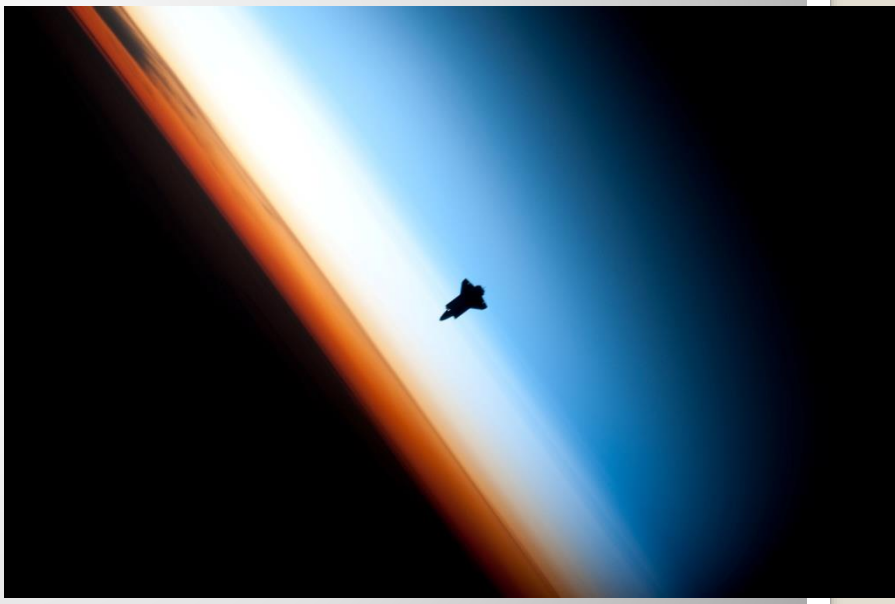
The Atmosphere

Characteristics & Composition of the Atmosphere

- Atmosphere: layer of gases and tiny particles surrounding Earth

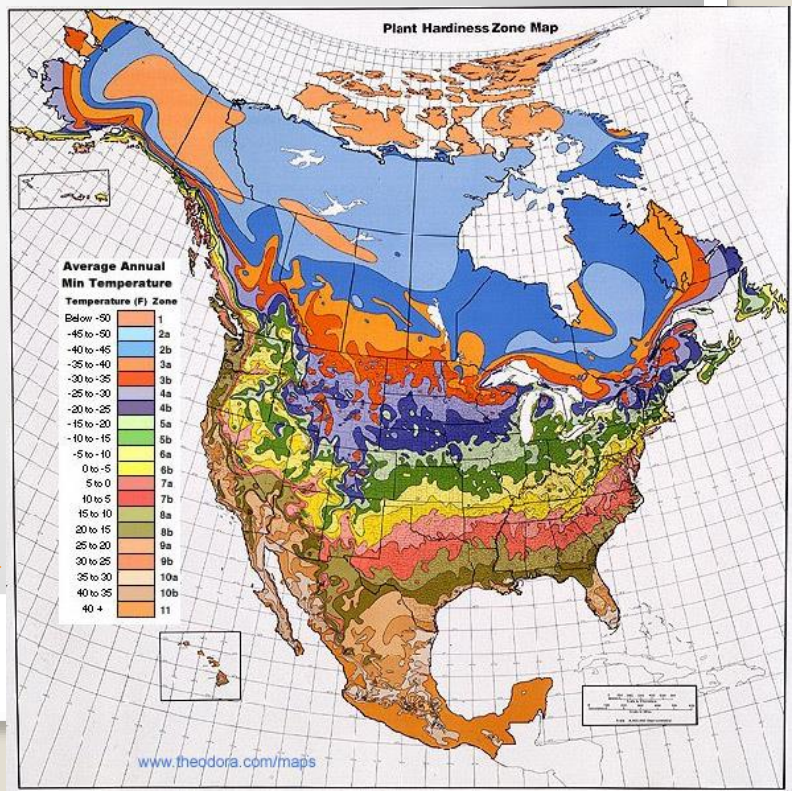


Earth's Atmosphere

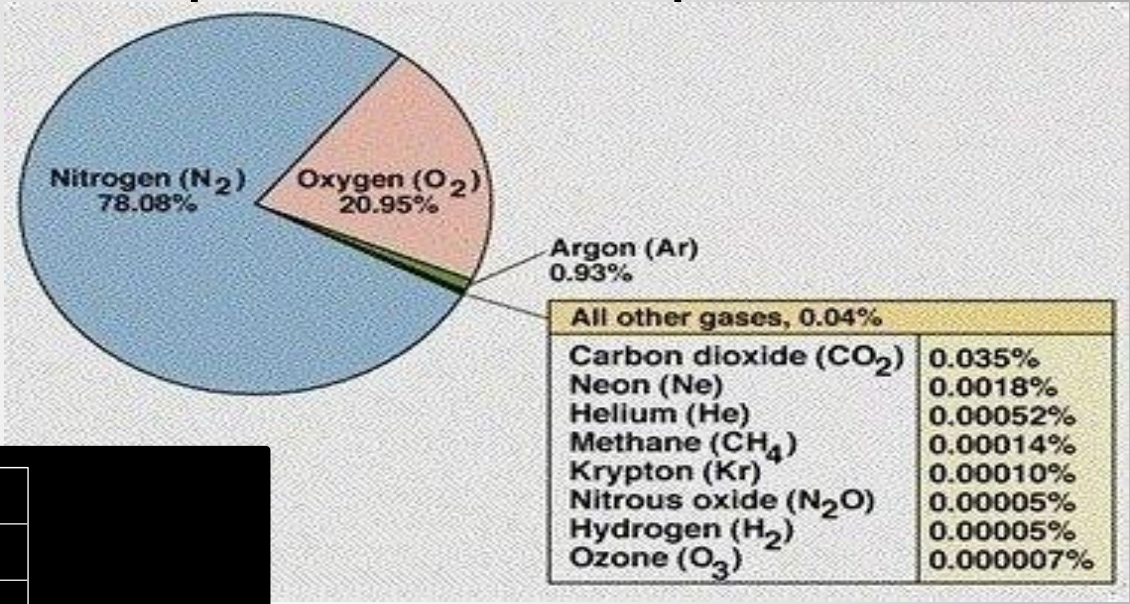
- **Meteorology: study of the atmosphere**
- **weather and climate:**
  - **<u>Weather</u>: atmospheric conditions at a certain time and place**

