

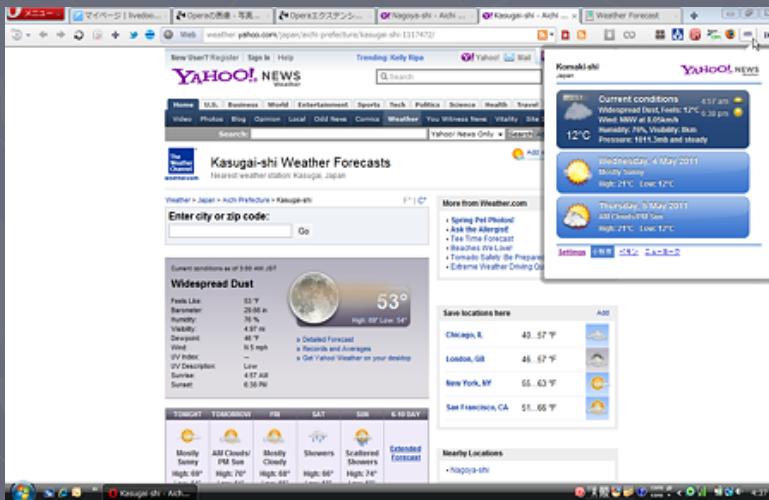
Earth-Sun Relationships and Climate/Climate Regions



Weather vs. Climate

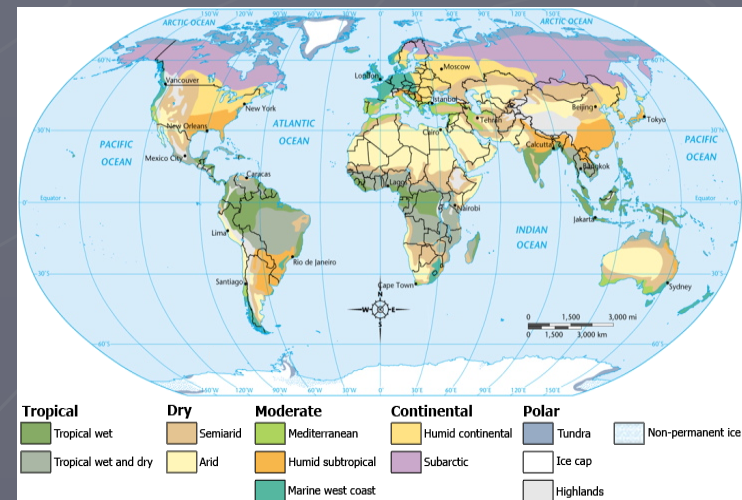
Weather

Conditions of the atmosphere in one place during a limited time.



Climate

Weather patterns that an area typically experiences over a long period of time.



Earth's Tilt

► Rotation

- Spin of Earth on its Axis
- 1 Rotation = 1 Day

► Revolution

- Movement of Earth around the sun
- 1 Revolution = 365 ¼ Days
- Seasons
 - Marked by Solstice & Equinox
 - N & S Hemisphere Difference

