Unit 6 - Ch 17.1-17.2

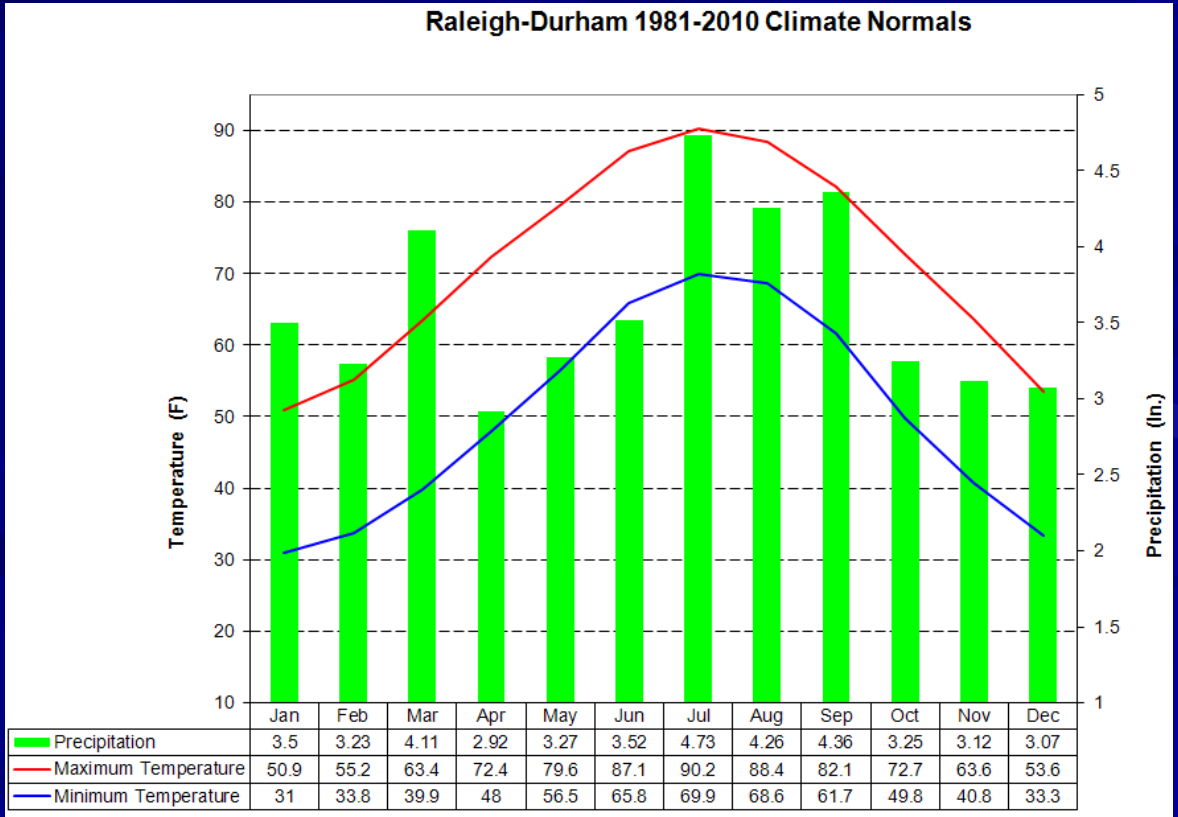
Atmosphere Characteristics

Weather vs Climate

- ***Weather*** - State of atmosphere ***changes*** at ***given*** time and place

Weather vs Climate

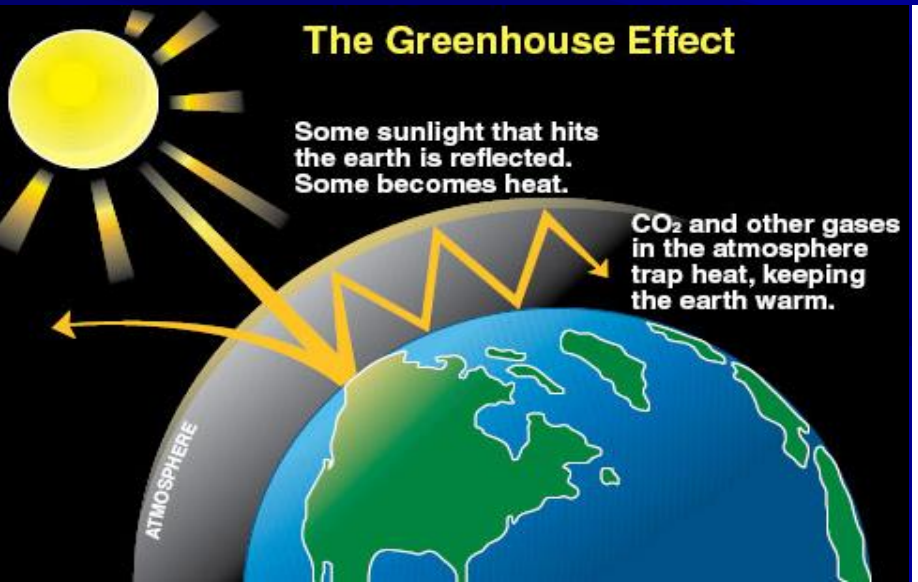
- ***Climate*** - Weather ***patterns*** of a region over many ***years***