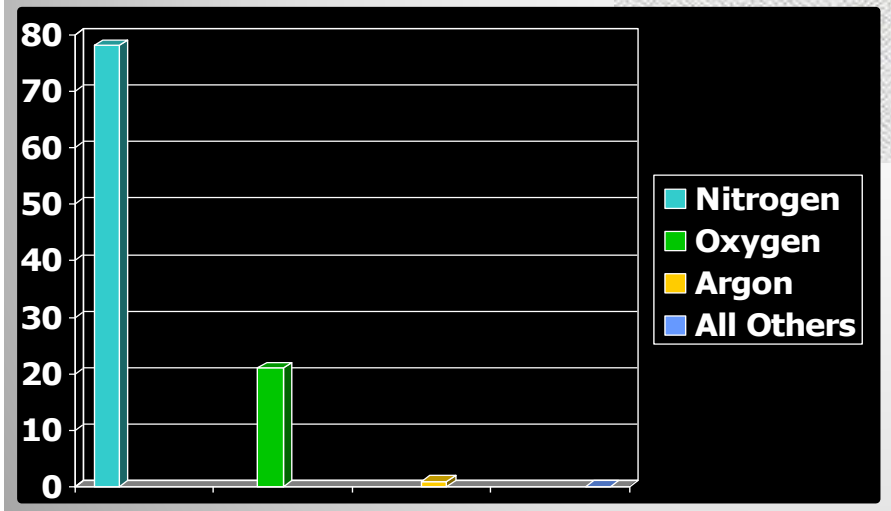
Stormy Weather

  - **<u>Climate</u>: recorded weather of an area over extended period**



- The Earth's atmosphere is comprised of:
- 78%: N
- 21%: O





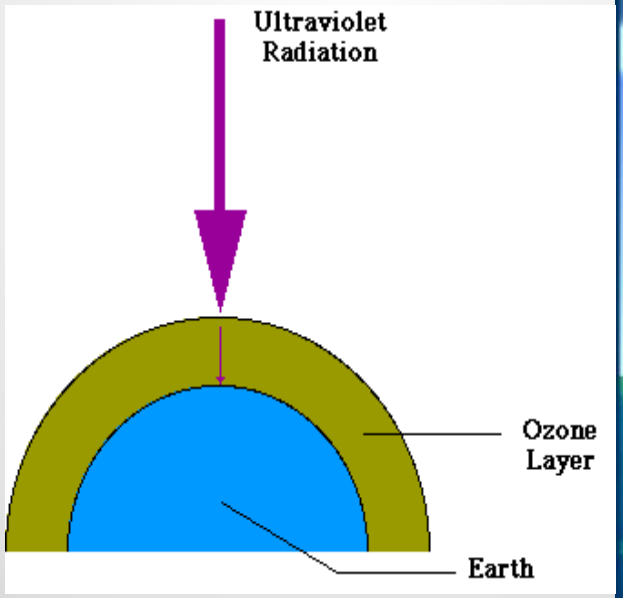
Other particles: volcanic dust, ocean water vapor, minerals, vaporized meteors

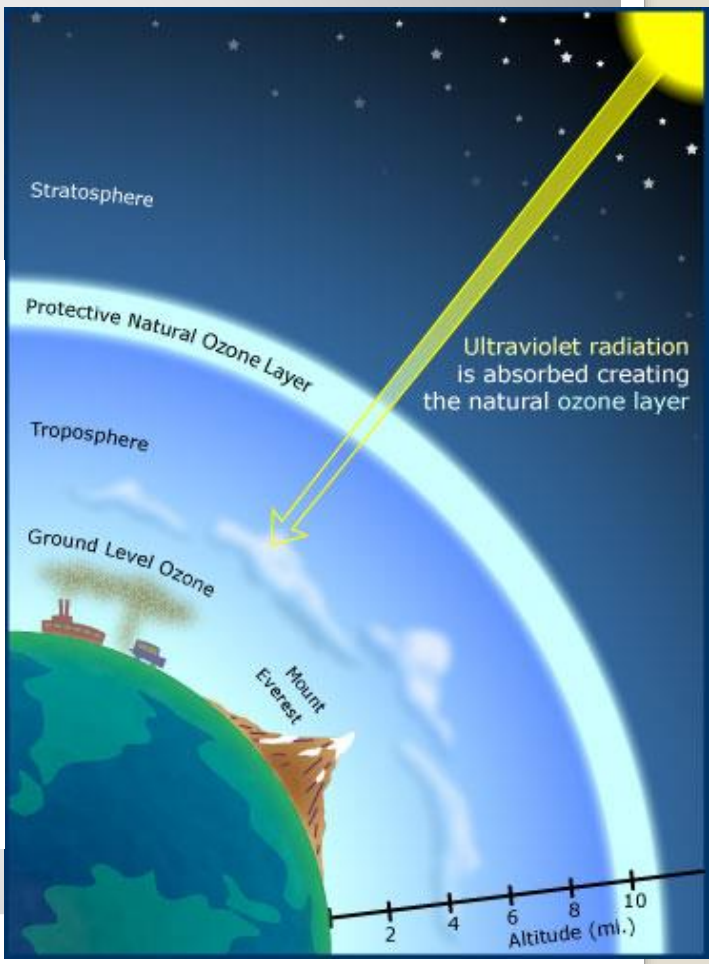
- Ozone (O_3): in stratosphere, absorbs ultraviolet radiation
- To much UV causes:

Sunburn

Cataracts

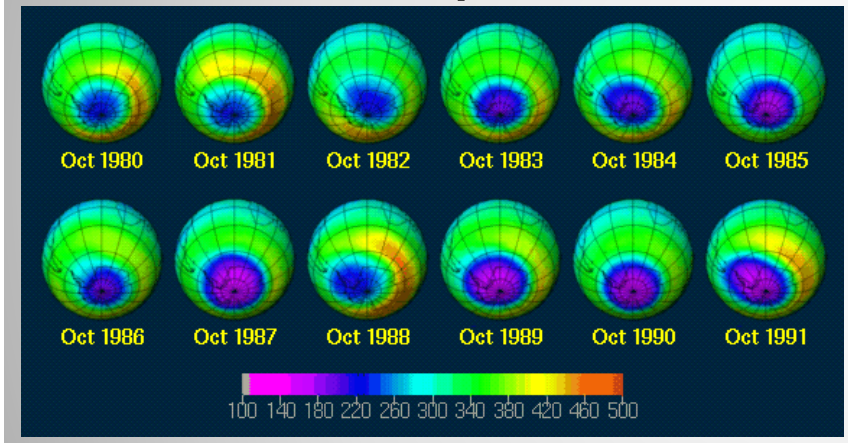
Skin Cancer



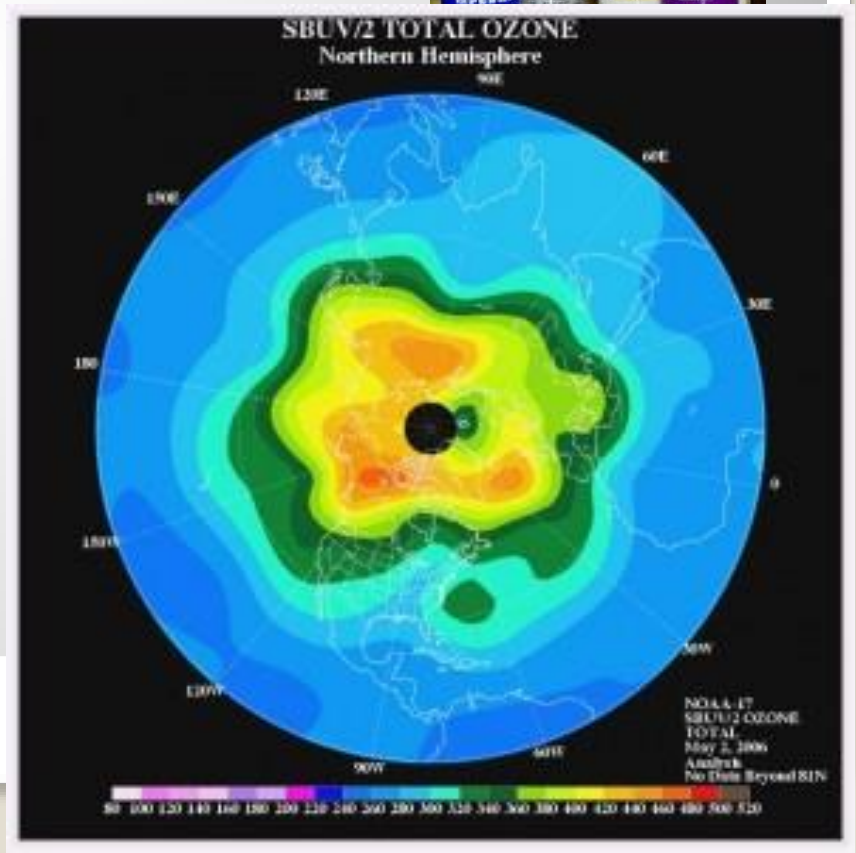


Ozone absorbs 99% of harmful UV radiation

- Human activities created holes in ozone CFC's (Chlorofluorocarbons) = a chemical from factories, major cause of ozone depletion

