

# Weather

Concept 1. What are Characteristics of  
the atmosphere

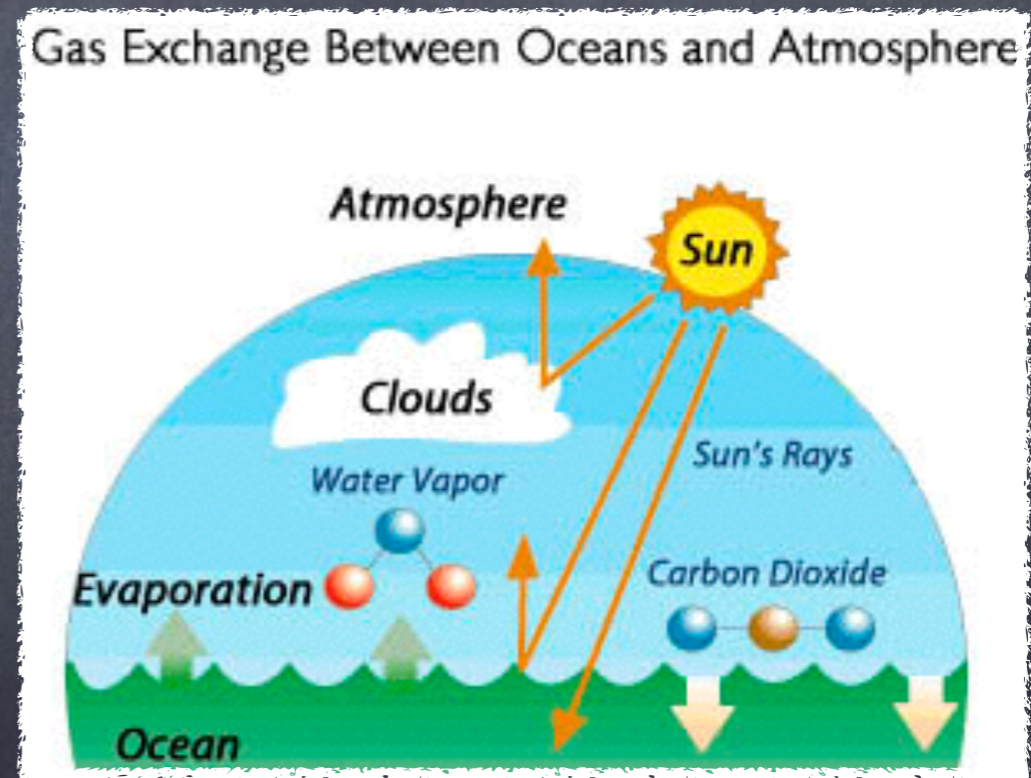
# What is the atmosphere?

- Definition: The atmosphere is a thin layer of gases surrounding Earth.



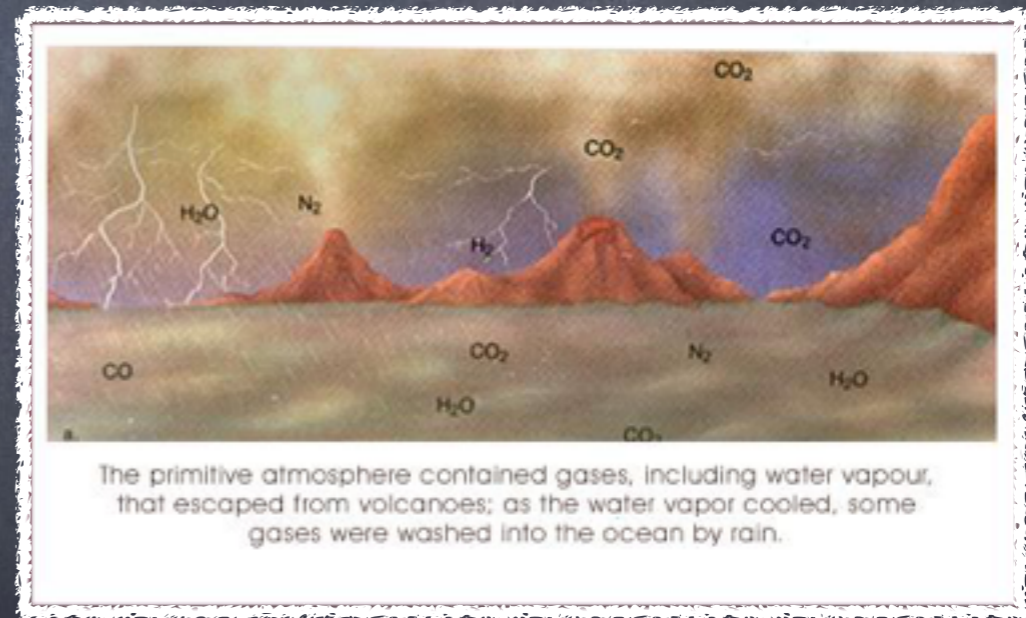
# Why is the atmosphere important?