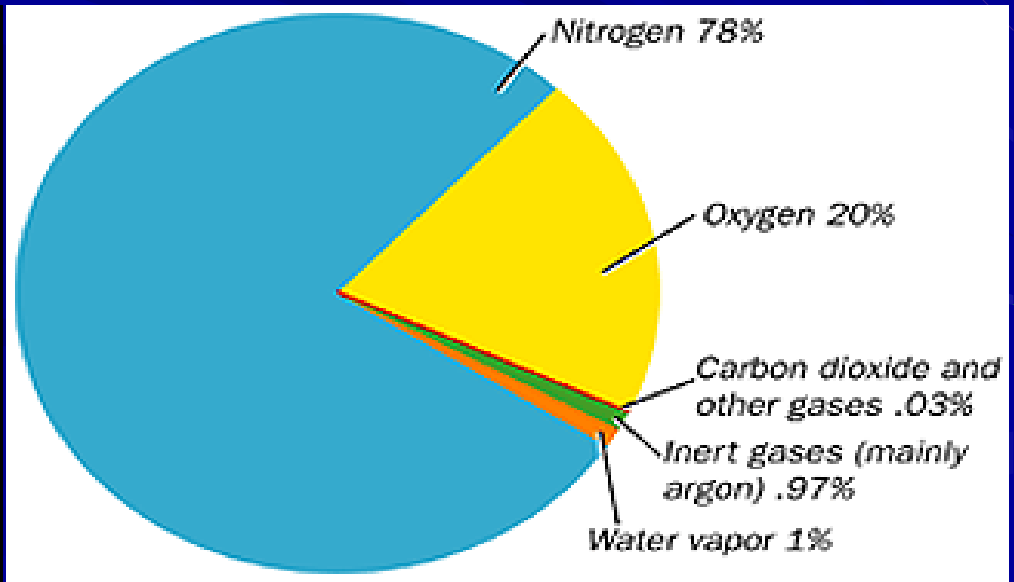


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precipitation	3.5	3.23	4.11	2.92	3.27	3.52	4.73	4.26	4.36	3.25	3.12	3.07
Maximum Temperature	50.9	55.2	63.4	72.4	79.6	87.1	90.2	88.4	82.1	72.7	63.6	53.6
Minimum Temperature	31	33.8	39.9	48	56.5	65.8	69.9	68.6	61.7	49.8	40.8	33.3