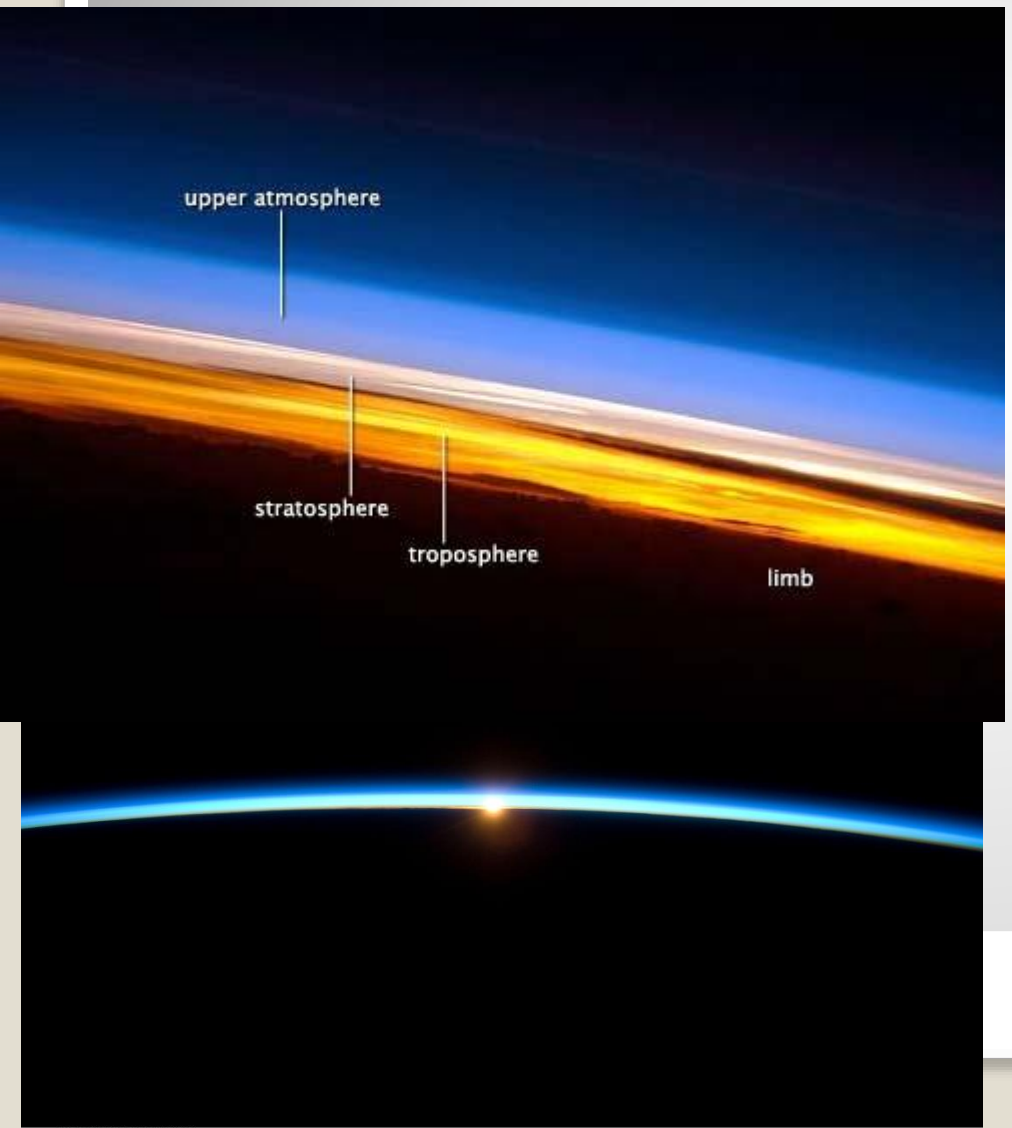


Purple-blue: little or no ozone
Yellow-Green: more ozone

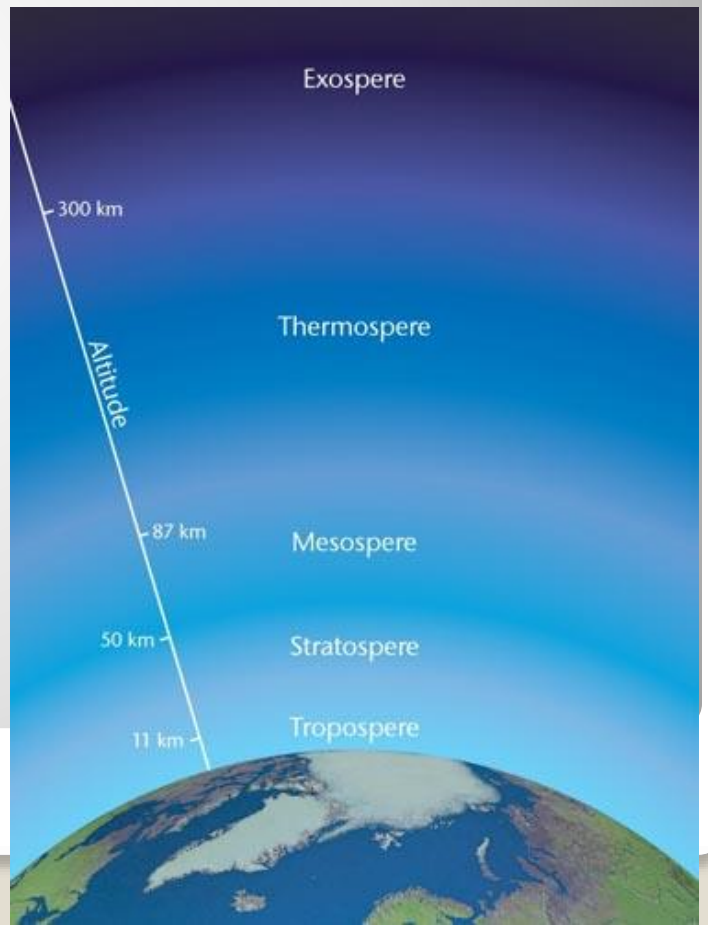


Atmospheric Pressure

- Gravity pulls 99% of gas to first 22 miles of atmosphere, last 1% extends ≈340 miles

