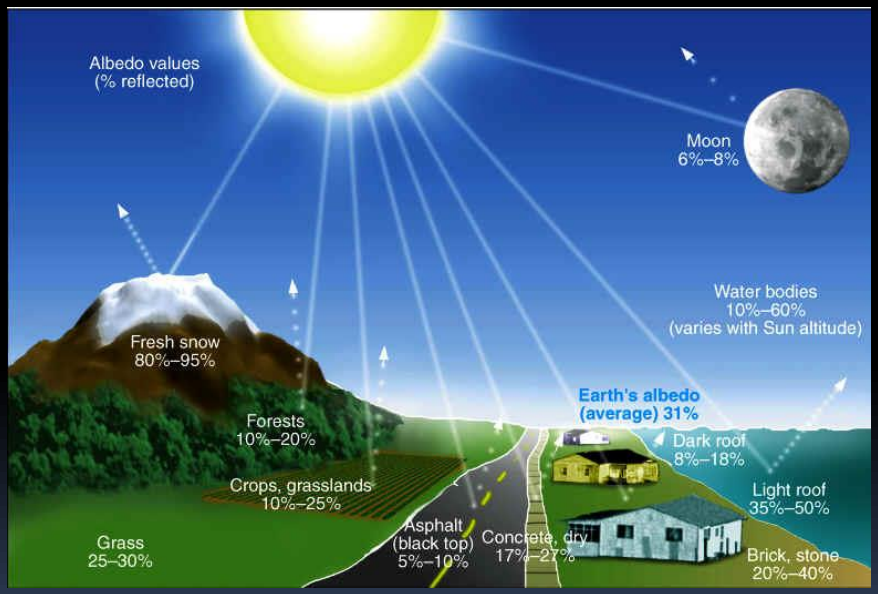
Unit 5: Ch 17.3

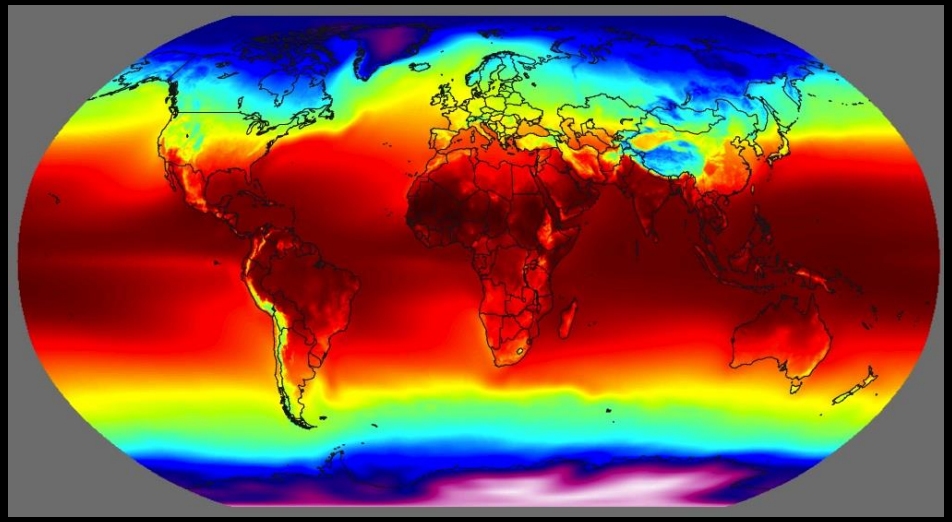
TEMPERATURE CONTROLS

FACTORS OF TEMPERATURE CHANGE

- Latitude
- Heat Capacity
- Specific Heat
- Land vs Water
- Ocean Currents
- Geography
- Altitude
- Cloud Cover



