



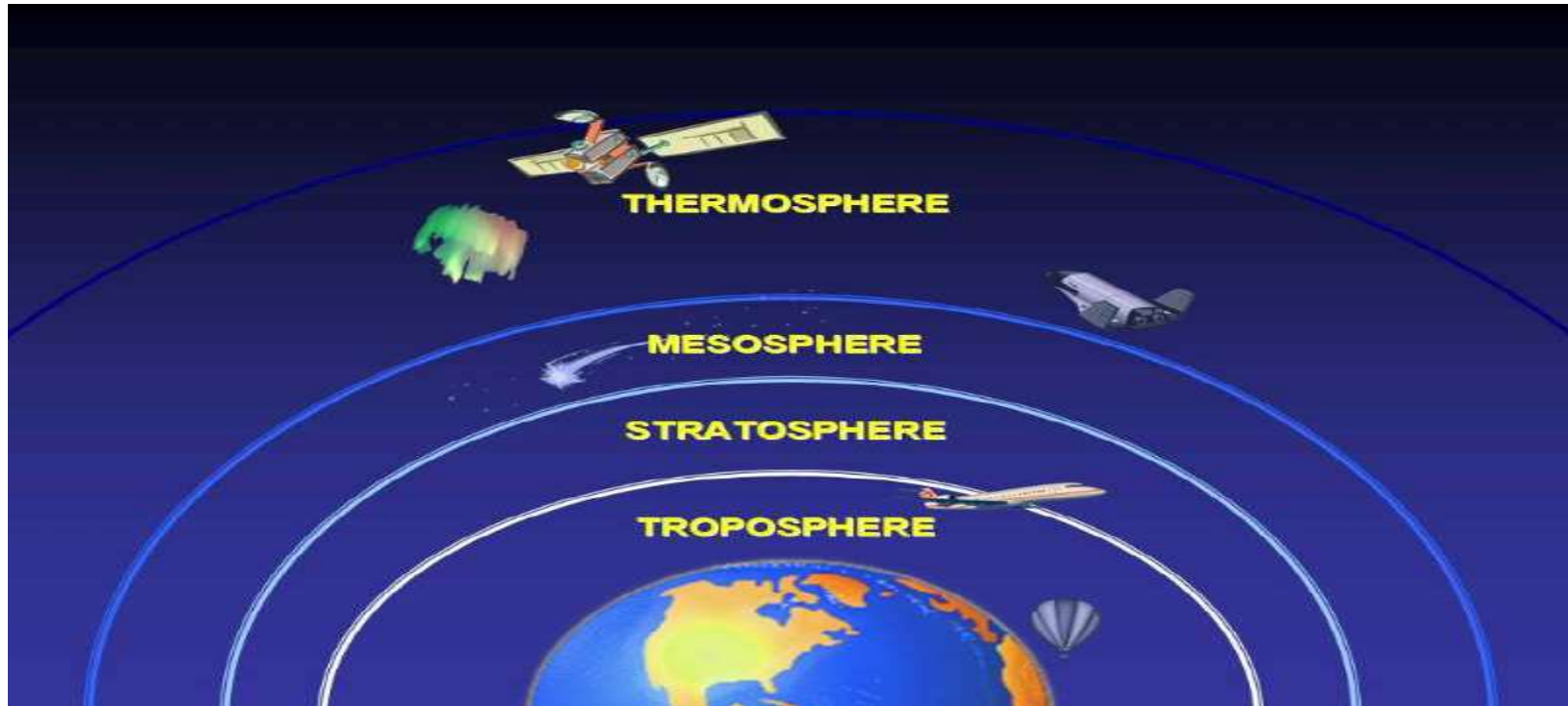
Earth's Atmosphere

WHAT IS THE EARTH'S ATMOSPHERE?

A thin layer of air that forms a protective covering around the planet.

A envelope of gases that surround the planet.