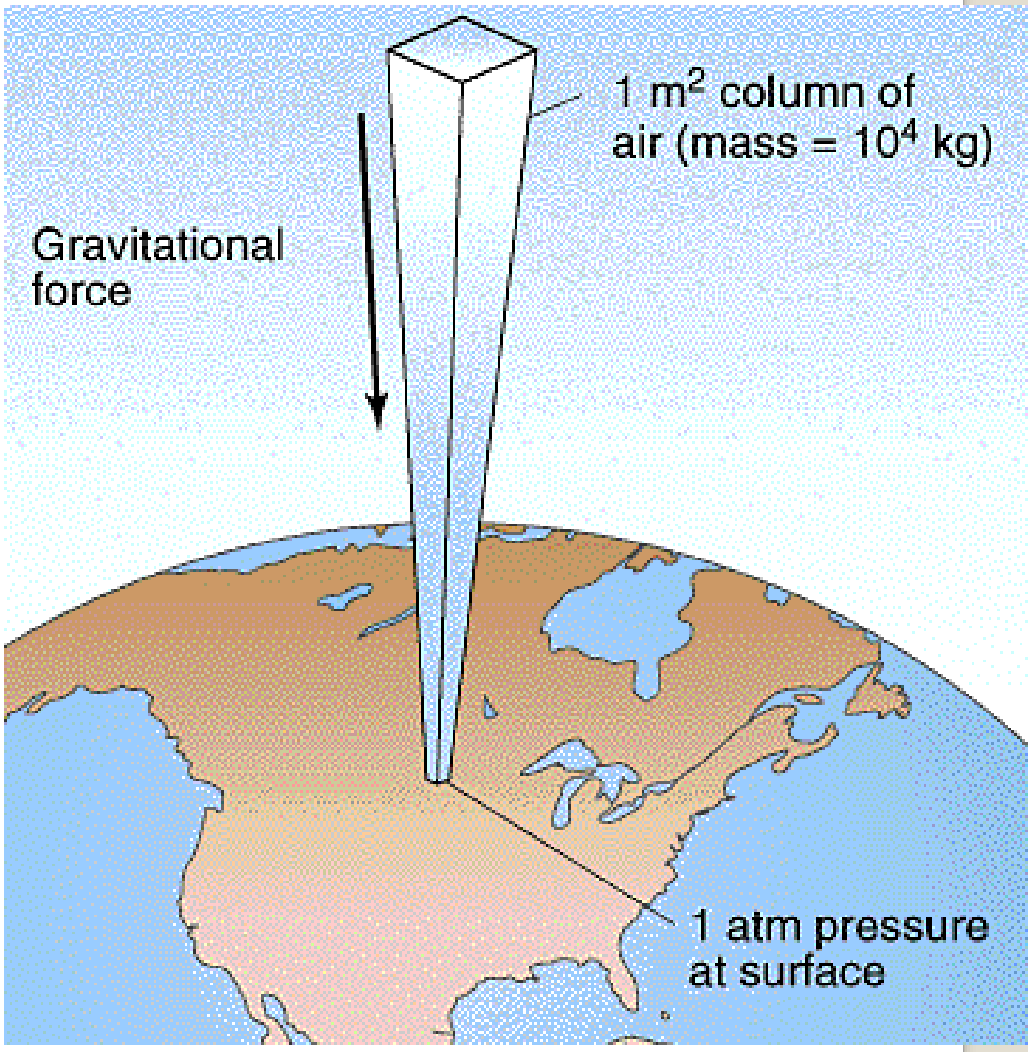


As you go higher in the atmosphere it gets thinner and has less air pressure



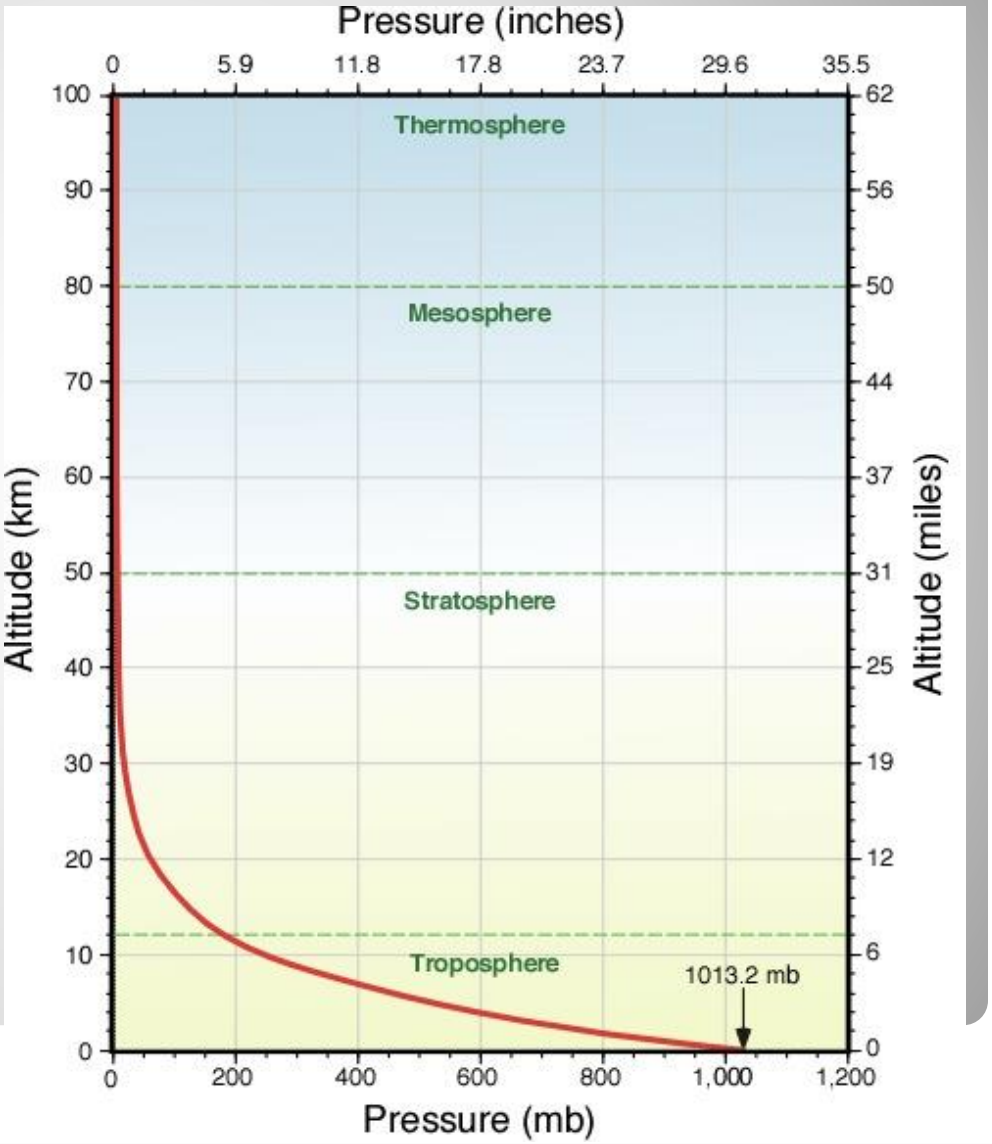
sea level atmosphere presses **14.7** lbs. per square inch

ratio of the weight of air to the area of the surface it is pressing down on is called **atmospheric pressure**.



