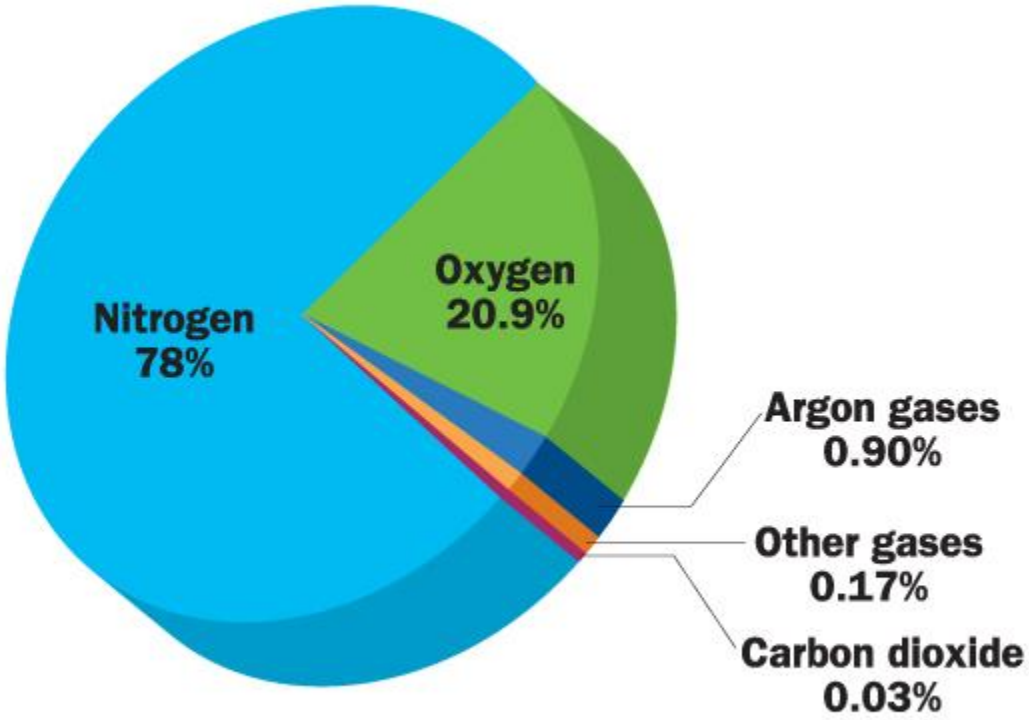
Atmosphere

Atmosphere

Layer of gases that surround the earth. It's purpose is to:

1. Support life on Earth by protecting it from dangerous electromagnetic radiation
2. Create and control weather and climate
3. Provide the gases that plants and animals need to breathe

Atmosphere



Composition of the Atmosphere

- 78% Nitrogen
- 21% Oxygen
- .90% Argon
- .03% Carbon dioxide CO_2
- .17% other trace gases (Neon, Methane, Krypton, Hydrogen)

Atmosphere

Gases important to life on Earth

Nitrogen (N)

- Removed from atmosphere by bacteria and lightning
- N compounds used by plants in growth and development

Oxygen (O)

- Released into atmosphere by plants as they photosynthesize

Water vapor (H_2O)