- The atmosphere contains the oxygen, carbon dioxide, and water necessary for life.
- The atmosphere acts like insulation, it help keeps temperatures within range to support life.
- It also helps protect against radiation rays.



# What are the origins of the Earth's Atmosphere?

- As the earth and atmosphere cooled, water vapor condensed into liquid.
- Early life replaced carbon dioxide in the atmosphere with oxygen through photosynthesis.



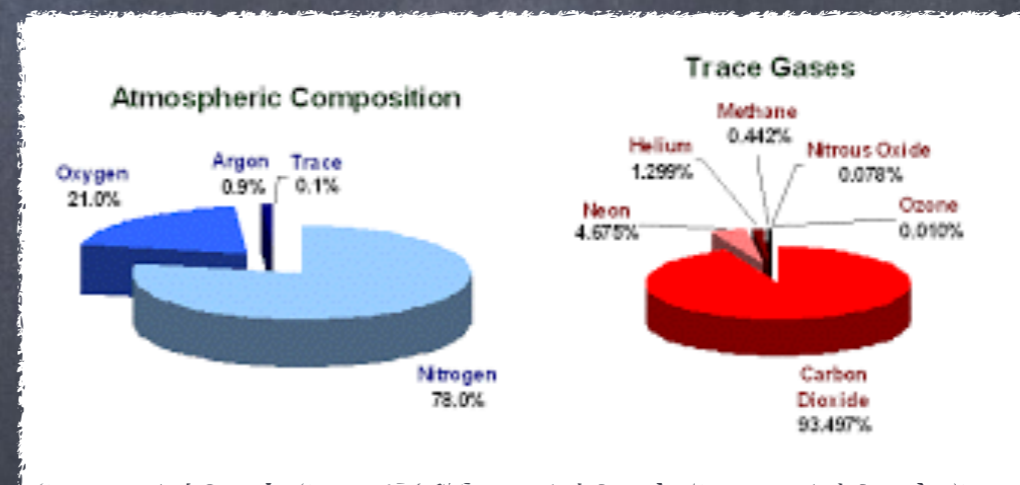
# What is water vapor?

- Definition: Water in its gaseous form.



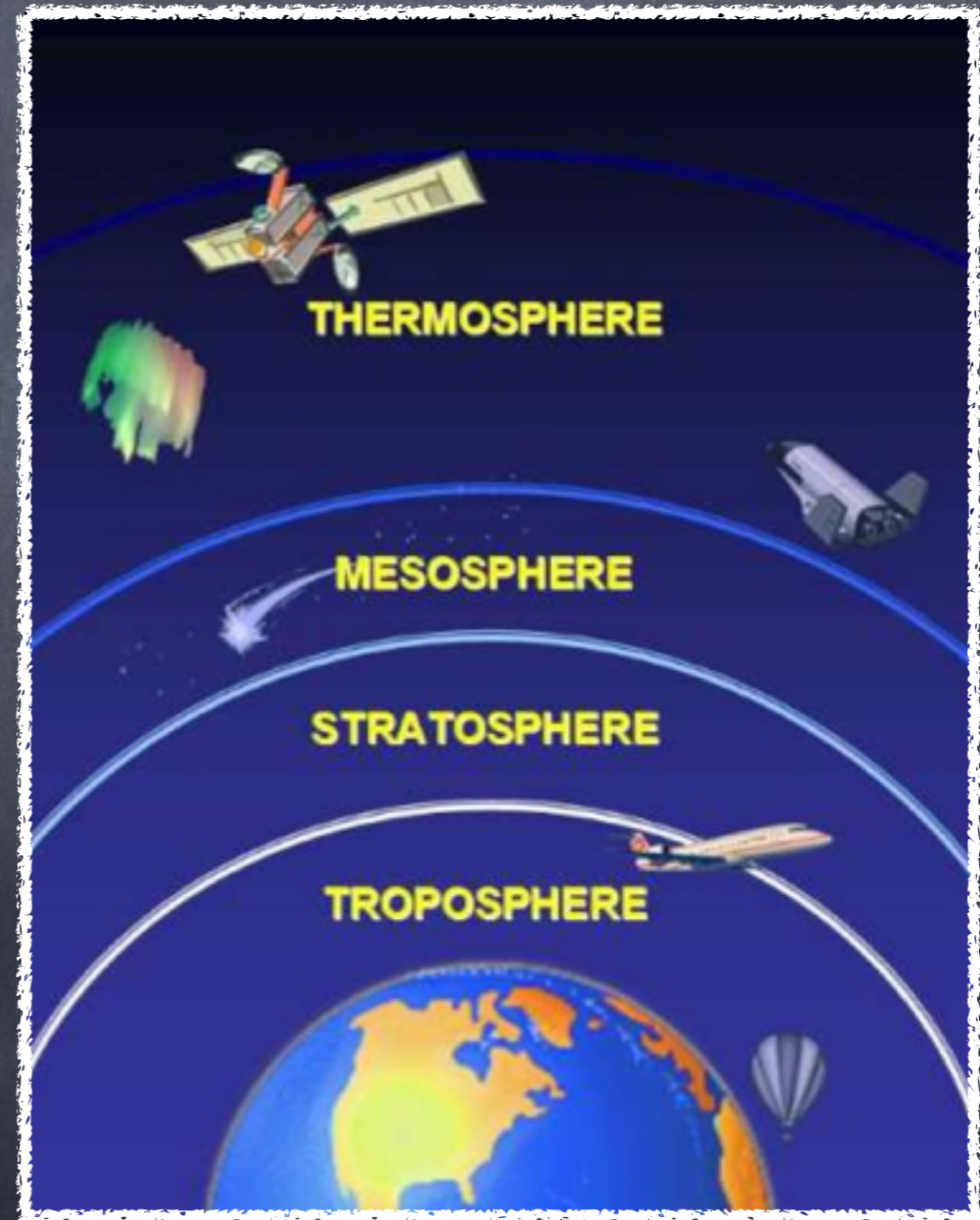
# What is the Composition of the Atmosphere?