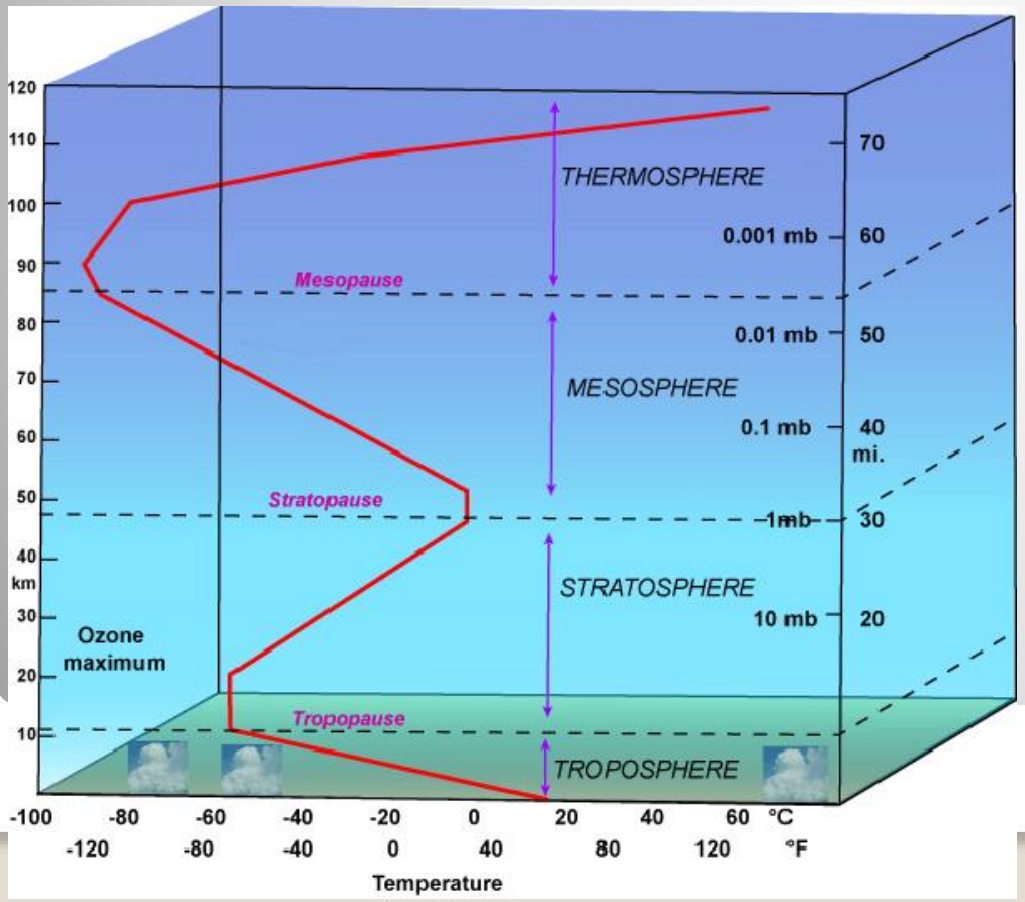
- higher you go, lower the air pressure

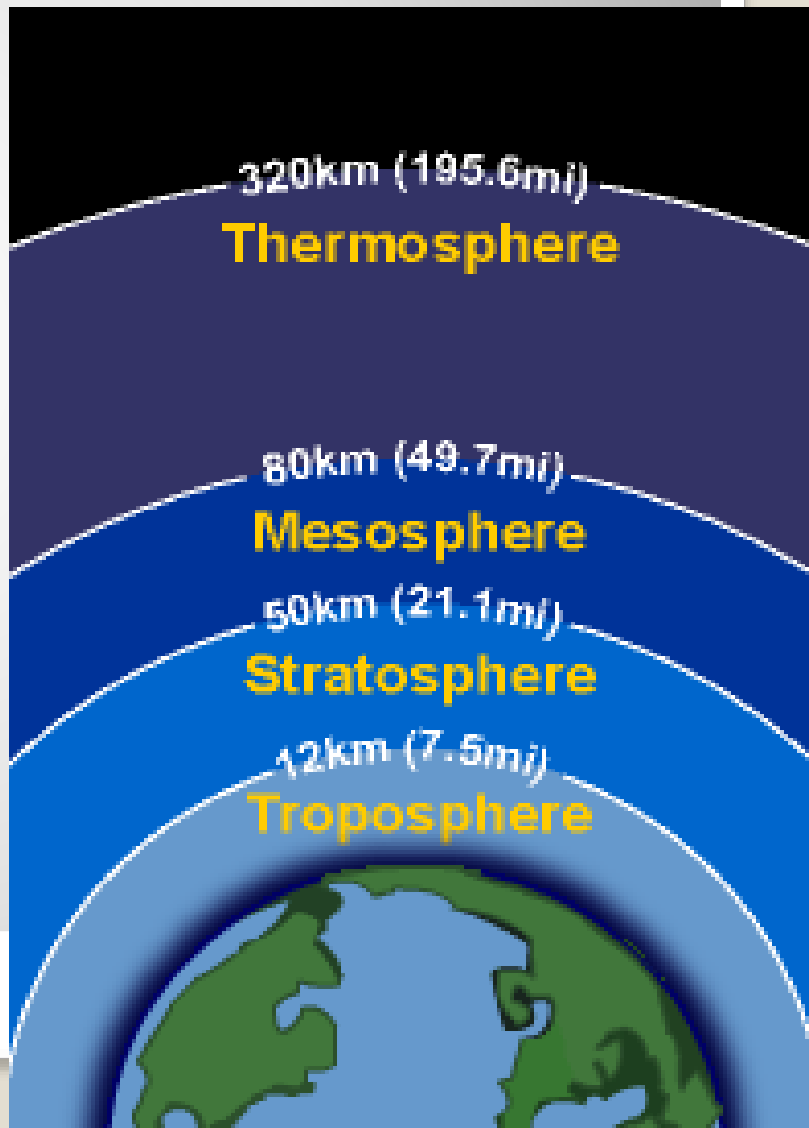
[Powerful Air Pressure Demonstration]



Layers of Atmosphere rap

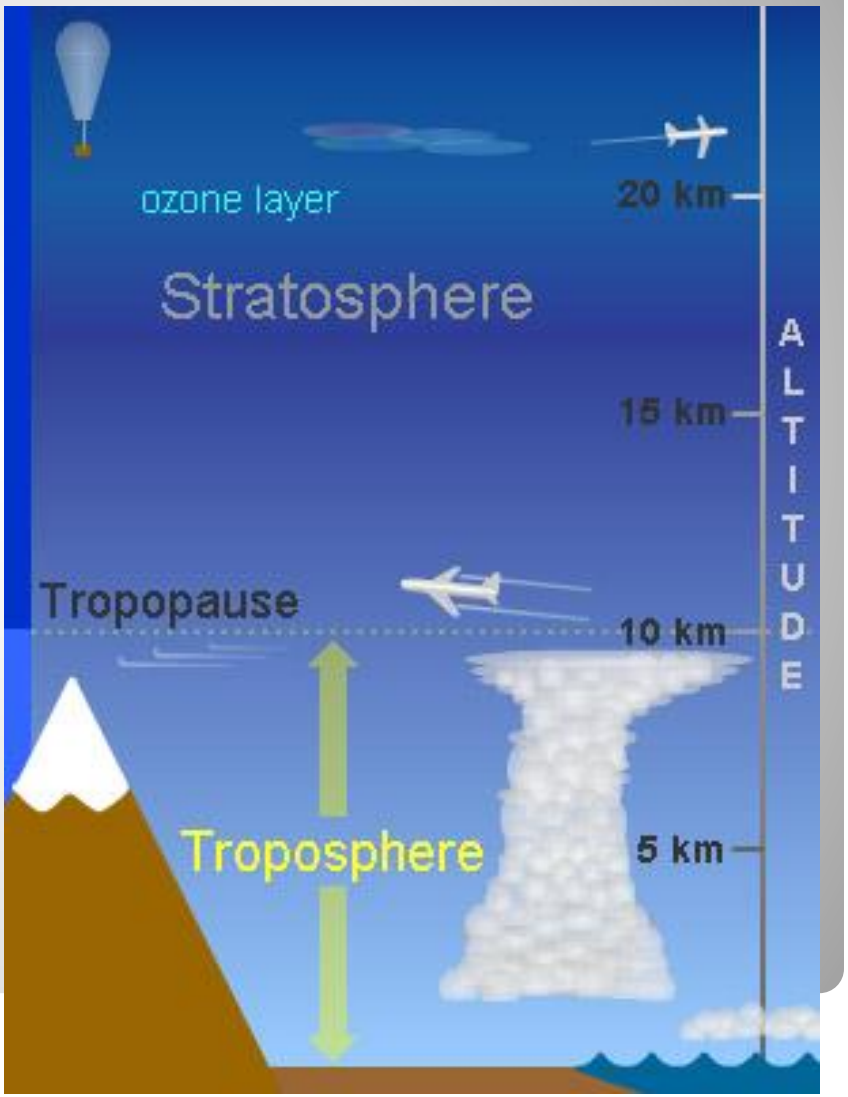
- Atmosphere separated into 4 layers by **temperature gradient (temp change)**
- layers absorb different amounts of solar energy