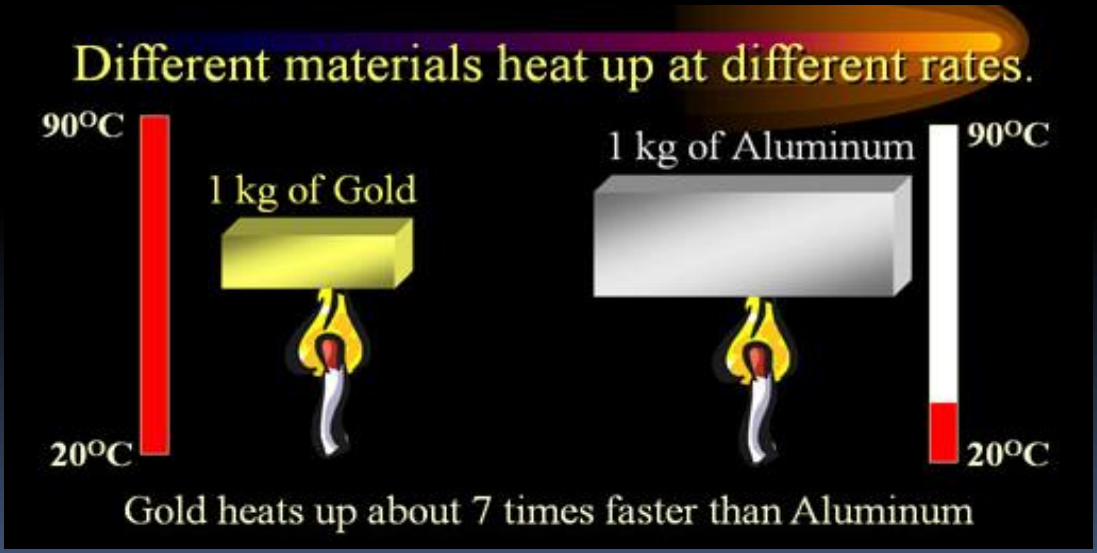
Latitude



- Affects ***angle*** of Sun's rays and ***length*** of daylight
  - Allows **warmer** ***tropic*** & **colder** ***polar*** temps

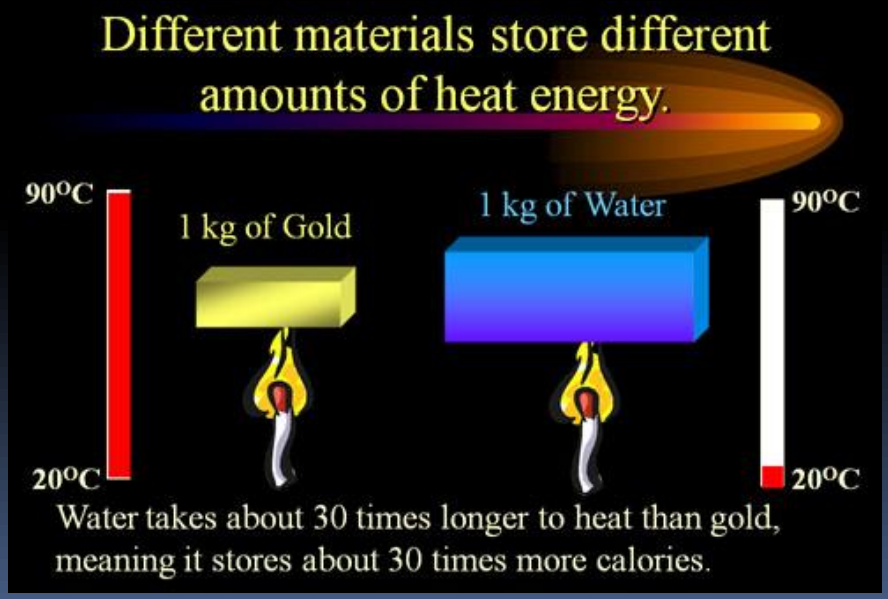
Heat Capacity

- ***Quantity*** of **heat** needed to raise ***temp*** of **ANY** object by ***1° C***



Specific Heat

- ***Quantity*** of **heat** needed to raise ***temp*** of ***1 gram*** of **ANY** object by ***1° C***



Specific Heat of Common Substances

Substance	J/(g*° C)	cal/(g*° C)
Water	4.18	1.00
Grain Alcohol	2.4	0.58
Ice	2.1	0.50
Steam	1.7	0.40
Aluminum	0.90	0.22
Iron	0.46	0.11
Silver	0.24	0.057
Mercury	0.14	0.033