- The atmosphere is a mixture of gases that surrounds the earth.
- Nitrogen composes 78%, Oxygen 21%, and 1% is Carbon Dioxide, Argon, Water Vapor, and other gases.
- The atmosphere contains liquids (Clouds) and solids (Smoke, ash, dust).



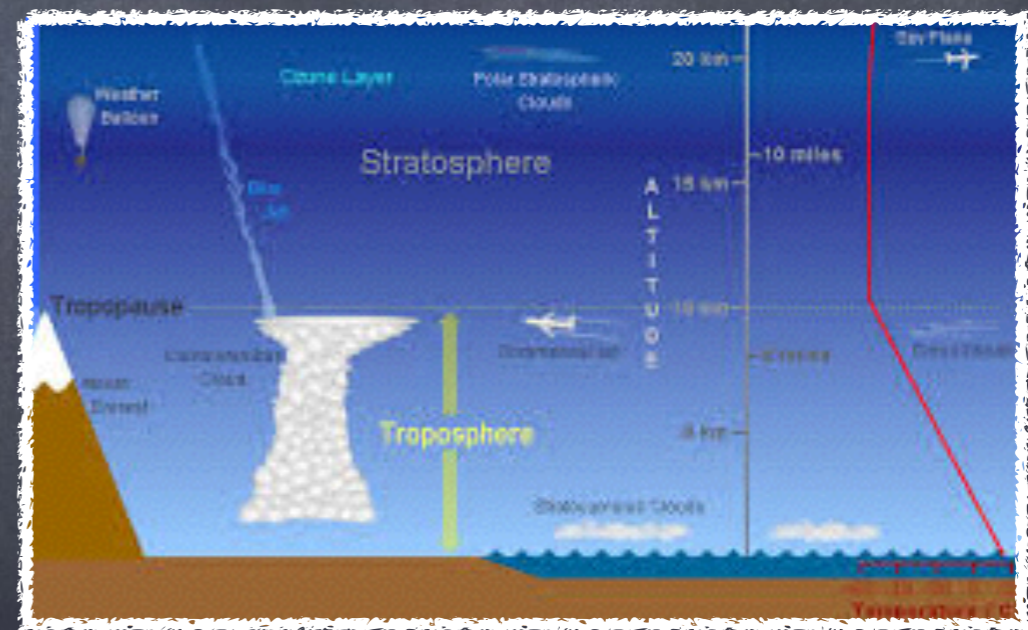
# What are the Layers of the atmosphere?

- The atmosphere is composed of 4 distinct layers. Troposphere, Stratosphere, Mesosphere, and Thermosphere