- Amount varies in the atmosphere
- Cycles through the Hydrologic (water)Cycle

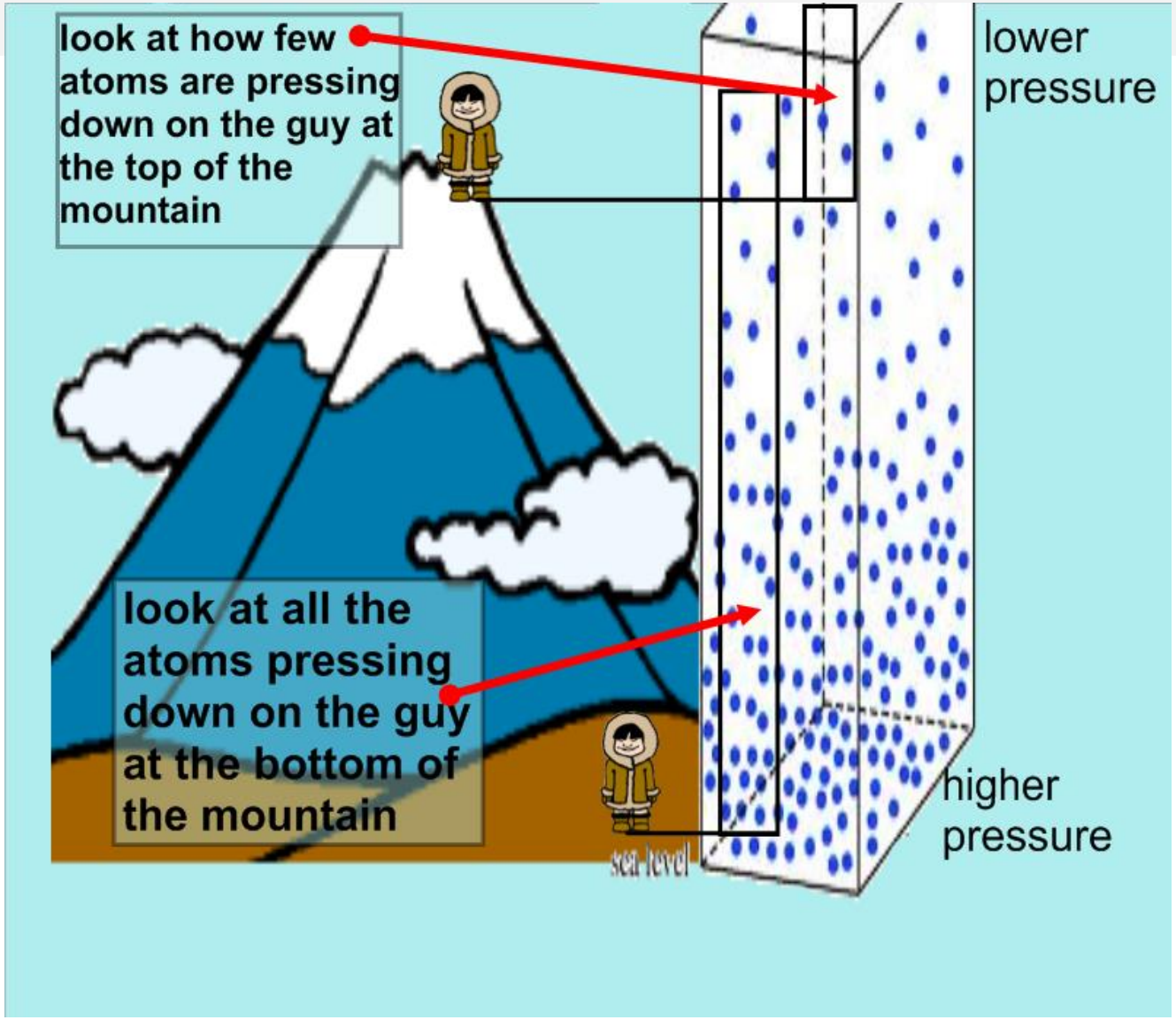
Carbon dioxide (CO_2)

- Removed from the atmosphere by green plants

Atmosphere

Atmospheric Pressure

- Pressure exerted on Earth by atmosphere
- Decreases with increased altitude
- 14.7 pounds per square inch at sea level