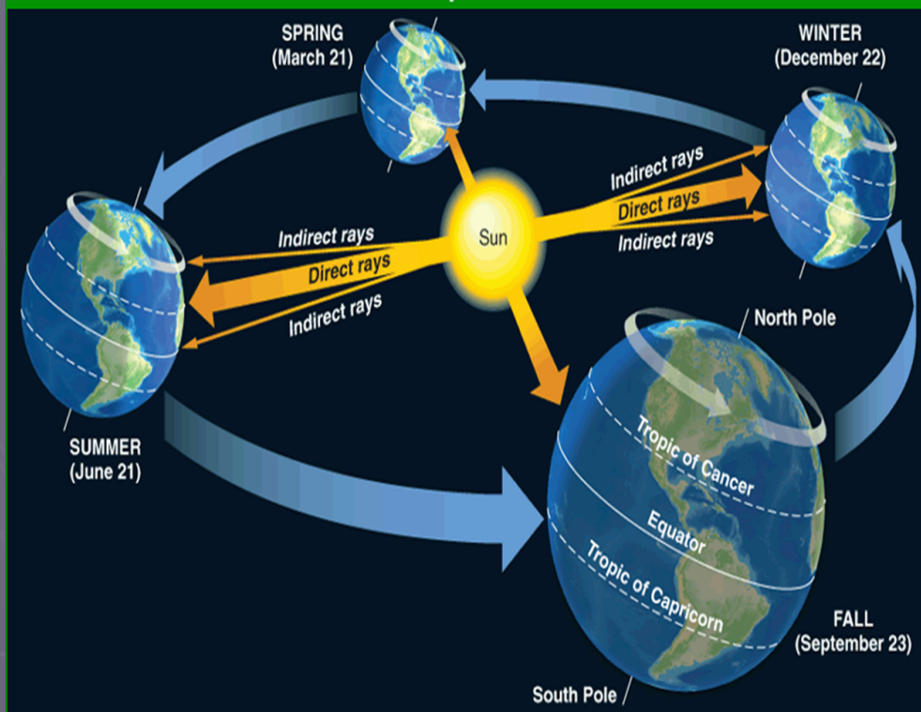


► Tilt

- 23 ½°
- The angle of incline of the earth's axis affects the temperature of a place.
- Longer growing seasons