# What is the Troposphere?

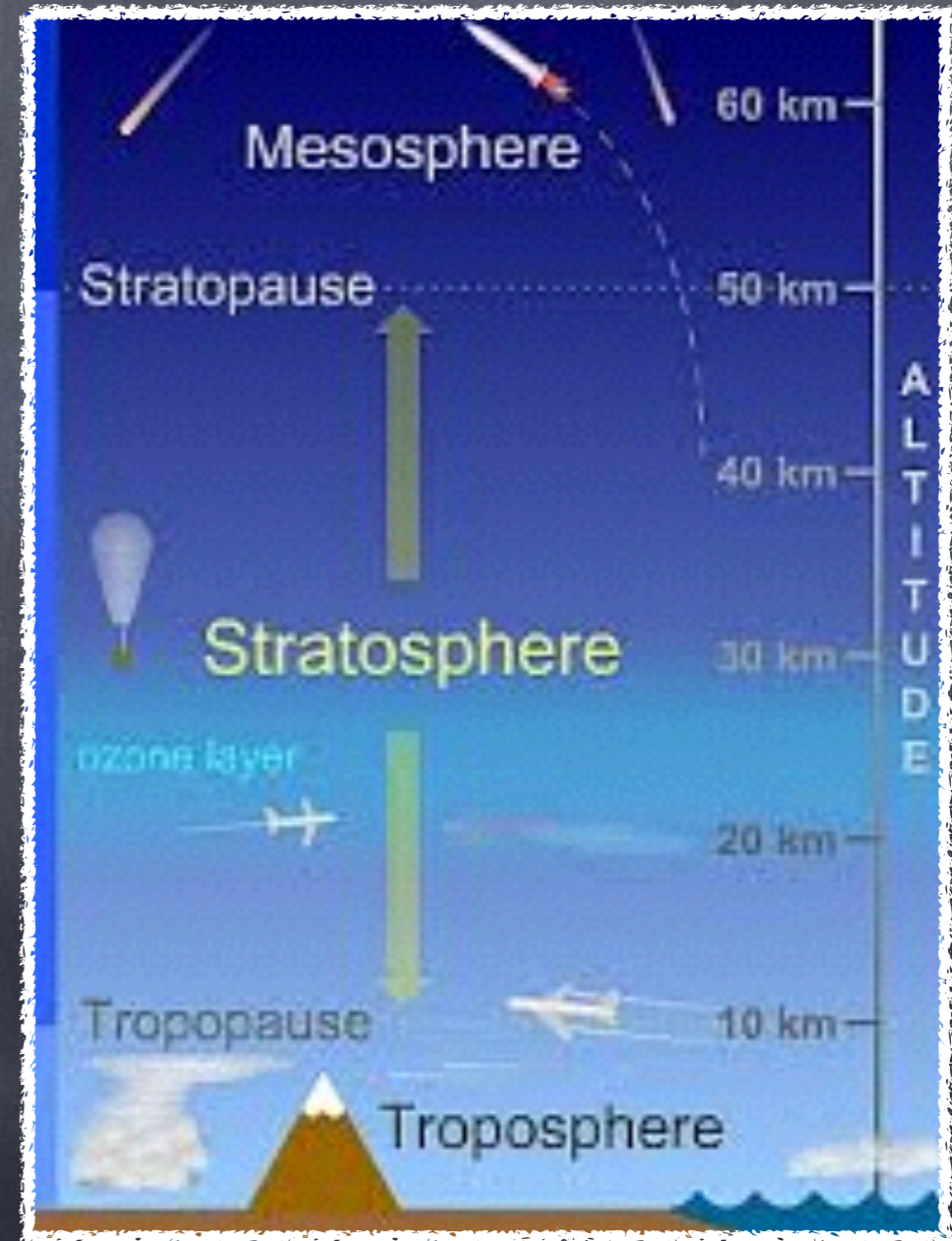
- Definition: the atmospheric layer closest to Earth's atmosphere. The temperature decreases as you move away from the earth. The heat that radiates through the troposphere causes weather.





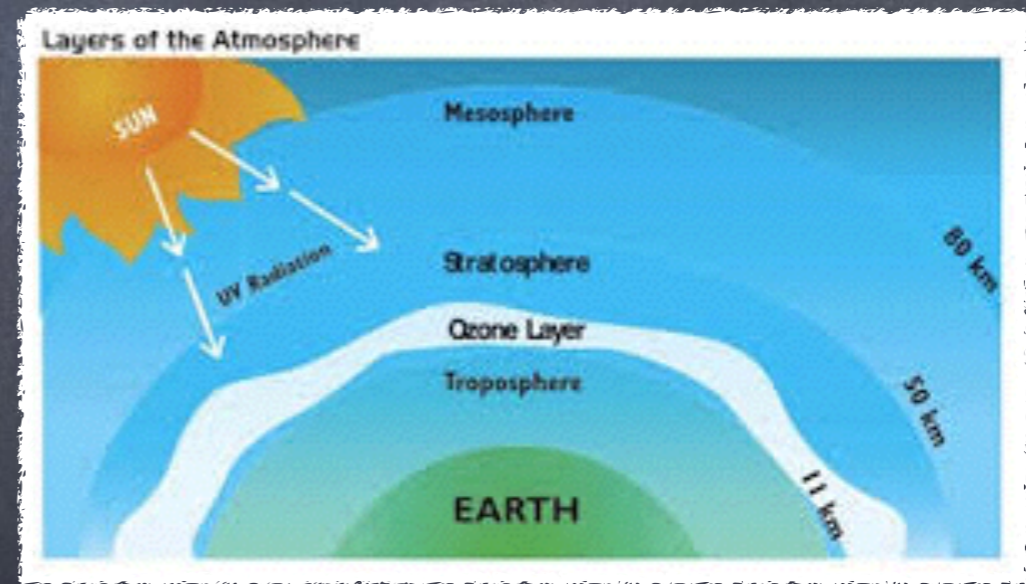
# What is the Stratosphere?

- Definition: The atmospheric layer above the troposphere. The upper half contains a high concentration of ozone gas. Stratosphere temperatures increase with altitude.