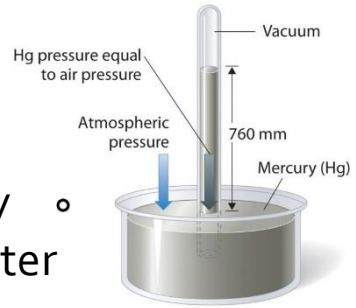


Atmosphere

Atmospheric Density

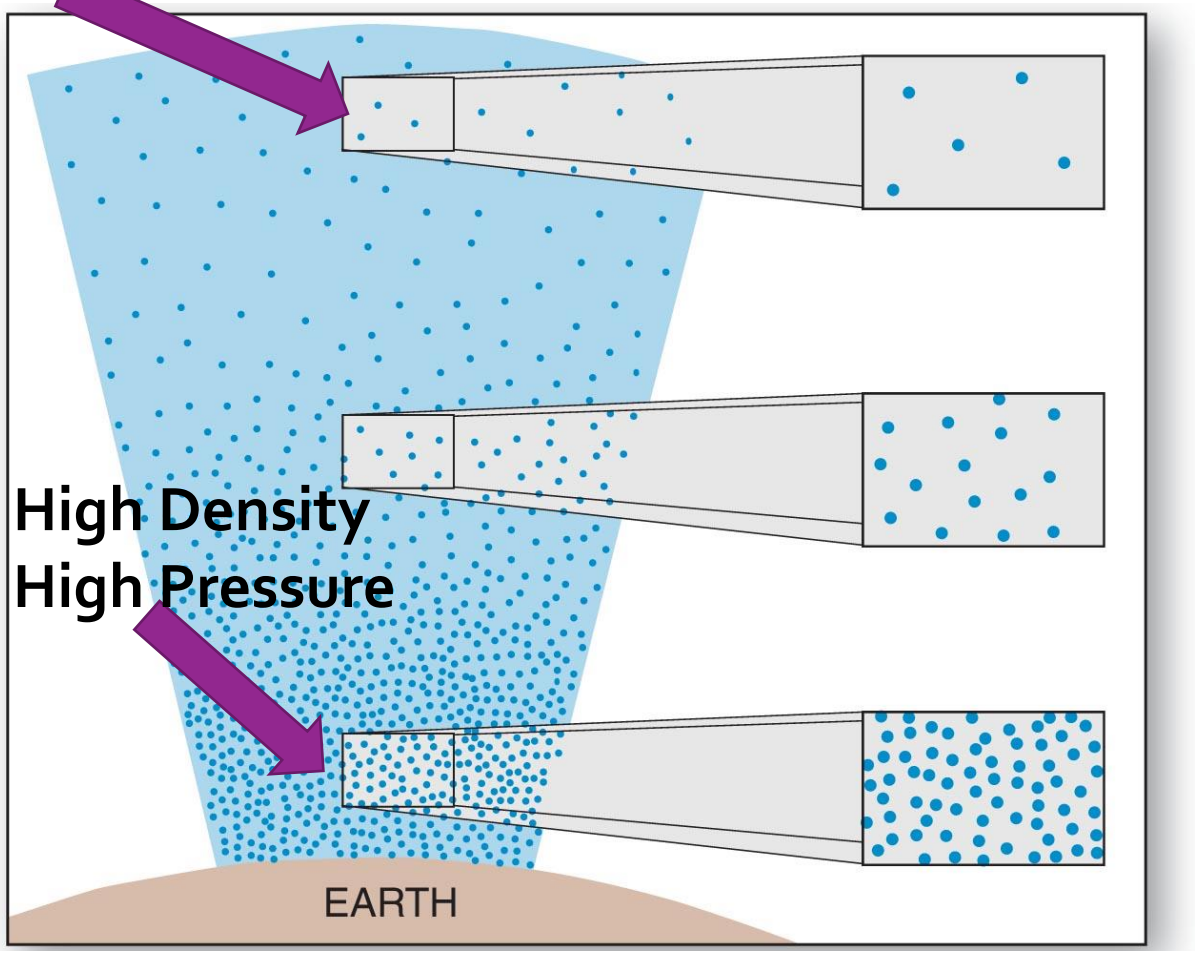
- Density – mass/volume, amount of matter in an area

- At greater altitudes (height above sea level) the same volume contains fewer molecules of gases
- Measured with a barometer
  - Barometer – tool to measure air pressure