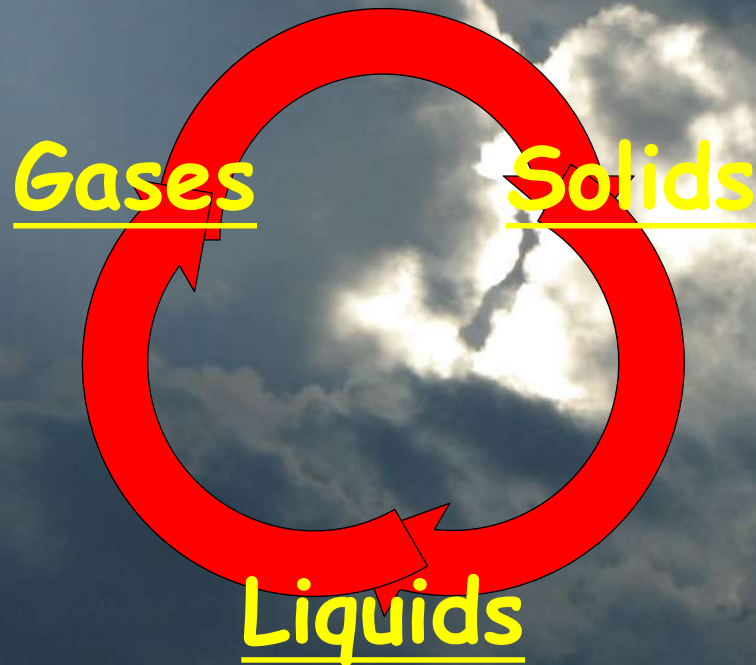
Where is it found?



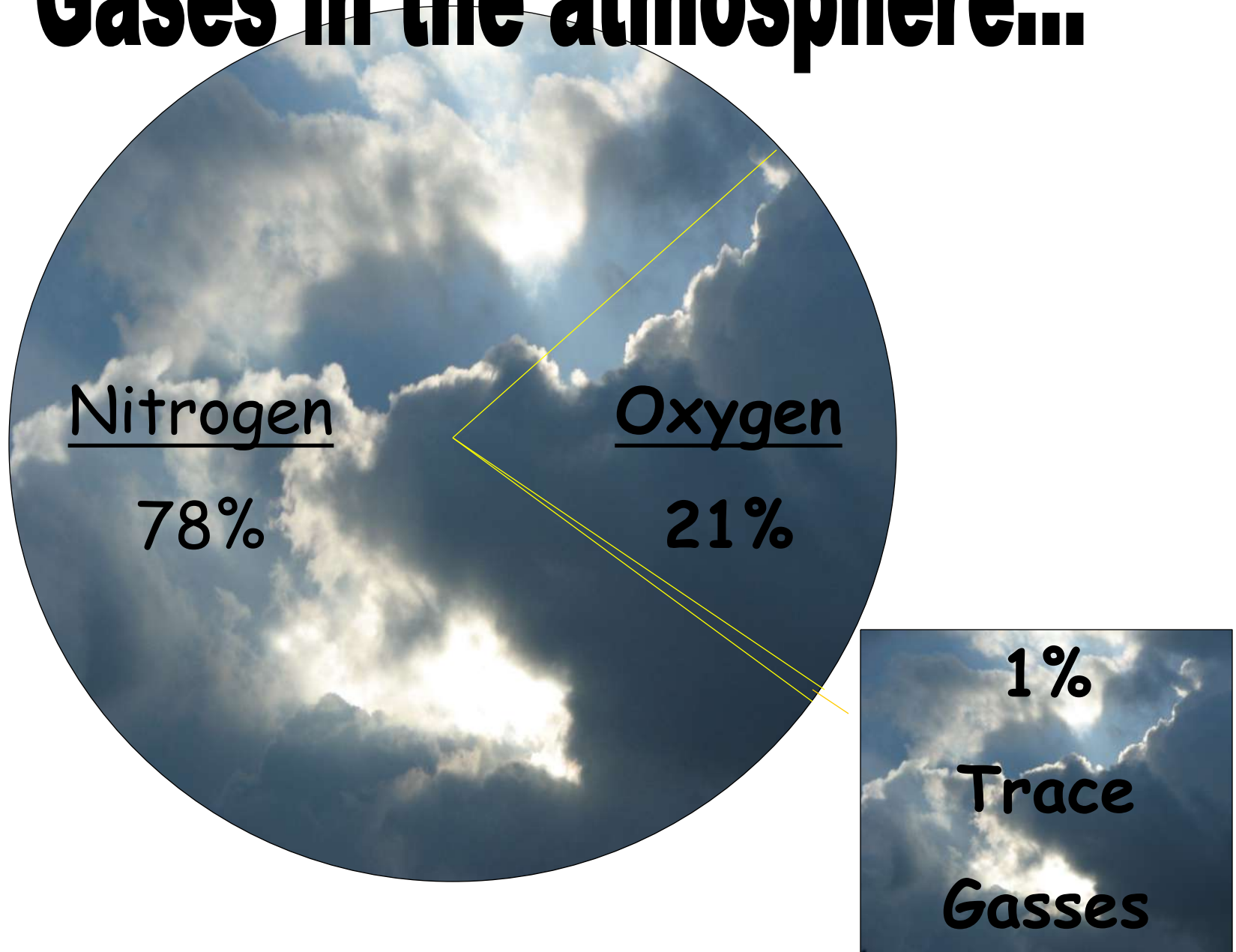
- It begins Earth's surface and ends in outer space.