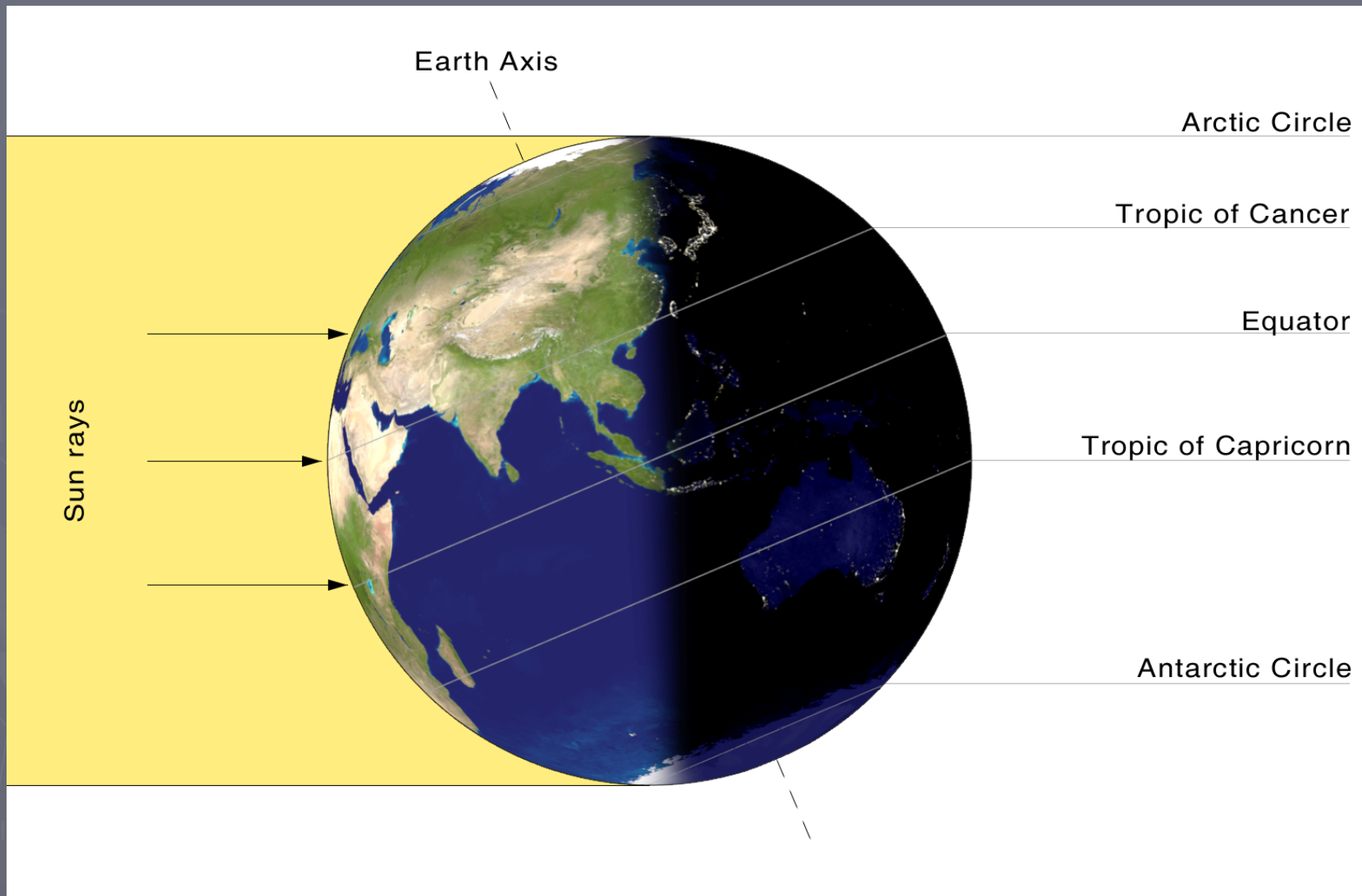
Solstice and Equinox

The Seasons in the Northern Hemisphere



- ▶ Equinox: when the Sun's rays fall directly on the equator, day and night time hours are almost equal (Spring and Fall)
- ▶ Solstice: One of two days (June 21 and December 22) on which the Sun's rays strike directly on the Tropic of Cancer or the Tropic of Capricorn, marking the beginning of summer and winter.
- ▶ Direct rays: When a hemisphere is tilted toward the sun, the direct rays of the sun or angle of incidence is higher and it is summer in that hemisphere.
- ▶ Indirect rays: When a hemisphere is tilted away from the sun, the direct rays of the sun or angle of incidence is lower and it is winter in that hemisphere.

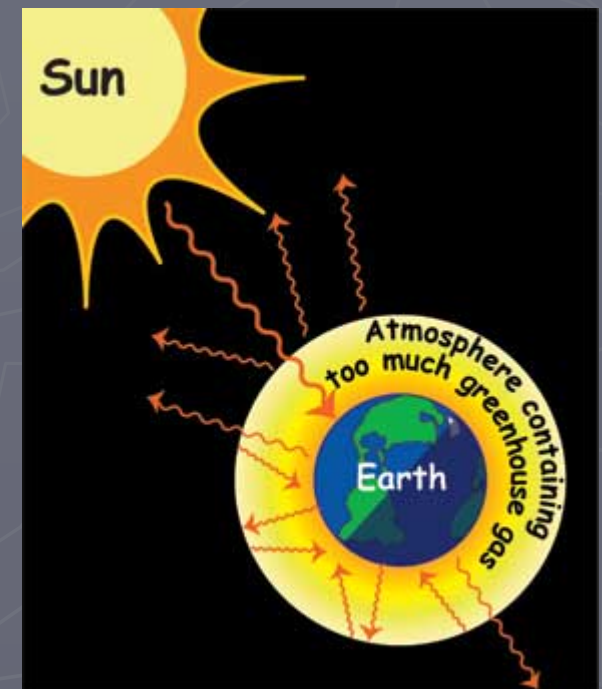
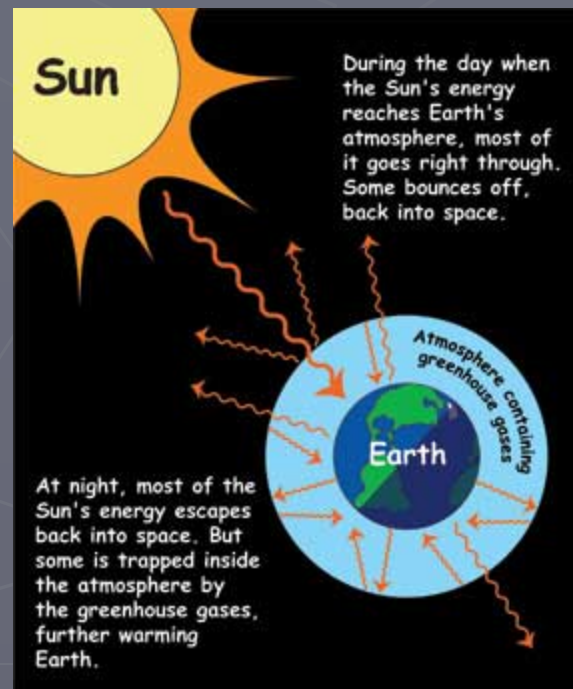
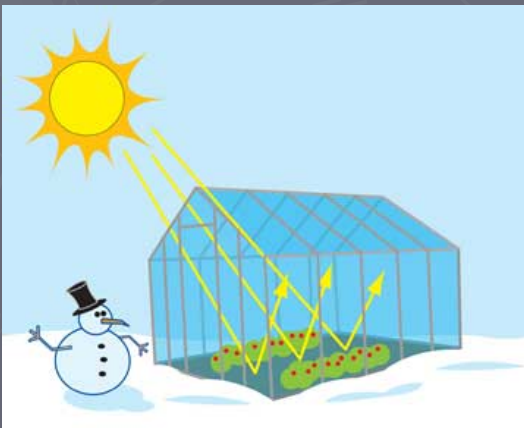
5 Major Circles of Latitude