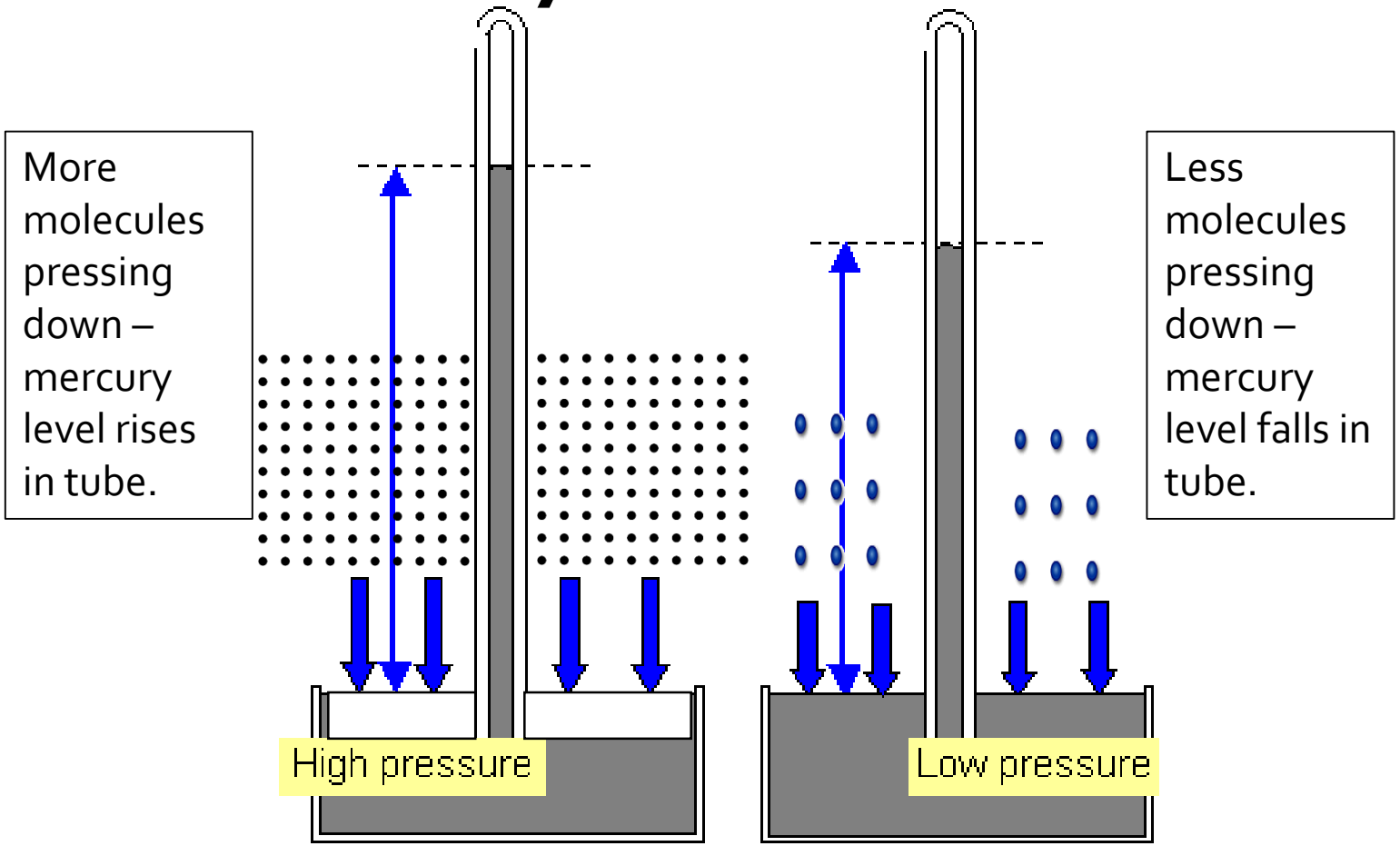
Mercury barometer

Aneroid barometer

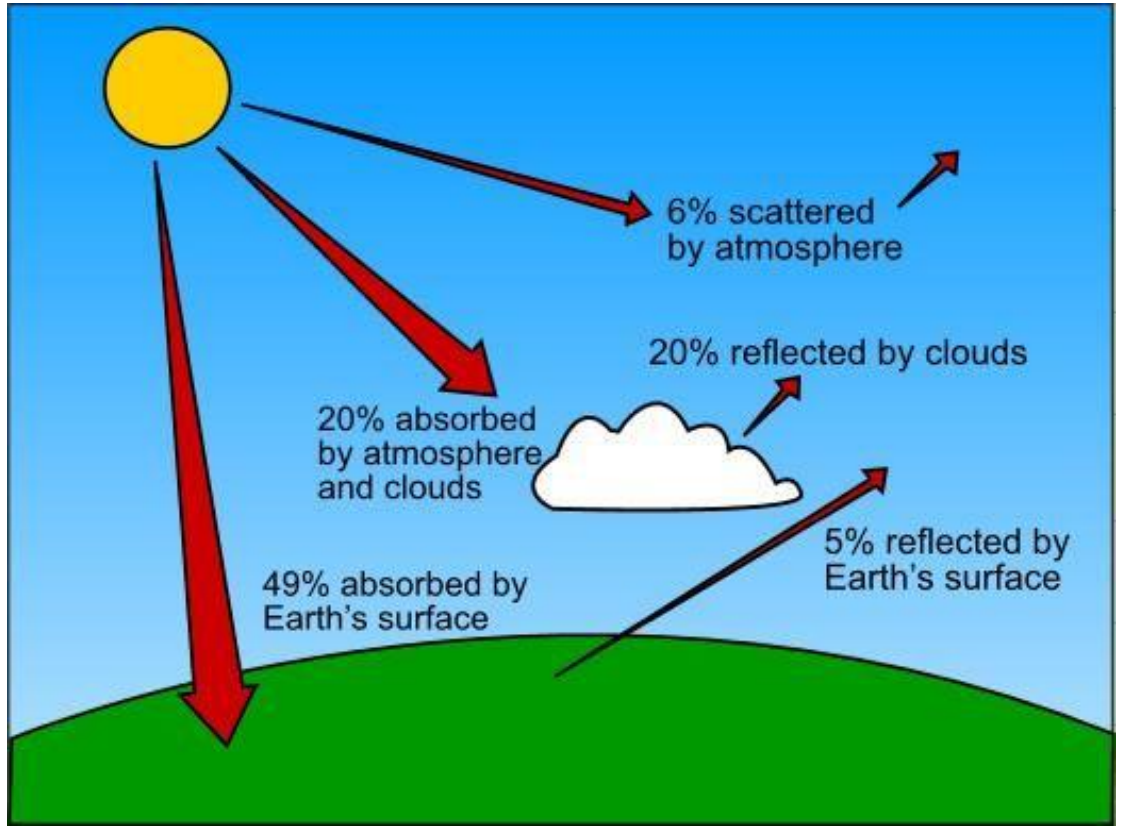


Atmosphere

Atmospheric Density



Atmosphere



Atmospheric Warming

Solar radiation

- 49% absorbed by earth's surface
- 20% reflected back by clouds
- 20% absorbed by atmosphere and clouds
- 6% scattered by atmosphere