What makes up the
Atmosphere?

What makes up the atmosphere?



Gases in the atmosphere...



Water Vapor

- Gas
- Invisible
- not the same as steam

Liquids in the Atmosphere

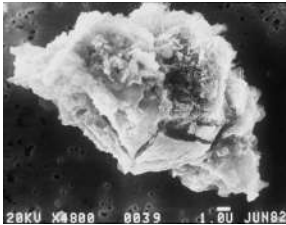
- What type of liquids are in the atmosphere?

Liquid droplets other than the water in clouds

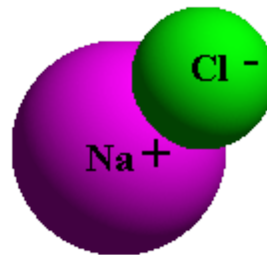
- Where do they come from?

When a volcano erupts, liquids are released.
For example, Sulfuric Acid can produce spectacular sunsets.

Other particles that are in the atmosphere



Dust



Salt

Salt



Pollen

How do solids get into the Atmosphere?

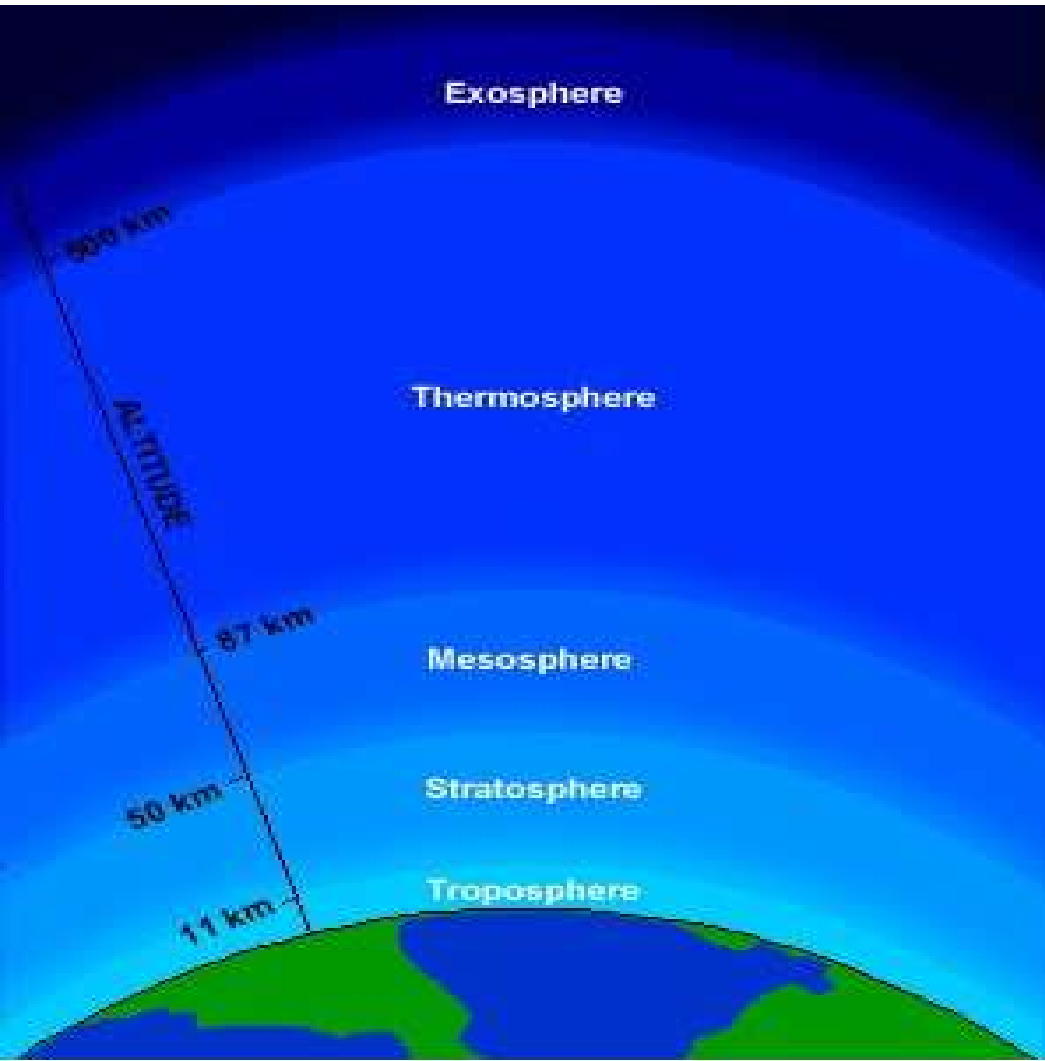
- Dust—dead skin & pollutants that wind picks up and carries it along
- Salt—evaporation from the ocean
- Pollen—trees & flowers as they bloom in spring
- Smoke—burning substances