Composition of Atmosphere

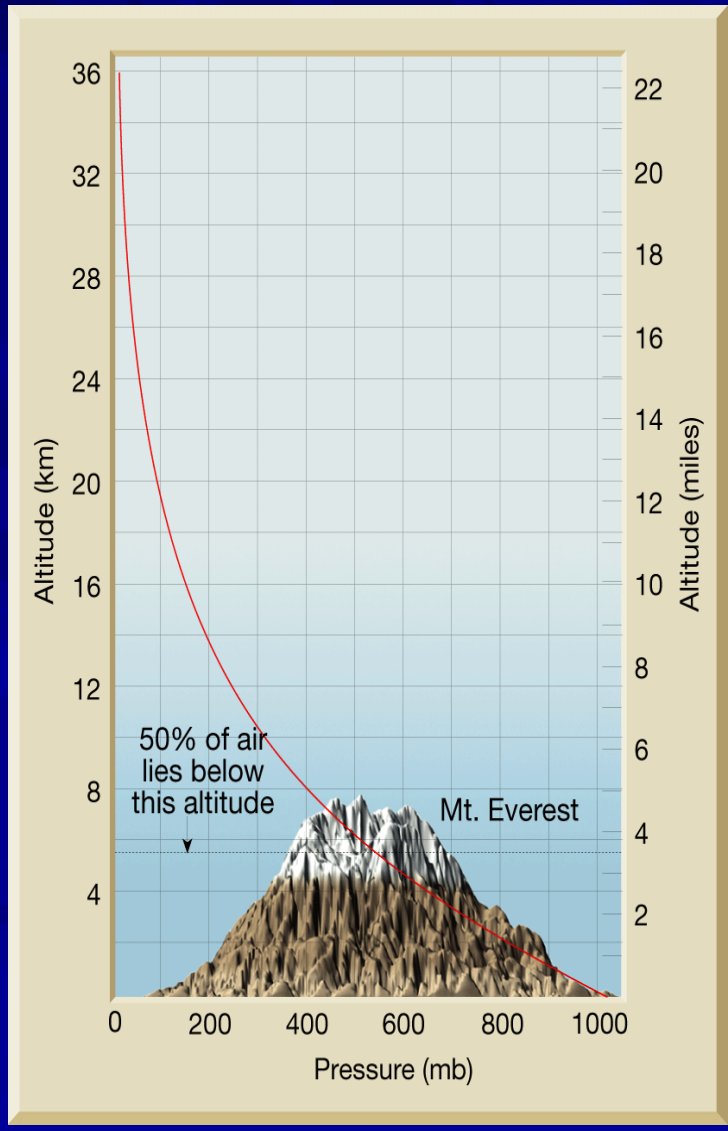
- ***Nitrogen*** (N_2) - **78%**
- ***Oxygen*** (O_2) - **20%**
- ***Water Vapor*** (H_2O) - **1%**
- ***Argon*** (Ar) - **0.97%**
- ***Carbon Dioxide*** (CO_2) - **0.03%**





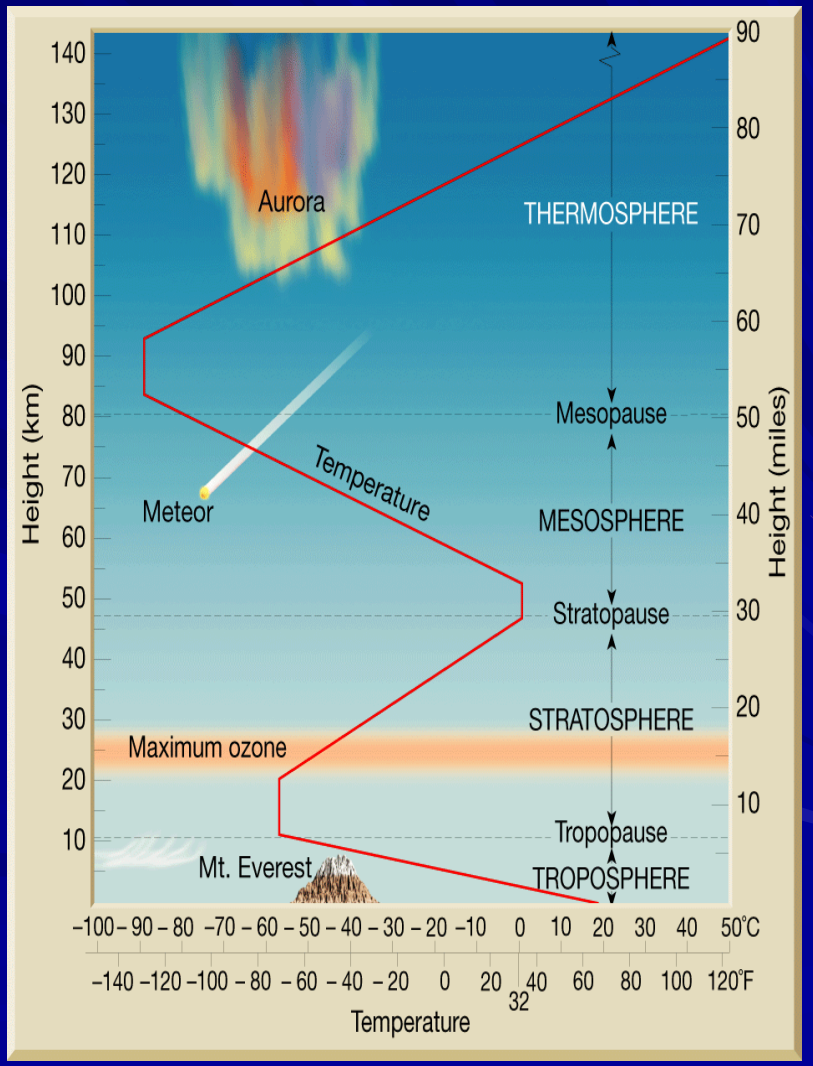
Pressure & Temp Changes

- ***Pressure* Changes:**
  - ***Increase*** Altitude = ***Decrease*** Pressure
    - **Less Air = Less Pressure**
- ***Temp* Changes:**
  - ***Increase*** Altitude = ***Decrease*** Temp
    - ***Decrease*** Temp = ***Decrease*** Pressure