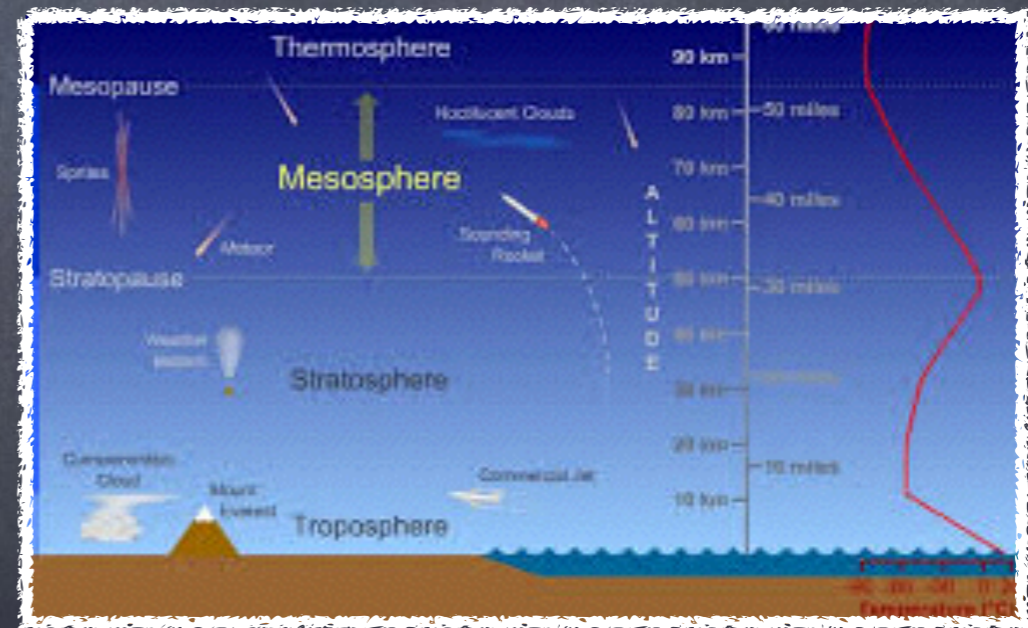
# What is the Ozone Layer?

- The upper half contains a thin layer of Ozone. Ozone is made up of 3 oxygen molecules. It absorbs solar energy in the form of UV radiation. This makes the ozone layer warmer and also protects us from harmful radiation.



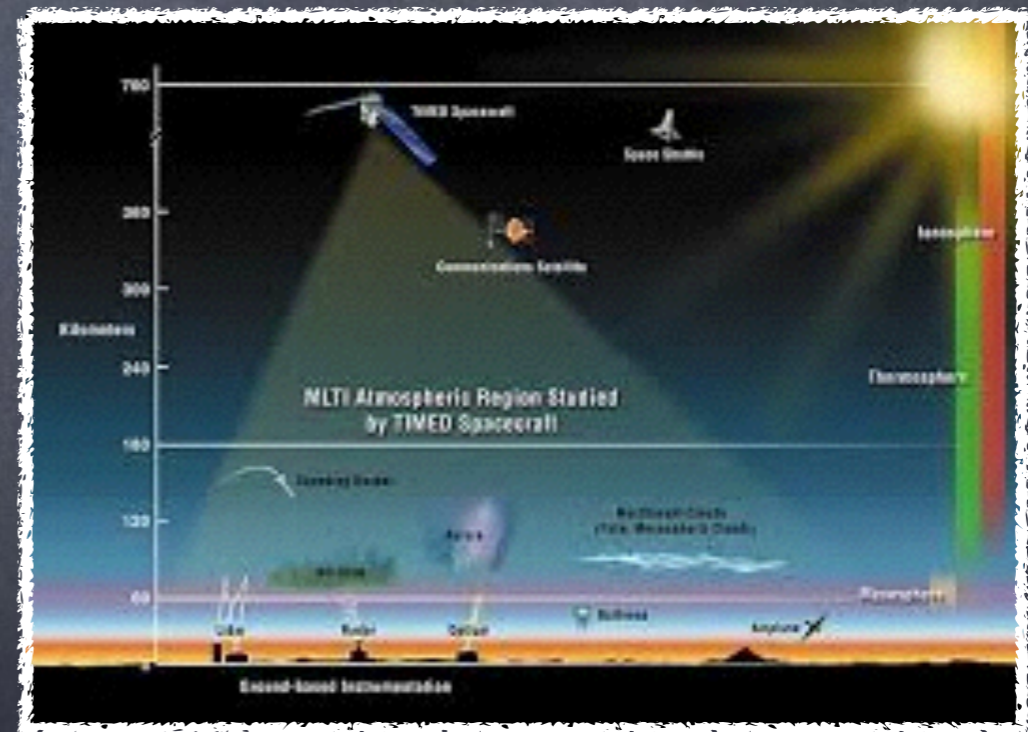
# What is the Mesosphere?

- The 3rd layer, between 30 and 50 miles above the Earth's surface. The coldest layer and windiest layer. Wind speeds can reach 200 mph.