Why is the atmosphere so important to us?

- Contains Oxygen & other gases need for survival
- Helps maintain a balance between the amount of heat absorbed from the Sun and the amount of heat that escapes back into space. The days would be extremely hot, and the nights would be extremely cold.
- Traps heat to keep water in a liquid
- Protects life-forms from some of the Sun's harmful rays.

Layers of the Atmosphere

How many layers are there in the Earth's atmosphere?



The atmosphere is made up of 4 main layers:

- Troposphere
- Stratosphere
- Mesosphere
- Thermosphere
(Ionosphere & Exosphere)

Troposphere

- *Tropo-* means “turning” or “changing”
- Temp: current air temp to -60 degrees Celsius
- Location: from Earth’s surface to 12 km
- Weather occurs in this layer
- As altitude increases in the Troposphere, the temperature decreases.

What is unique about the troposphere

It is where we... sleep eat study

The lowest layer of the Earth's atmosphere...

Contains 99% of the water vapor &
75% of the atmospheric gases.

Rain, snow, and clouds occur here.



Where is the Stratosphere?

Located above the troposphere!



Stratosphere

- Strato- means “layer” or “spread out”
- Temp: -60 to 0 degrees Celsius
- Location: from 12 km to 50 km
- It contains the ozone layer, which is $O + O + O = O_3$ (Ozone).
 - Absorbs energy from Sun
 - Protects us from the Sun’s UV rays
- Weather balloons rise and gather data

What does the ozone layer do for us on Earth?

Protects us from harmful rays from the sun, by absorbing most of the ultraviolet (UV) radiation—one type of energy that comes from the sun that causes damage to skin and causes cancer.



**What is causing damage
to our ozone layer...
endangering our future!**

Hole in the Ozone Layer?



Caution! Dangerous Pollutants!

Smog

CFC's



"CFC's?! I've been using
this stuff for years!"