- 5% reflected by earth's surface

Equals 100%

Atmosphere – **T**aylor **S**wift **M**ight **S**peak **I**n **E**nglish / **T**he **S**trange **M**an **T**ours **I**n **E**ngland

Layers of the Atmosphere

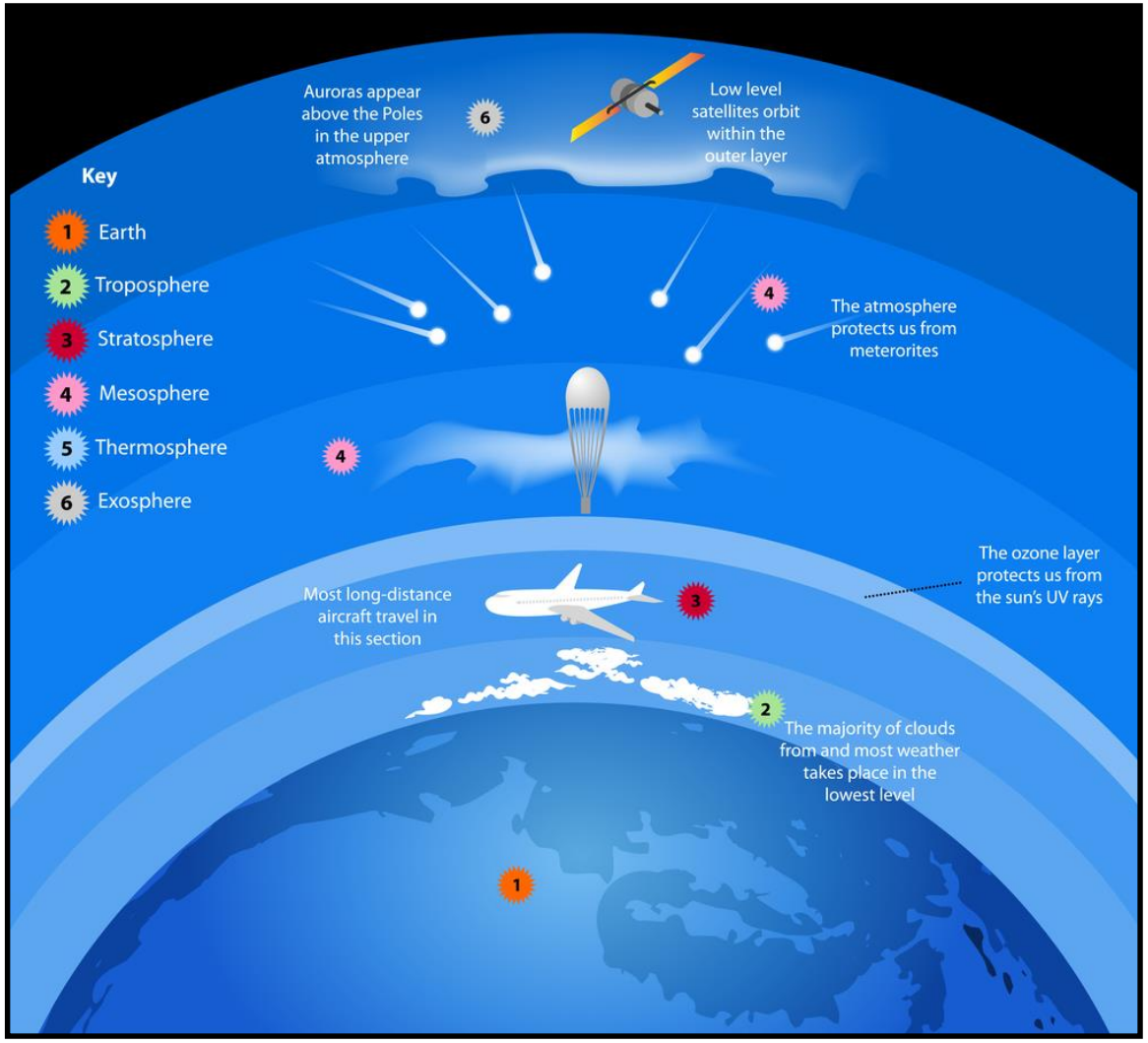
- Troposphere
- Stratosphere
- Mesosphere
- Thermosphere
  - Ionosphere
  - Exosphere