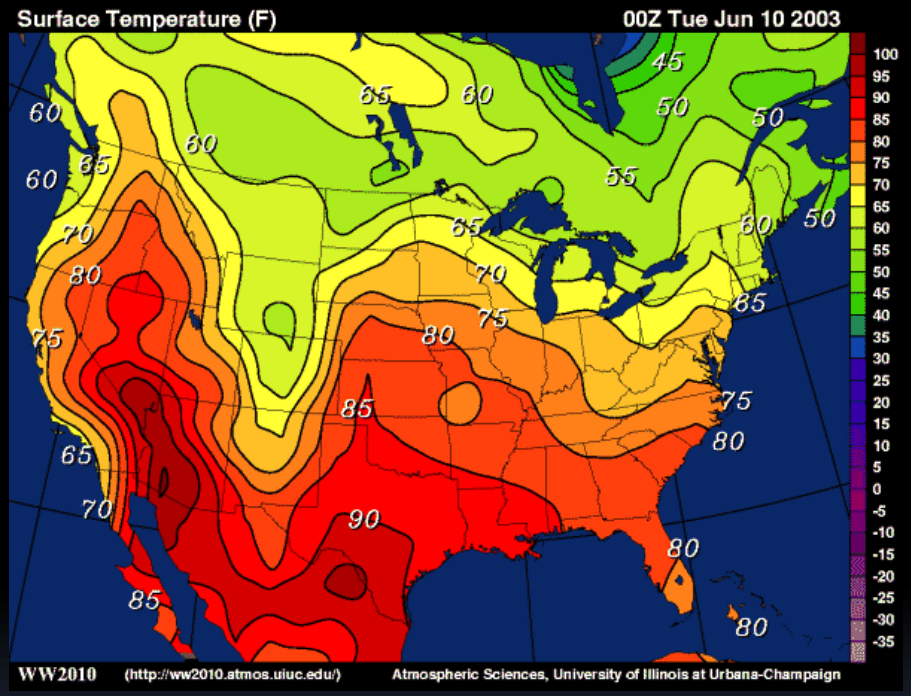
Land vs Water

- Heating of Earth's ***surface*** controls **air temp** above it
  - ***Land*** ***heats*** up ***quicker*** **and** to ***higher*** temp than water

Land vs Water

- ***Land*** also ***cools*** ***quicker*** **and** to ***lower*** temp than water
  - Temp ***variations*** ***greater*** over ***land*** than water

Ocean Currents



- ***Isotherms*** – Points on ***weather*** map of ***EQUAL*** temps

Geographic Position

- ***Windward*** coast ***(Ocean → Shore)*** experiences ***ocean*** temps
  - ***Cool*** summers and ***mild*** winters

