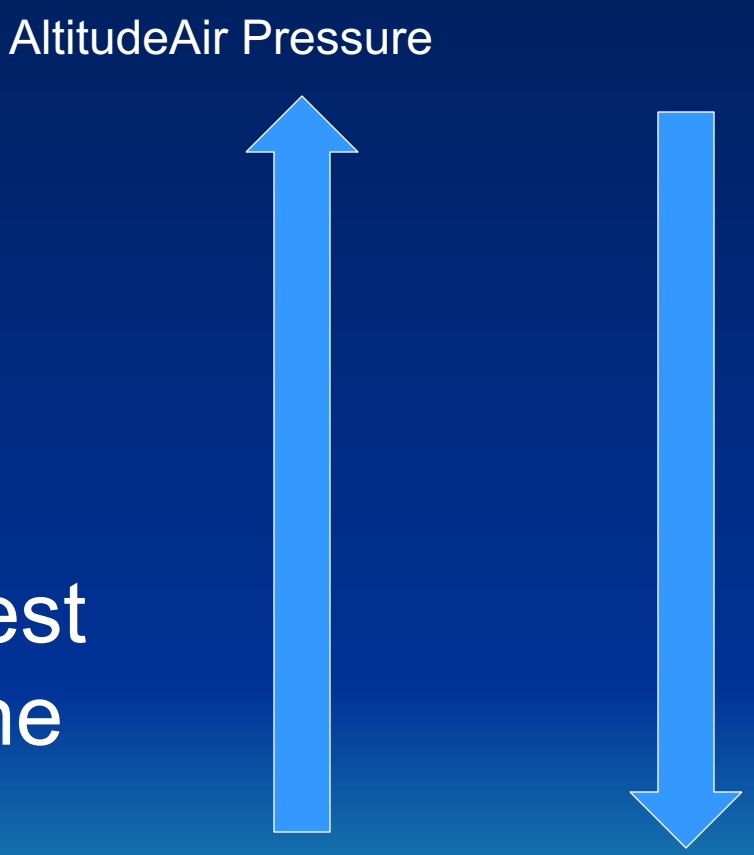
Earth's Surface



Atmospheric Pressure

- ***Air pressure*** is the force exerted by the gases pushing on an object.

- Air pressure is greatest near the surface of the Earth in the troposphere.

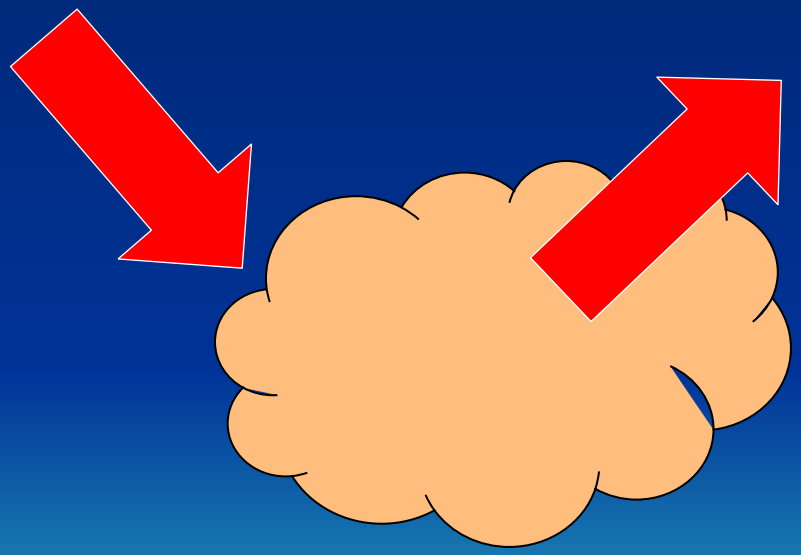


Solar Energy

- Energy from the Sun is known as Solar Energy.
- Solar energy is the driving energy source for heating Earth, and circulation in Earth's atmosphere.

Solar Energy

- Some of the Sun's energy coming through Earth's atmosphere is reflected by gases and/or clouds in the atmosphere.



Solar Energy

- The land heats up and releases its heat fairly quickly.
- Water needs to absorb lots of solar energy to warm up.
- It is the water on Earth that helps to regulate the temperature range of Earth's atmosphere.

Solar Energy

- Solar energy that is absorbed by Earth's land and water surfaces is changed to heat that moves/radiates back into the atmosphere (troposphere) where the heat cannot be transmitted through the atmosphere so it is trapped, a process known as the ***greenhouse effect***.