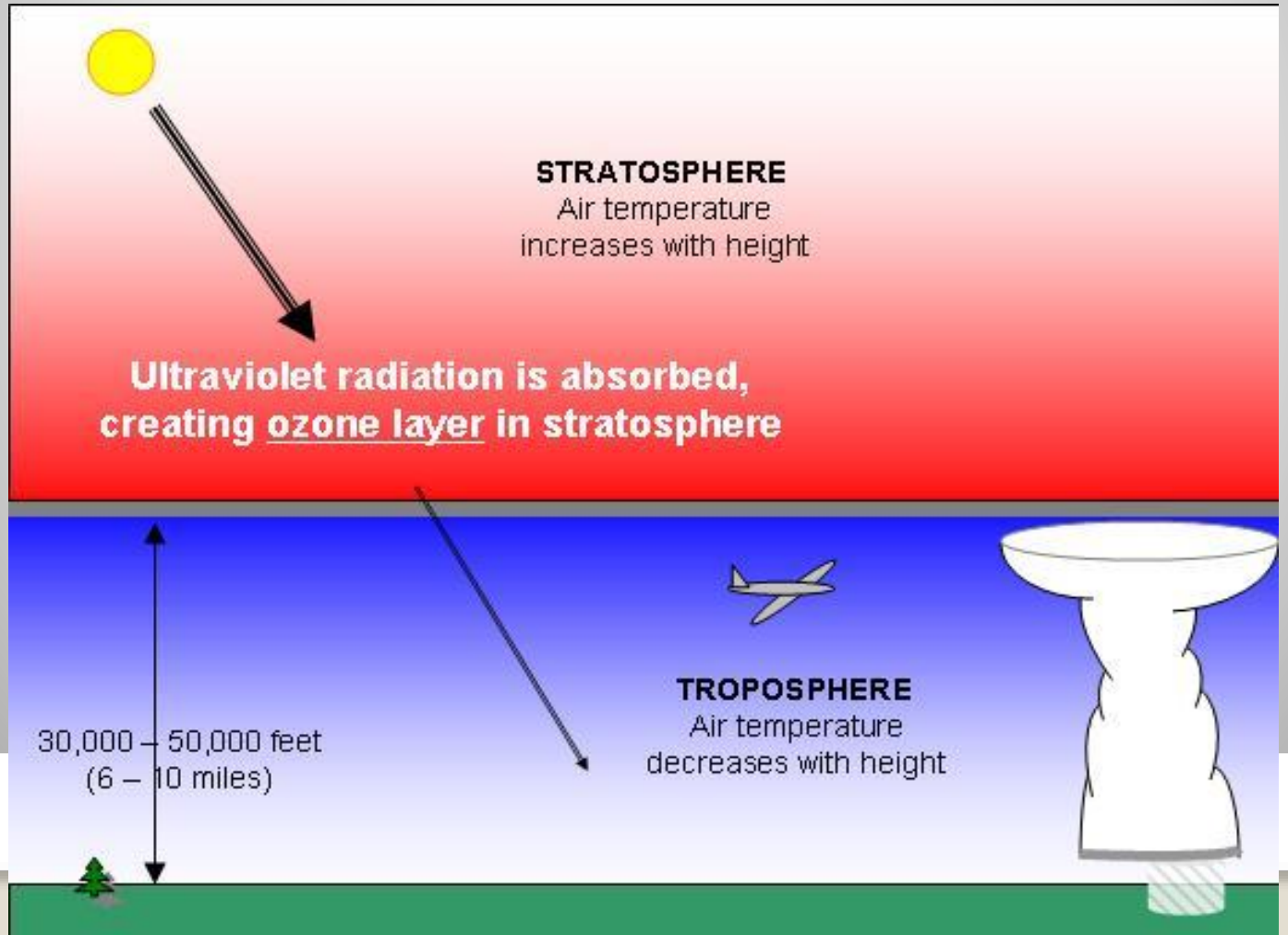


Layers of the Atmosphere

- Troposphere: 1st layer - we live in it
- All weather
- water vapor & carbon dioxide
- altitude ⬆, temp ⬇



- Stratosphere: 2nd layer
- Nearly all ozone concentrated here
- altitude ↑, temp ↑