***Know them in order**

Layer Boundaries

- Differences in temperatures separate each layer from the one above it.

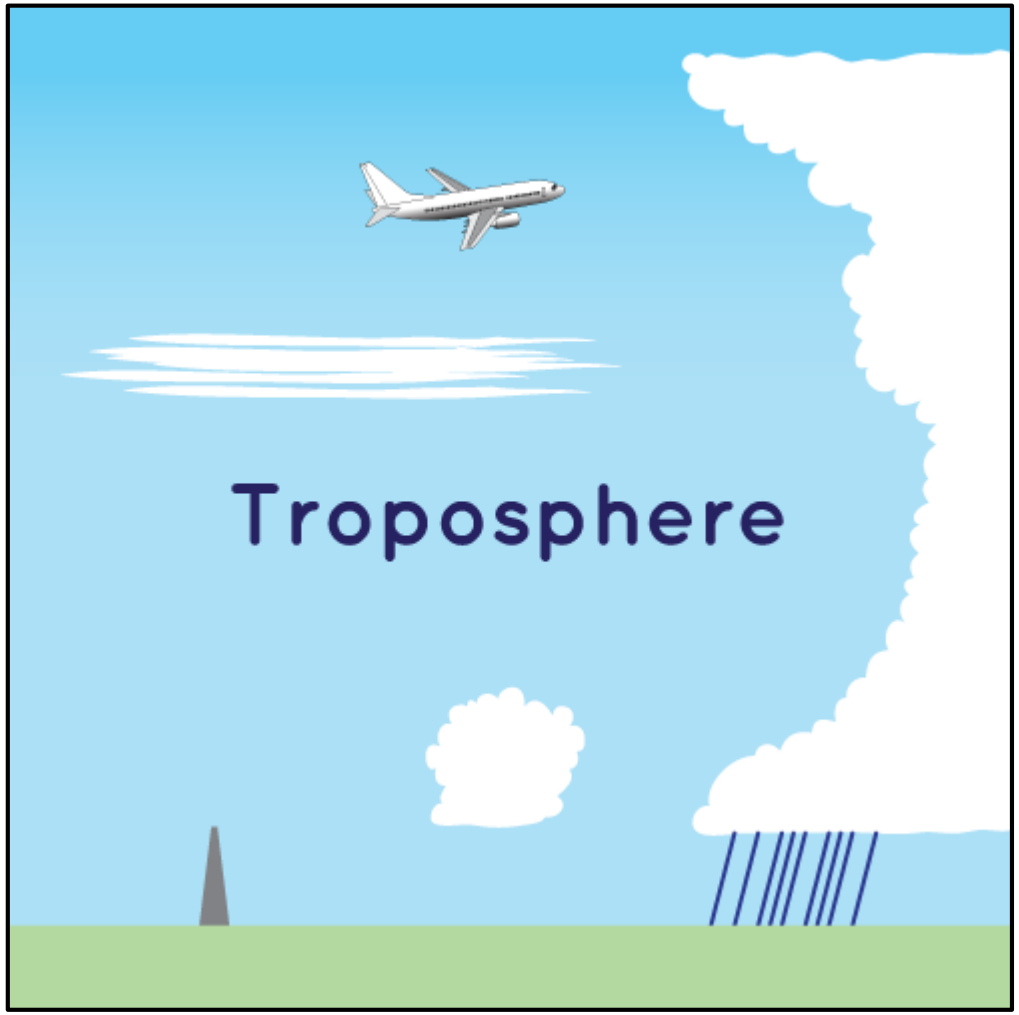
- The Seals Made Tea In England



Atmosphere

Troposphere

- Lowest layer
- Most atmospheric air is found here – most dense layer
- Thickest over equator; thinnest over the poles.
- Extends from 0 -14Km (9mi.) above earth
- Air temperature decreases with height above earth.
- Virtually all weather occurs here