CFCs

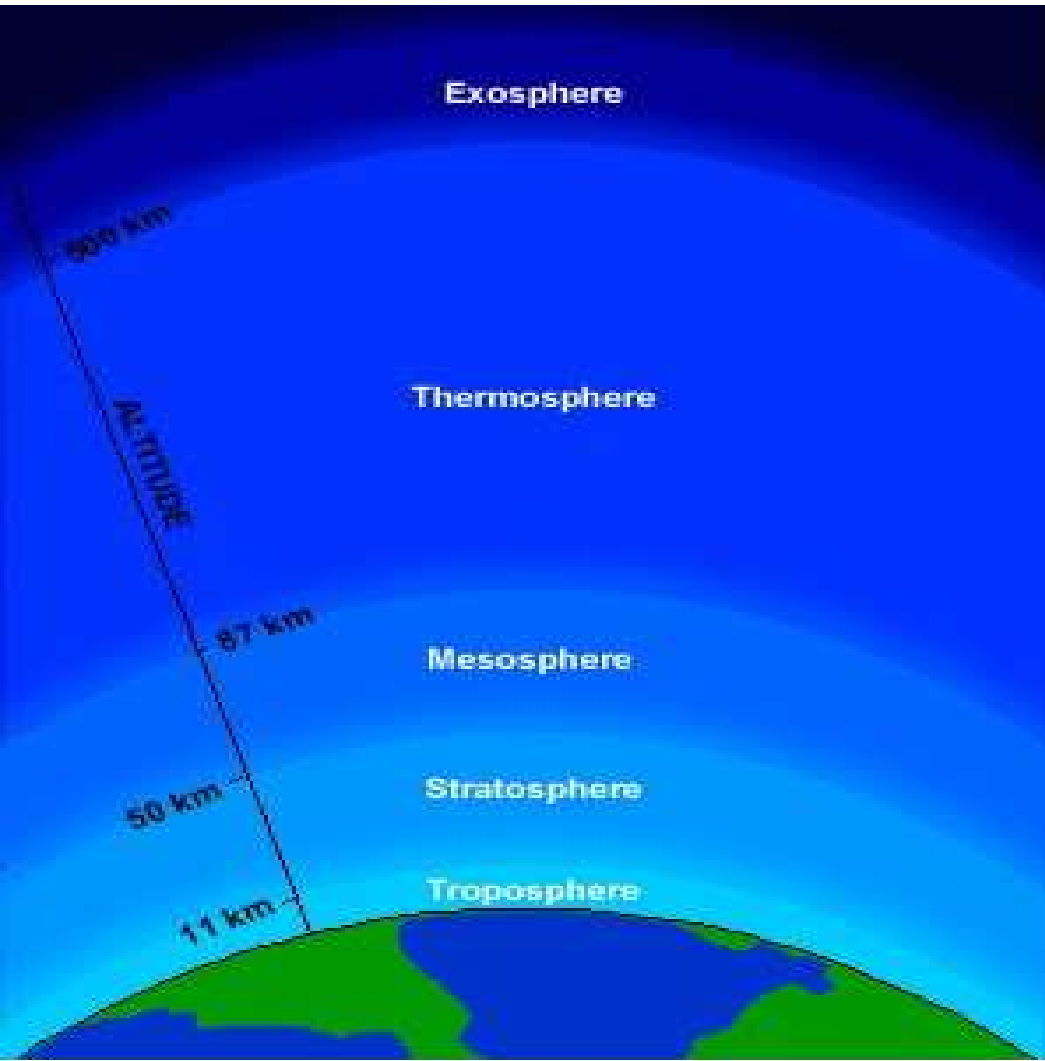
- CFCs are chlorofluorocarbons-chemical compounds used in aerosol sprays, refrigerators, air conditioners & the making of Styrofoam packing.

How do they destroy the ozone layer?

They break the ozone molecule apart causing them to change into new compounds that don't absorb UV radiation, so more radiation reaches Earth.

- Over which continent was there a big hole in the ozone layer found?
- Antarctica

What are the upper layers of the atmosphere?