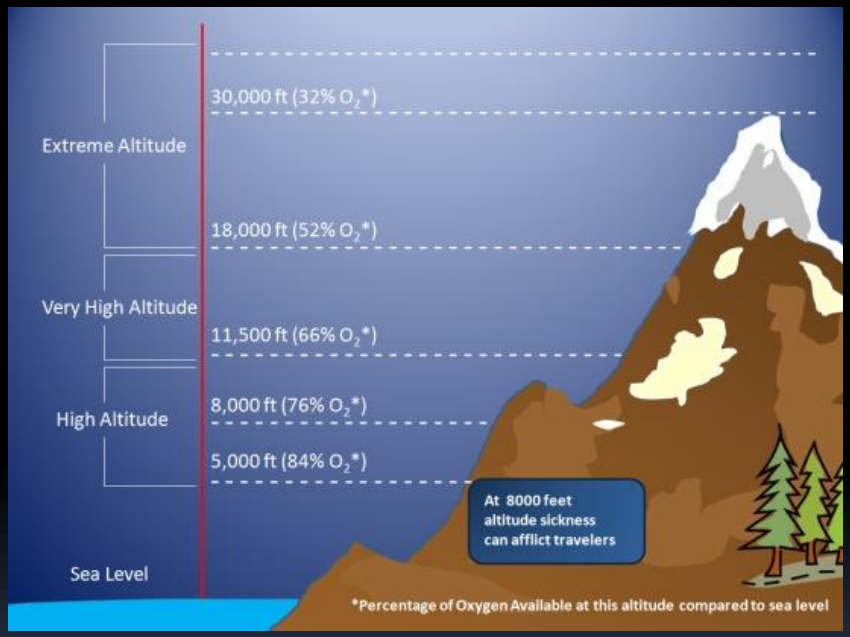
Geographic Position

- ***Leeward*** coast ***(Shore → Ocean)*** experiences ***continental*** temp

Geographic Position

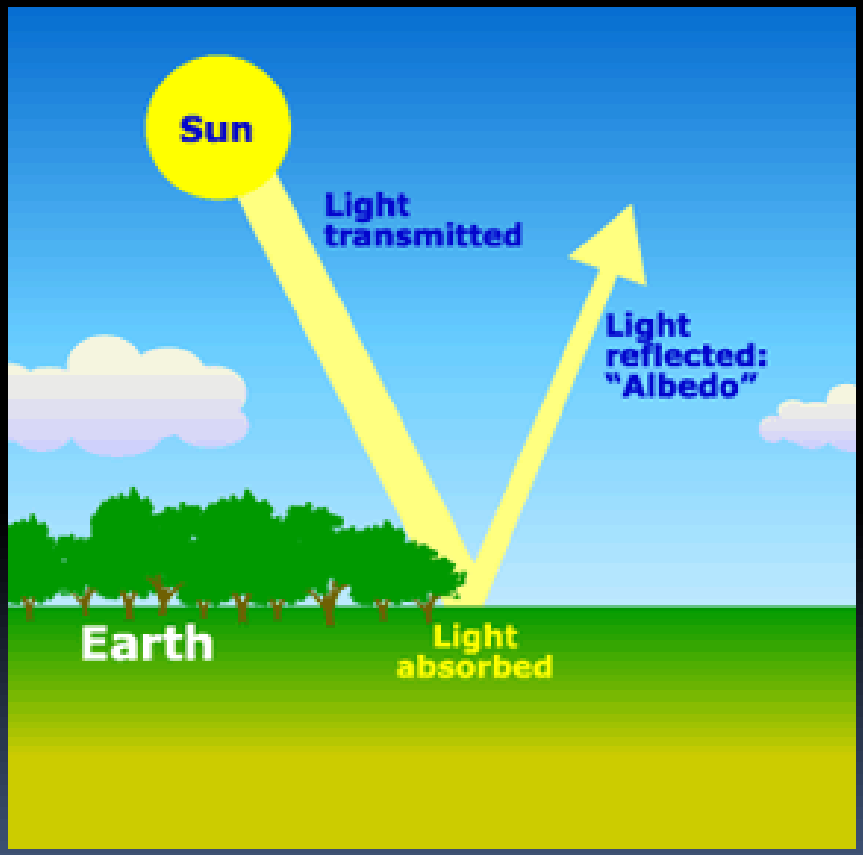
- Coastal ***mountain ranges - Barrier*** from **ocean** temp influences

Altitude



- ***Higher*** altitude equals ***colder*** temps

Cloud Cover & Albedo

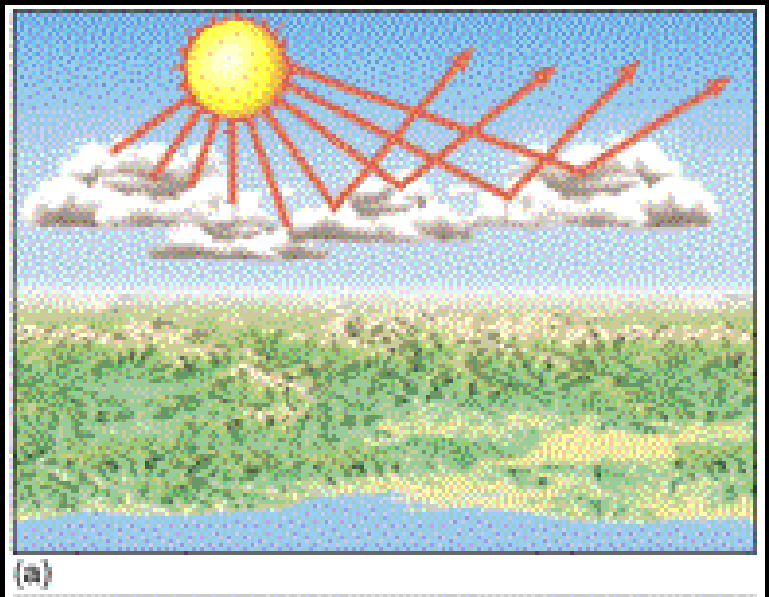


- **Albedo** – **Fraction** of radiation ***reflected*** by any surface
  - **Clouds** have ***high*** albedo

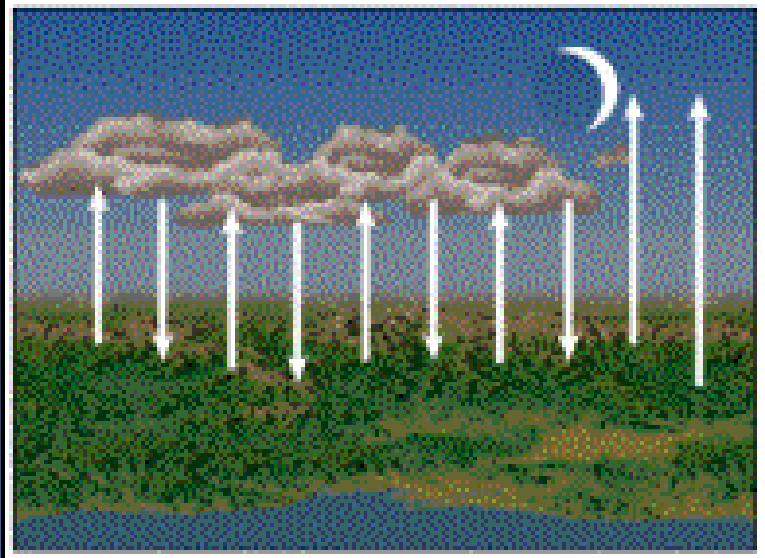
Cloud Cover & Albedo

- **Daylight Clouds** - ***Reflects*** solar ***radiation*** back into space

- **Nighttime Clouds** – ***Absorbs*** radiation emitted **by Earth** ***(blanket effect)***



(a)



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