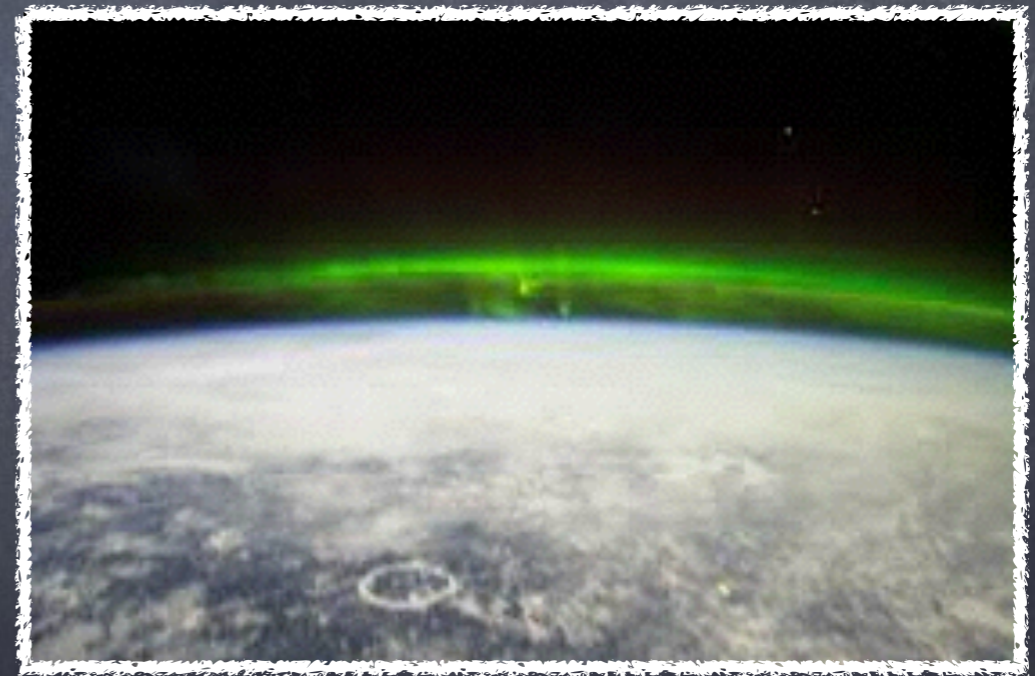
# What is the Thermosphere

- The uppermost layer, sometimes referred to as the exosphere. Forms the boundary between space. High temperature, but very low heat energy.



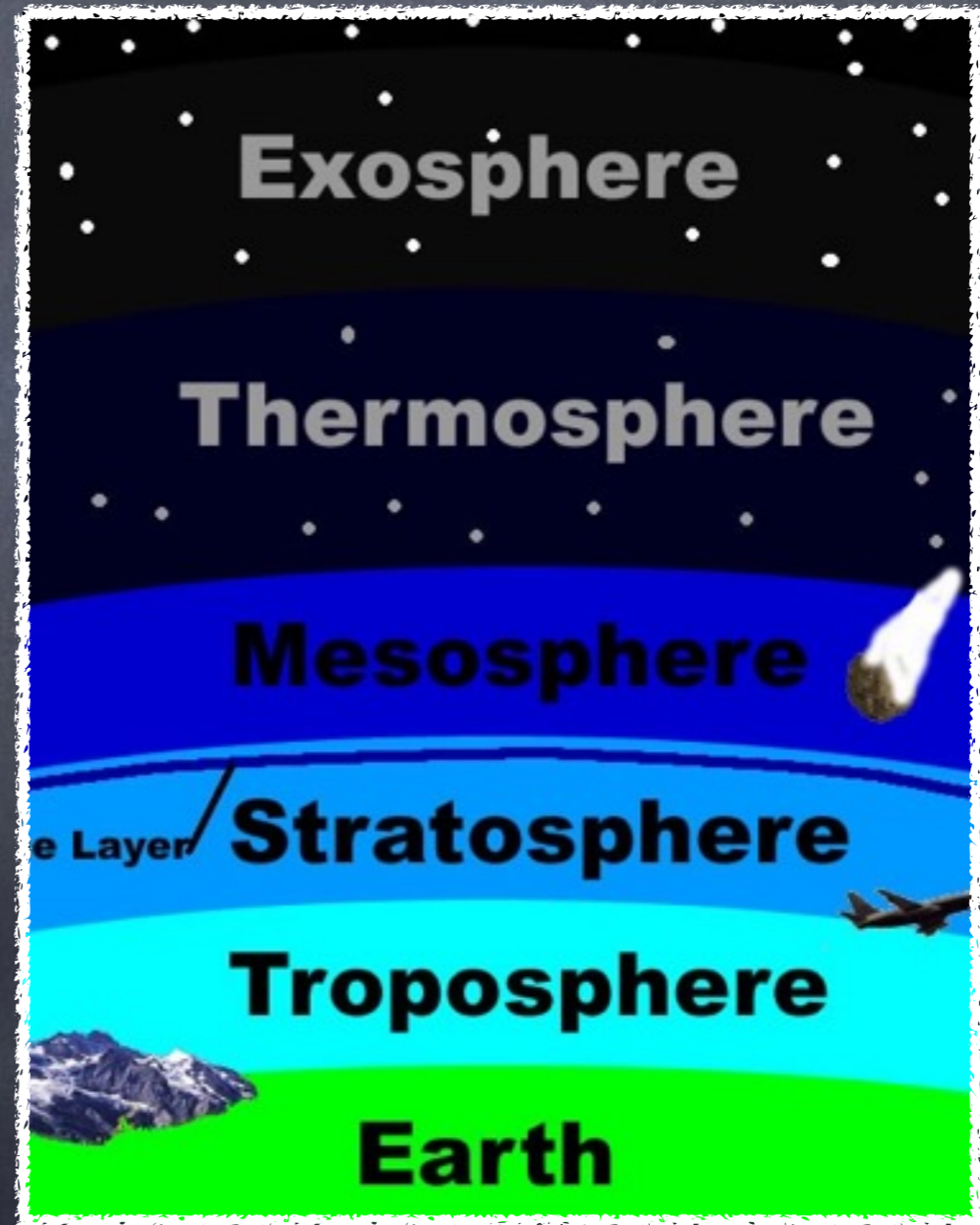
# What is the Ionosphere?