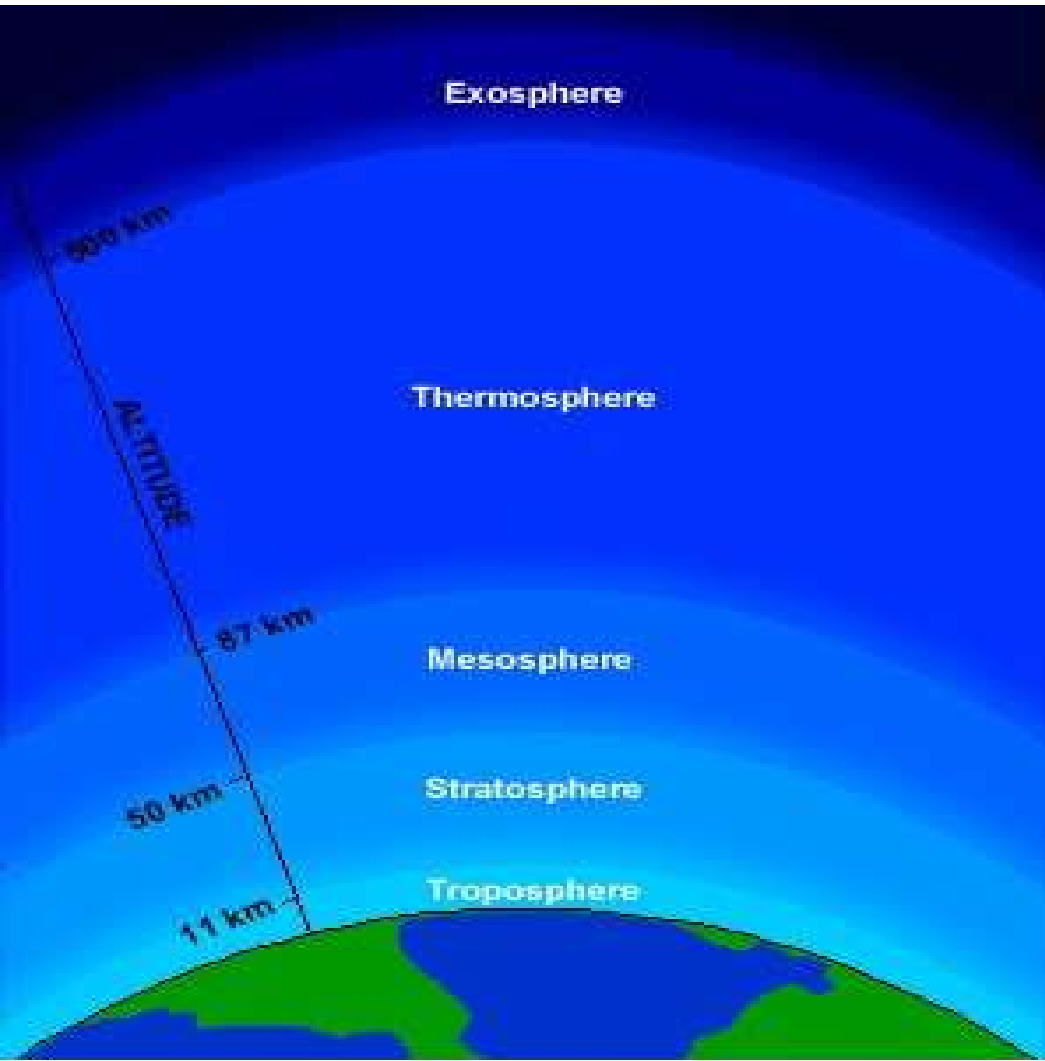
Mesosphere

Meso- means “middle”

Mesosphere

- Temp: from 0 to -90 degrees Celsius
- Location: 50 km to 80 km
- What does this layer protect us from?
 - Protects Earth's surface from being hit by most meteoroids. These chunks of rock burn and leave a streak of light known as shooting star.

What are the upper layers of the atmosphere?



