

Atmosphere

- Chapter 3.2
- Environmental Science CP

Atmosphere

- Atmosphere - gases that surround our planet
 - ♦ Composition
 - Nitrogen
 - Oxygen
 - Carbon Dioxide
 - Methane
 - Water vapor
 - Argon
 - & All others
 - Particulates

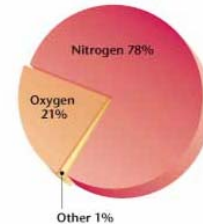


Figure 10 ▶ Ninety-nine percent of the air we breathe is made up of nitrogen and oxygen.

Air Pressure

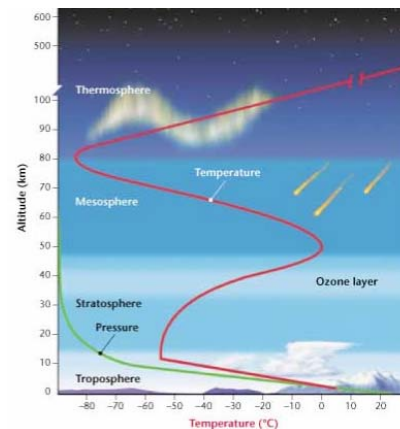
- Air molecules are pulled to the surface by gravity
- More air molecules exist near the surface
 - ♦ Air becomes less dense with altitude (thinner)
- Air molecules exert a push=pressure
 - ♦ Atmospheric Pressure=14.7 lbs/in² (p.s.i)
- Measured with a Barometer (millibars/ inches of Hg)
 - ♦ [Mr. T Productions Presents... Air Pressure](#)

Atmosphere layers

- **Troposphere** - surface to 18km high
 - ♦ All weather occurs here
 - ♦ Temperature decreases with altitude
 - -5.5°C per 1000 feet
- **Stratosphere** - 18km to 50km
 - ♦ Temperature increases
 - The ozone layer
 - Chemical formula is O₃
 - O₃ Absorbs UV energy from sun
 - Protects earth from extra heat / UV rays

Atmosphere layers

- **Mesosphere** - 50km to 80km
 - ♦ Coldest of all layers
 - ♦ -93°C
- **Thermosphere** - 80km to 550km
 - ♦ Nitrogen and oxygen absorb UV energy, gamma rays and x rays from sun
 - ♦ Aurora - atoms become excited (ionized) from energy and emit glowing light (northern lights)
 - ♦ Temperatures to 2000°C - high energy



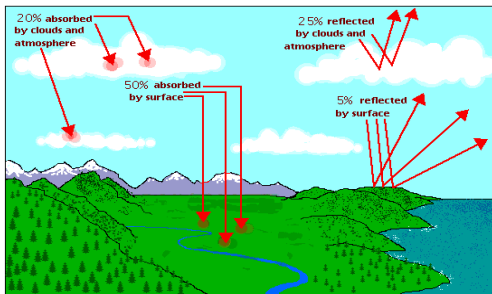
Energy in the Atmosphere

Energy Transfer (heat)

- **Radiation** - the transfer of energy across empty space
- **Conduction** - transfer of energy by direct contact
- **Convection** - the transfer of energy in currents (air / water)

How does the atmosphere get heated?

1. Radiation from sun
 - Absorbed by thermosphere and stratosphere
 - Reflected by clouds, dust, ground
 - 50% reaches earth's surface as heat
2. Ground gives heat to air by conduction
3. Heat is moved through atmosphere by convection



Greenhouse Effect

- **Gases in atmosphere act like glass in a greenhouse**
- **Trap heat**
- **Greenhouse gases** - natural effect that keeps us warm.
 - ♦ Carbon dioxide
 - ♦ Water vapor
 - ♦ Methane
 - ♦ Nitrous oxide
- **Problem** - pollution causes excess greenhouse gases that causes warming to occur faster than normal