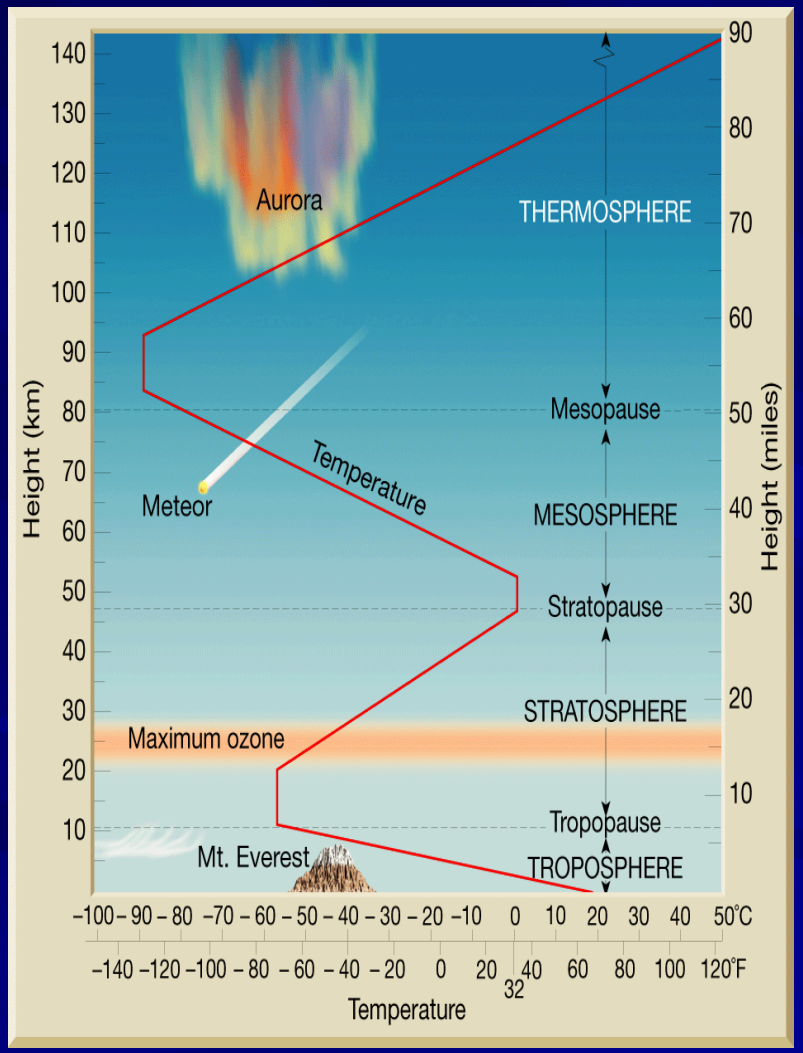


Layers of Atmosphere

- **Troposphere:**
  - Temp ***decreases***
  - Occurrence of most ***weather*** and ***air pollution***
  - ***Upper Tropo*** – ***Airline*** flights