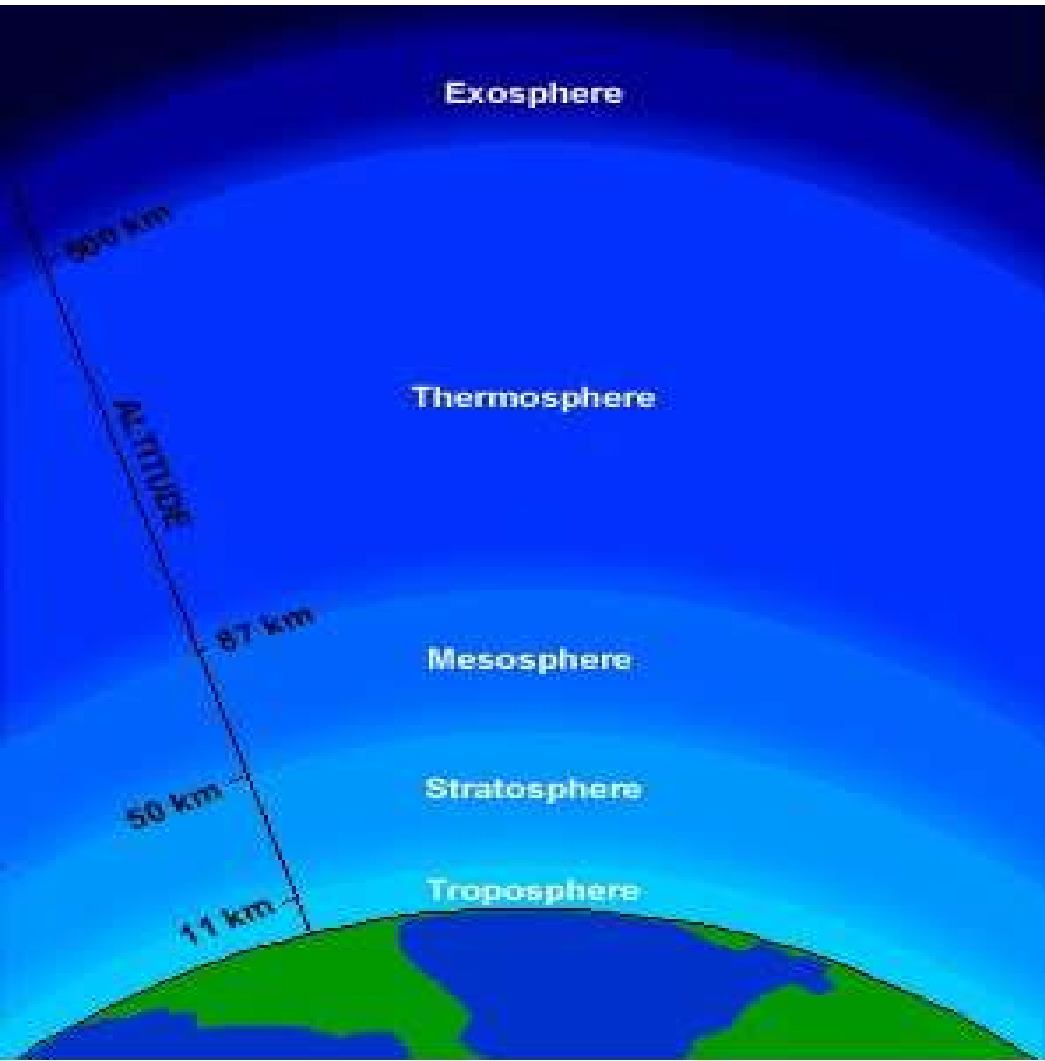
Thermosphere
(high temps)

Thermo- means “heat”

Thermosphere

- Temp: from -90 to 80 degrees Celsius
- Location: Above 80 km to outer space
- Why does it seem to be cold in this layer?
 - Even though the temp is high, the molecules are spaced far apart in thin air. There are not enough of them to collide with a thermometer and warm it very much.

What are the upper layers
of the atmosphere?



Exosphere

Exo- means “outer”

Exosphere

- Temps: outer temp of the Thermosphere
- Location: 400 km for thousands of kilometers
 - Outer most layer extending to space

Ionosphere

- Ions are electrically charged particles that allow radio waves to travel to other cities mostly at night, so you can hear radio stations from other cities in our country.
- Lowest layer of the thermosphere
 - Location: 80 km to 400 km

- Beyond the exosphere is outer space.
- Due to few molecules in this layer, the space shuttle maneuvers through this layer using only rocket thrusters because the wings are useless.

Atmospheric Pressure

What factors influence atmospheric pressure?



Earth's gravity

Distance from
Earth's surface

The closer the
atmospheric gases are
to the Earth, the
greater the pressure
or force.

Which football player feels greater pressure?



Why???

- Where is air pressure greater-in the exosphere or in the troposphere?
- Troposphere
- Why?
- Because it is the layer closest to Earth's surface.