- Definition: A region within the mesosphere and thermosphere that contains ions. Auroras take place in the ionosphere.



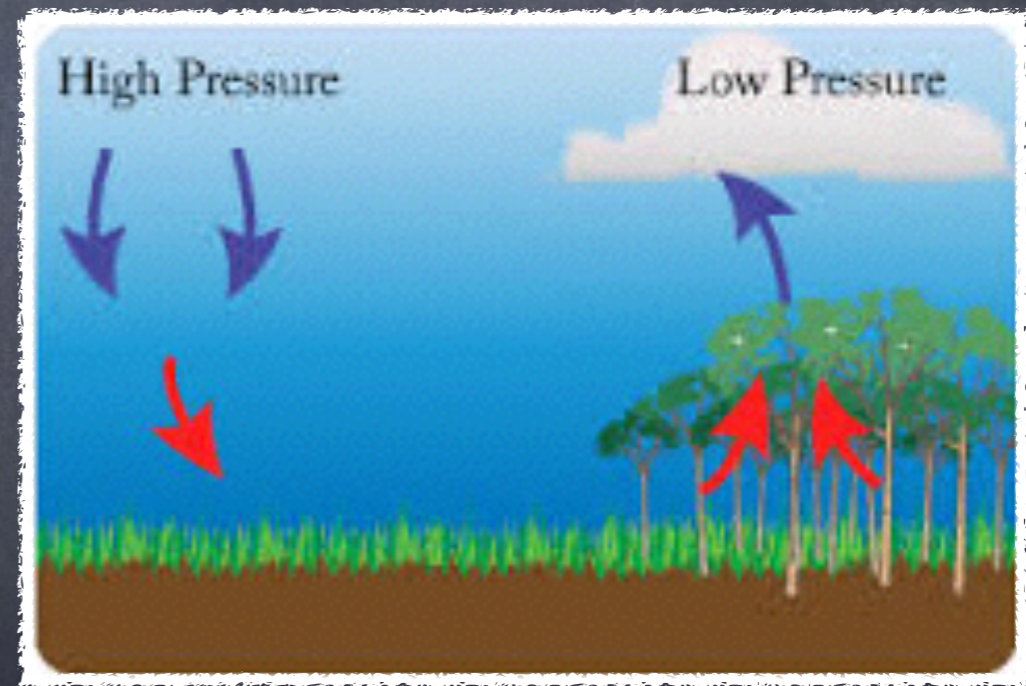
# Exosphere

- Farthest layers from Earth's surface
- Pressure and density are so low that individual gas molecules rarely strike one another