Atmosphere

Stratosphere (Second Layer)

- 14km to 50km above earth
- Very calm layer allows for undisturbed flight
- Lower stratosphere is cold (about – 60 degrees C); upper stratosphere is warmer due to absorption of sun's energy by the ozone layer
- Ozone layer found near the bottom of stratosphere – protects earth from ultraviolet radiation, made up of O_3 (three oxygen molecules)

Weather balloons

Supersonic Jets

Atmosphere

Mesosphere

- 50km – 80km
- Middle layer of the atmosphere
- Air temp. decreases with height above Earth.
- Coldest layer -100° C
- Protects earth – meteoroids usually burn up in this layer.

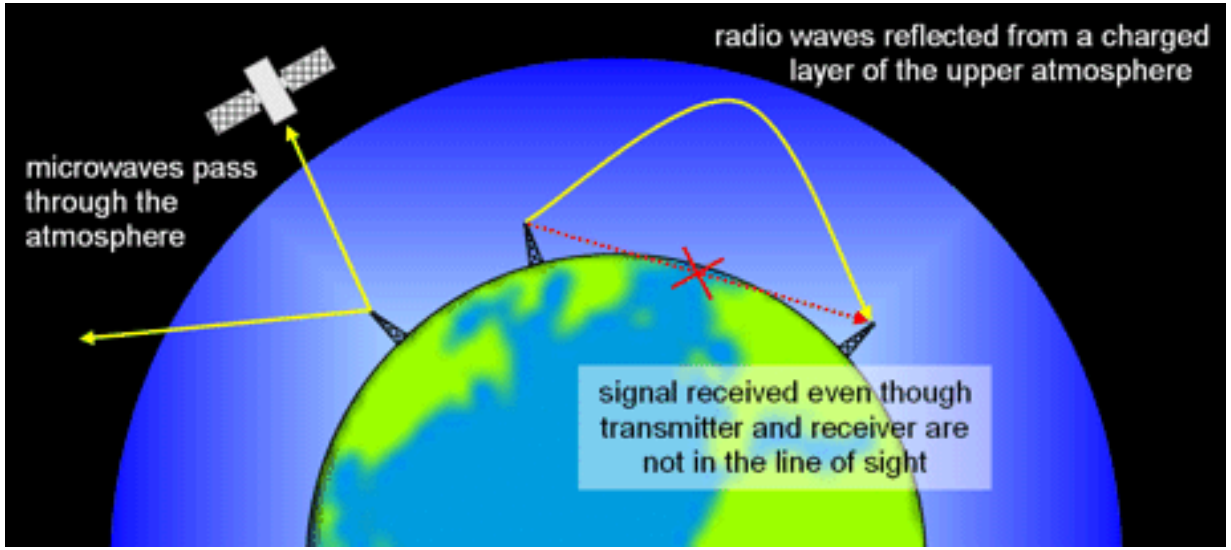
Remember:
Space rocks in space = meteors
Space rocks in atmosphere = meteoroids
Space rocks on earth's surface = meteorites

Atmosphere

Thermosphere = “heat sphere”

- 80km out into space (no definite outer limit)
- Temp. increases with height above earth. 1,800° C = 3,300° F
  - You would not feel the heat because air molecules are so spread apart
- Aurora Borealis (Northern Lights)
- Space shuttle orbits here
- Ionosphere – the lower part
- Exosphere – the upper part

Atmosphere



- Lower level of the thermosphere
- Auroras Borealis (Northern Lights) occur here