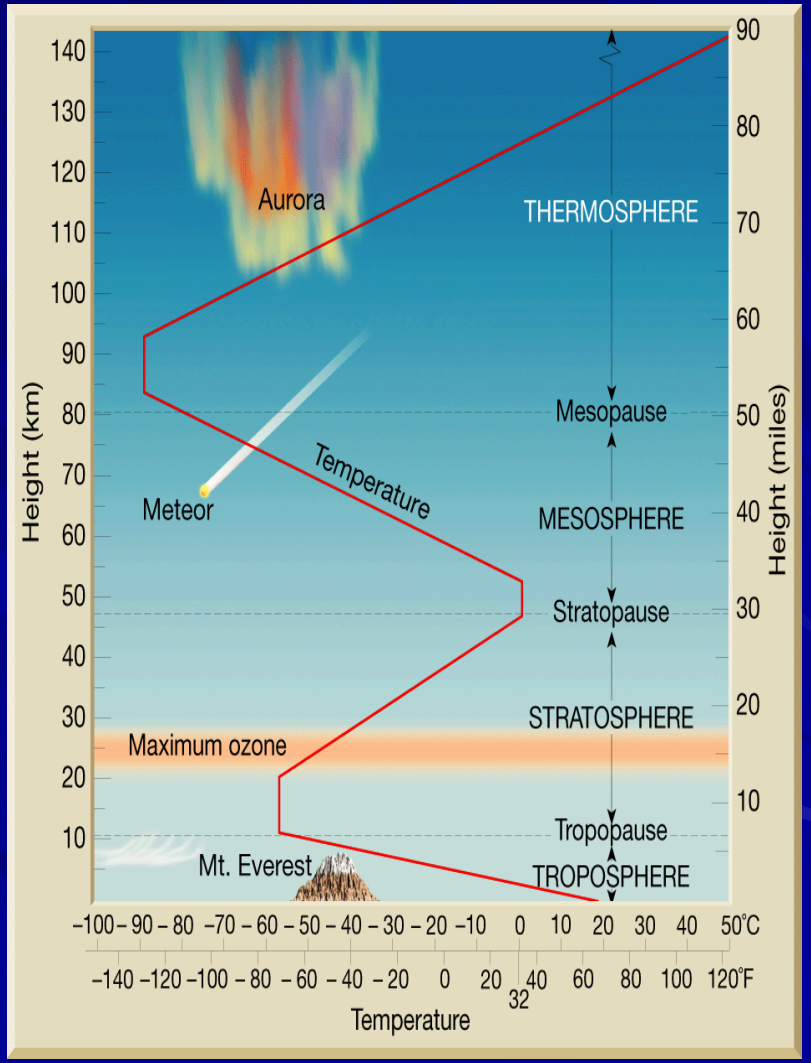
Layers of Atmosphere



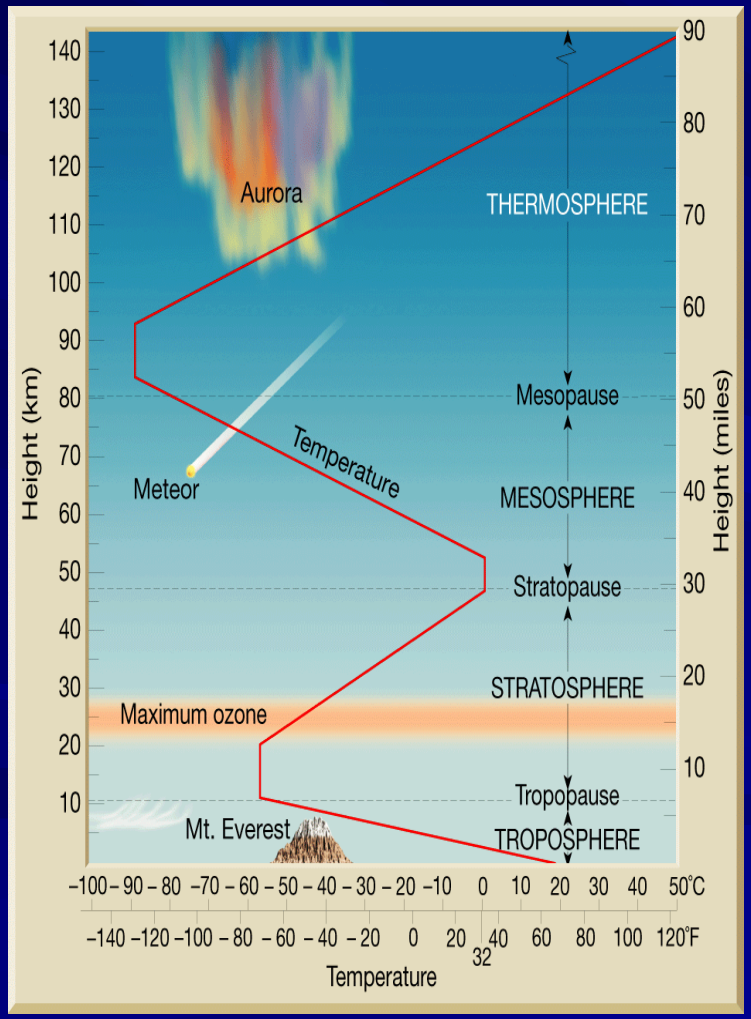
- ***Stratosphere***:
  - Temp ***increases***
  - Layer of ***Ozone (O_3)***
  - **Heated** because Ozone absorbs ***UV radiation*** *and* ***greenhouse gases***