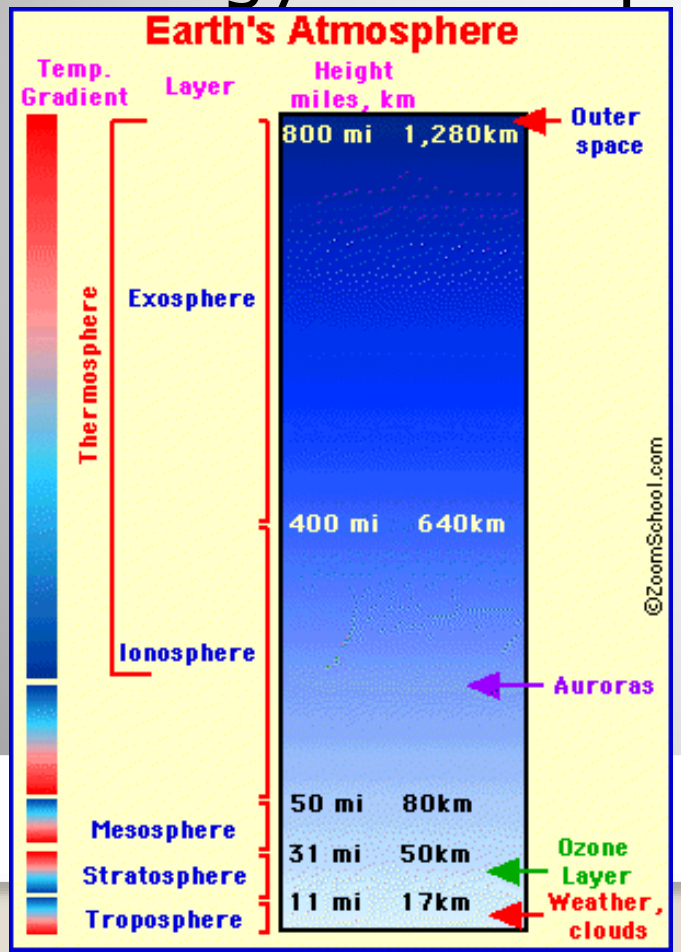


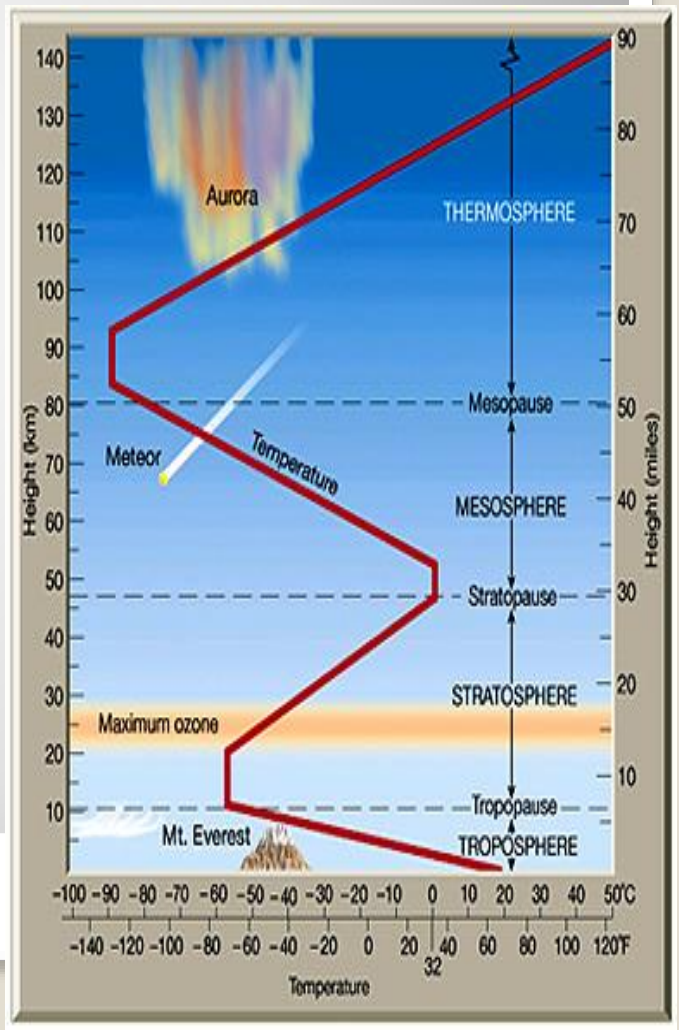
Layers of the Atmosphere

- Mesosphere: 3rd layer – extends up to 50 miles into sky
- Altitude ↑, temp. ↓

Noctilucent Mesospheric clouds

- Thermosphere: 4th layer – altitude ⬆, temp. ⬆
- Nitrogen and oxygen atoms absorb solar energy heats up to 3600°F





- Northern Lights (auroras): lower part of thermosphere absorbs solar rays causing gases to loose electrons, create ions, release photons, which create auroras

Northern Lights
The Northern Lights - Wonders of the Solar System

- High atmosphere!

U-2 Flight - 70,000ft

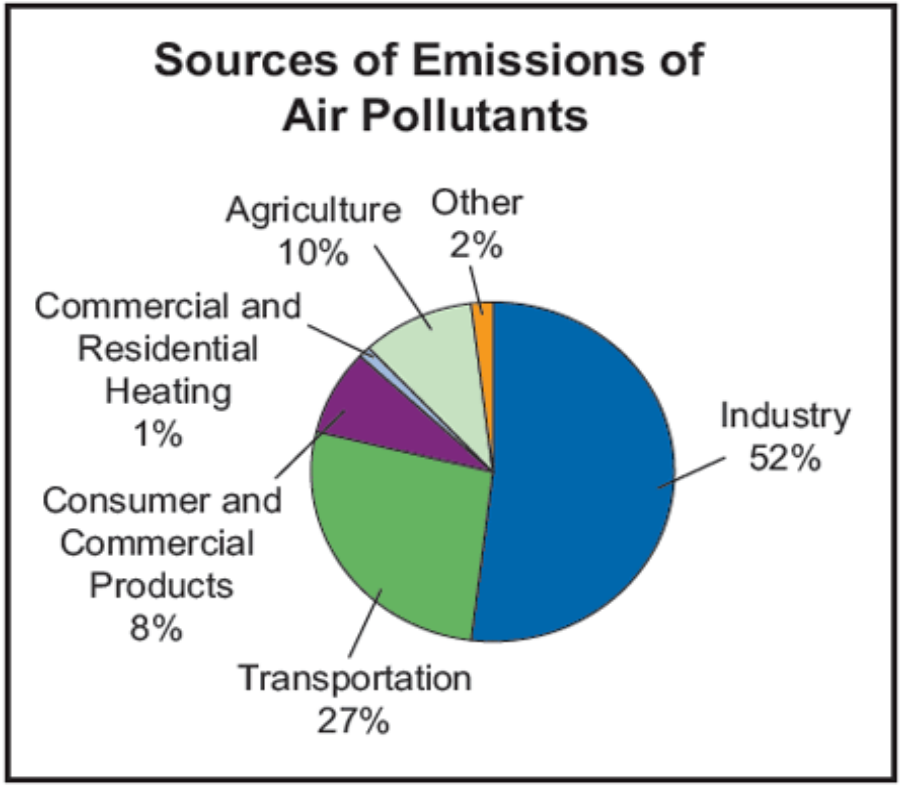
2:40, 430

- Air pollution: any substance in air that is harmful to people, animals, plants, or property

Los Angeles

Beijing, China

Most air pollutants come from burning of fossil fuels in the form of cars, factories, and energy production



Acid Rain: pollutants mix with water in air to produce acid, can poison fish, ruin soil, and kill crops and trees

A journey through the Atmosphere

60 years of acid rain