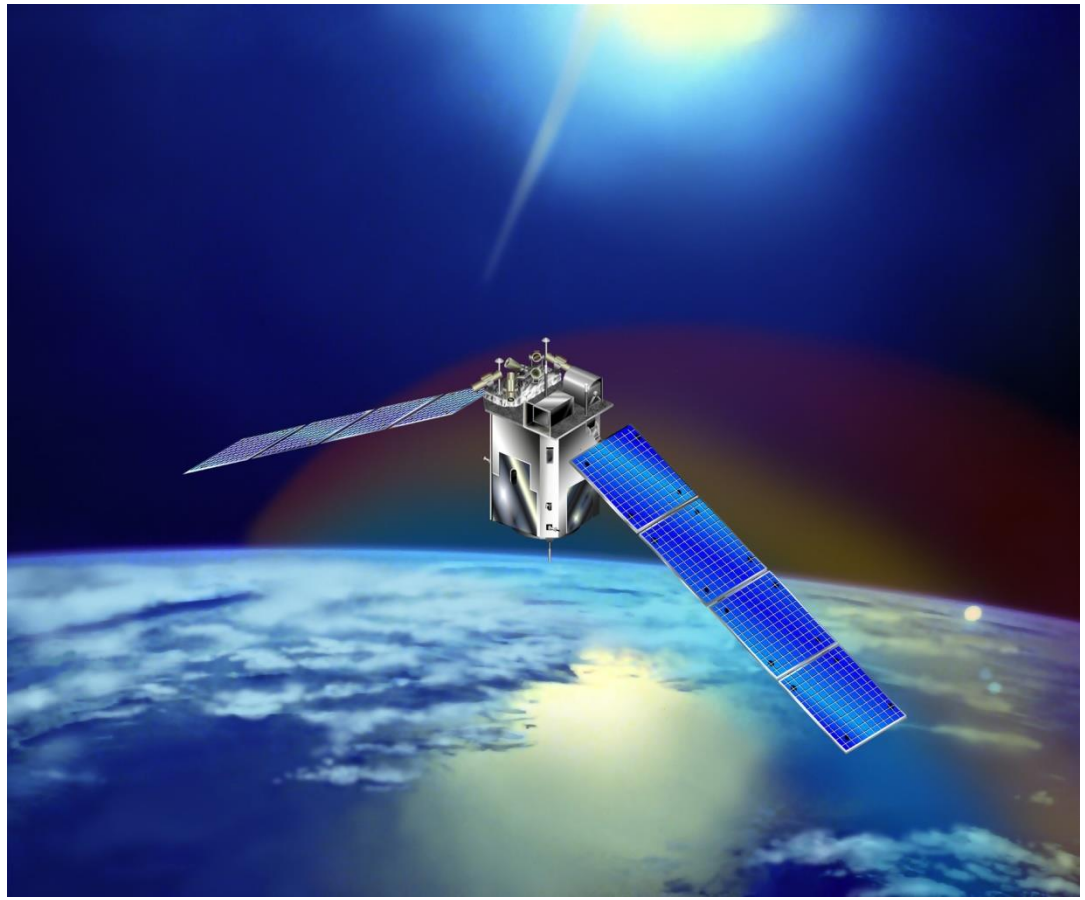
Ionosphere

- 80km – 550km
- Gas particles absorb ultraviolet and X-ray radiation from the sun.
- Particles become electrically charged (ions).
- Radio waves are bounced off the ions and reflect back to Earth.

Atmosphere

Exosphere

- 550km - thousands of km into space (no definite outer limit)
- Air is very thin
- Satellites orbit the earth here
- Space Shuttle orbits here



Quick Action – Atmosphere

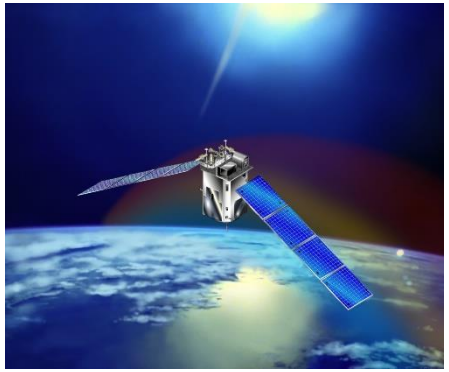
Individually write down on a piece of paper which pictures matches each layer of the atmosphere.

Remember they are:

Troposphere
Stratosphere
Mesosphere
Ionosphere
Exosphere

Draw a quick picture by each to help you remember what is happening.

A



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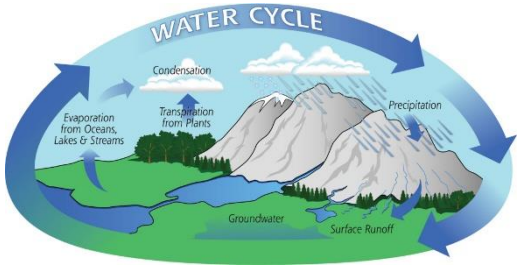

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