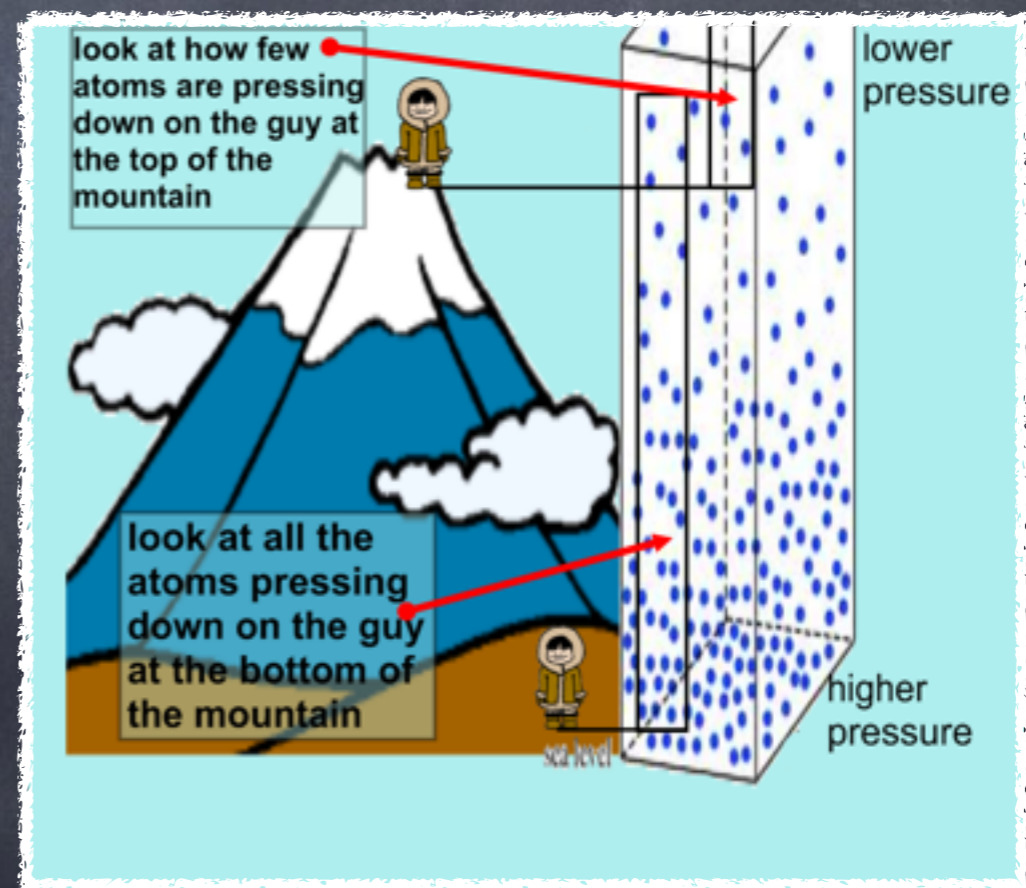
# What is Air Pressure

- The measure of the force which the air molecules push down on a surface.
- Examples
- Human pyramid: more people on the bottom, fewer on top. People on the bottom have more weight on them than the people on top.
- You have 14.7 lbs of air pressing on every square inch of your body.



# How are Air pressure and Altitude related?

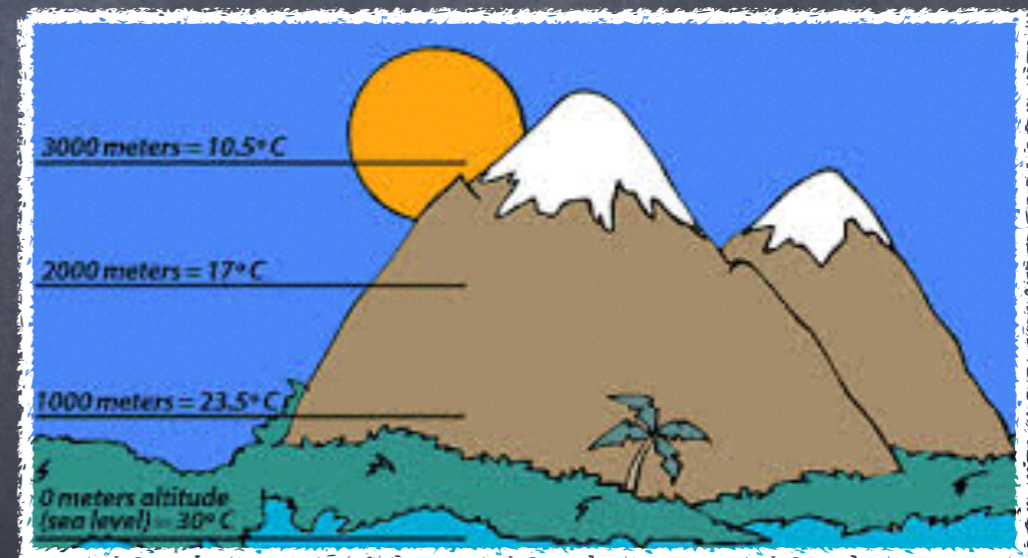
- As altitude increases, air pressure decreases. There are fewer gas molecules pushing down at higher altitudes.
- Altitude is the height above the Earth's surface.





# How are Air Temperature and Altitude Related?

- As altitude increases, temperature varies. Some layers have gases which absorb more thermal energy than others, such as the ozone layer.



# Let's Review!

- 1. \_\_\_\_\_ is a thin layer of gases surrounding Earth.
- 2. the area of the stratosphere that helps protect Earth's Surface from harmful ultraviolet rays is the\_\_\_\_\_.
- 3. Define Water vapor.
- 4. Which atmospheric layer is closest to Earth?
- 5. Identify two atmospheric layers in which temperature decreases as altitude increases.
- 6. How is present day atmosphere compositions different from Early Earth's?
- 7. Explain three ways the atmosphere is important to life on Earth.