Layers of Atmosphere

- **Mesosphere**:
  - Temp ***decreases***
  - Burn-up of ***comets*** & ***meteor*** showers
  - ***Coldest*** region of atmosphere
  - Air = Very ***thin***



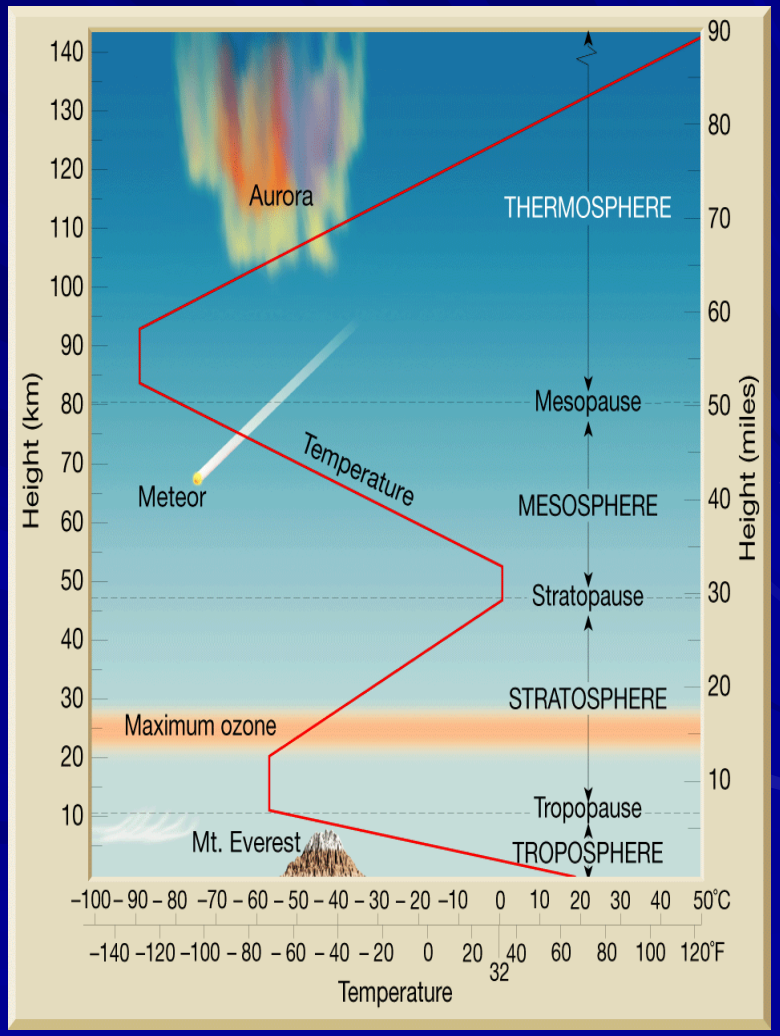
Layers of Atmosphere



- ***Thermosphere***:
  - Temp ***increases***
  - N_2 and O_2 ***absorb*** large amount of high energy ***solar* radiation**
  - Contains ***Aurora Borealis*** & ***satellites***

Layers of Atmosphere

- **Exosphere:**
  - ***Uppermost*** region that fades into vacuum of ***space***
  - Contains ***light*** gases
    - ***helium*** & ***hydrogen***
  - ***Space shuttle*** orbit (outer space)

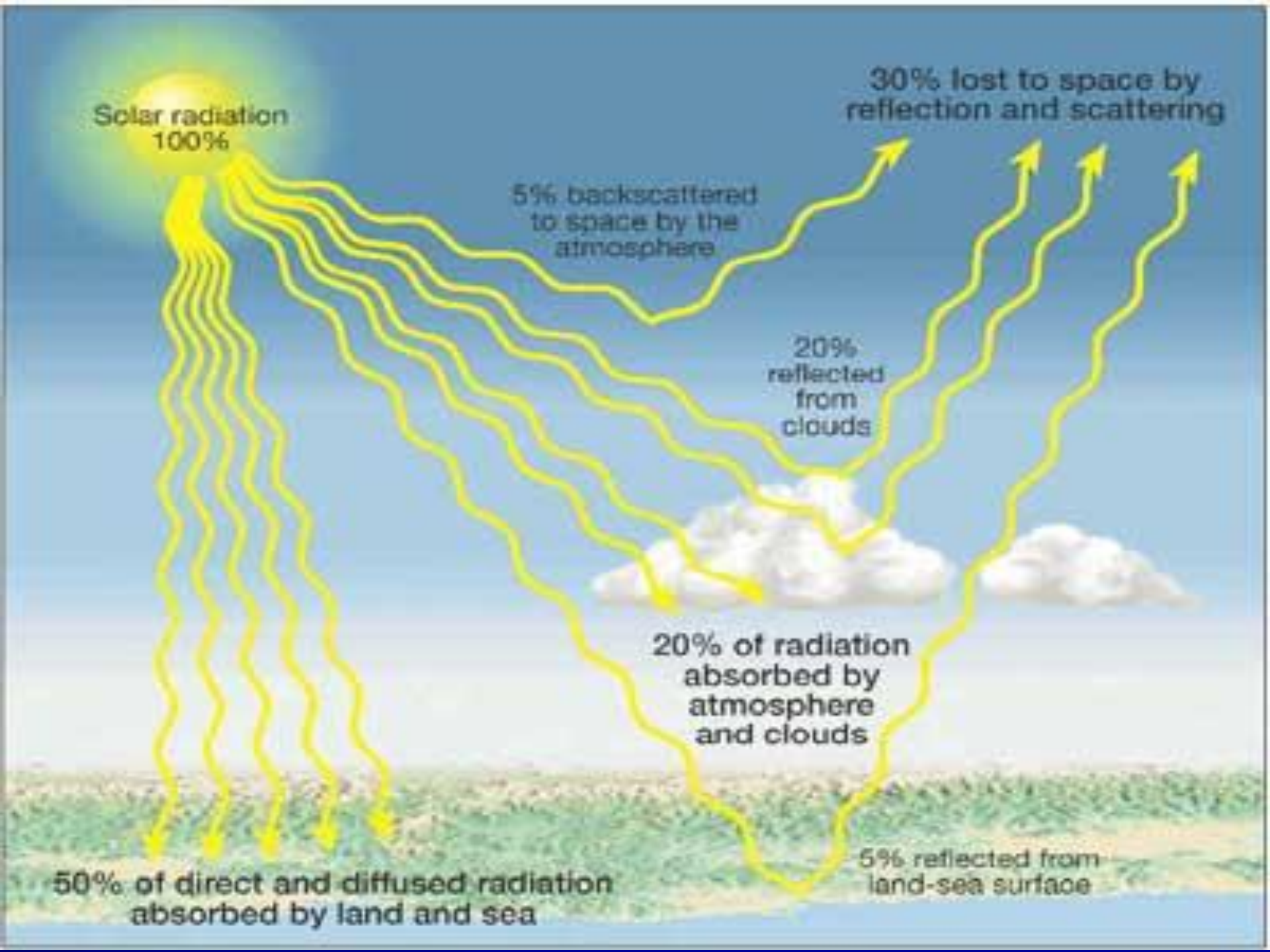


Reflection vs Scattering

- ***Absorption*** – Sunlight encounters atmospheric ***matter*** and is ***"taken in"***

- ***Reflection*** – Sunlight encounters atmospheric ***matter*** and ***"bounces"*** back to ***space***

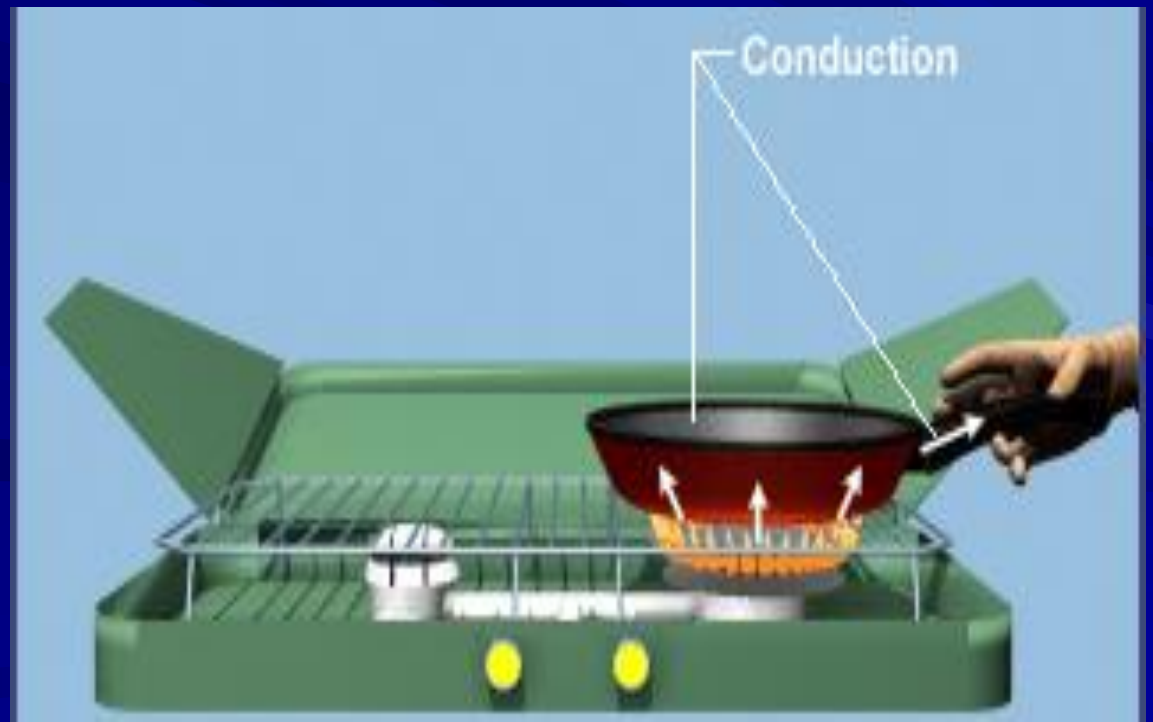
- ***Scattering*** – Sunlight encounters atmospheric ***matter*** and is ***"re-emitted"*** in ***ALL*** directions


Solar radiation
100%
30% lost to space by
reflection and scattering
5% backscattered
to space by the
atmosphere
20%
reflected
from
clouds
20% of radiation
absorbed by
atmosphere
and clouds
5% reflected from
land-sea surface
50% of direct and diffused radiation
absorbed by land and sea

Temperature Effects

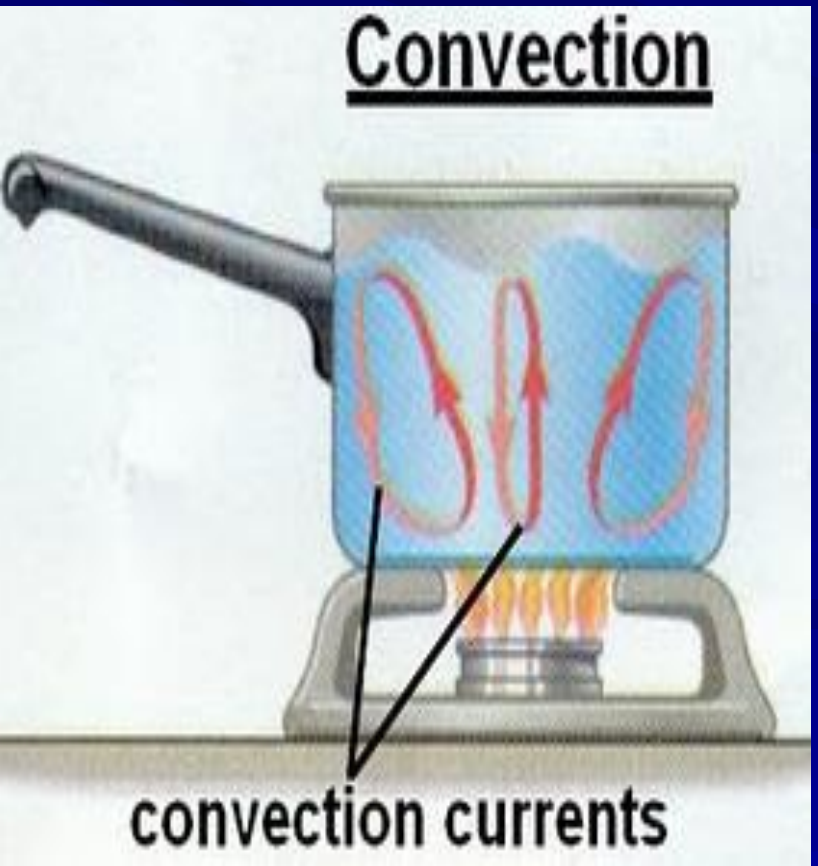
CONDUCTION

– Heat ***transfer*** through ***physical contact***



Temperature Effects

CONVECTION



- Heat ***transfer*** by ***circulation*** of currents through ***water***, ***air***, & ***magma***

Temperature Effects

RADIATION

- Heat ***transfer*** that travels in ***all directions***
  - Energy from **Sun** through ***space***