Greenhouse Effect

- ▶ Natural way for Earth to retain its warmth and for plants and animals to survive.
- ▶ Global Climate Change – refers to the change in climate due to actions by man.

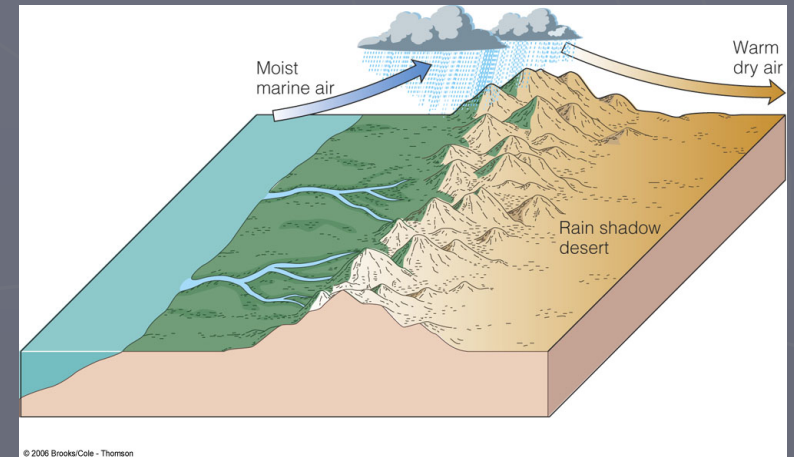
A greenhouse is made of glass. It traps the Sun's energy inside and keeps the plant warm, even in winter.



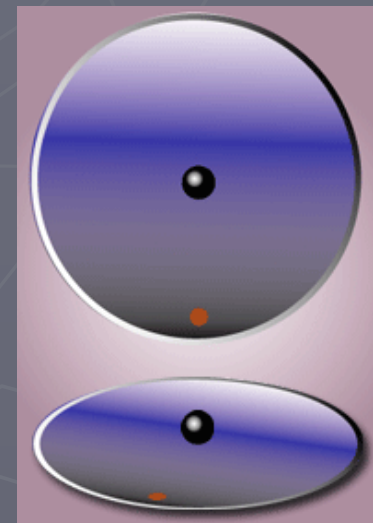
What Affects Climate?

- ▶ Latitude, Latitude, Latitude
- ▶ Landforms (location, size, etc.)
- ▶ Elevation
- ▶ Proximity to large bodies of water
 - Water heats and cools slower than does land
 - Milder climates near large bodies of water
 - More extreme climates away from large bodies of water (continental climate).
- ▶ Wind and Currents

Orographic Effect



Coriolis Effect



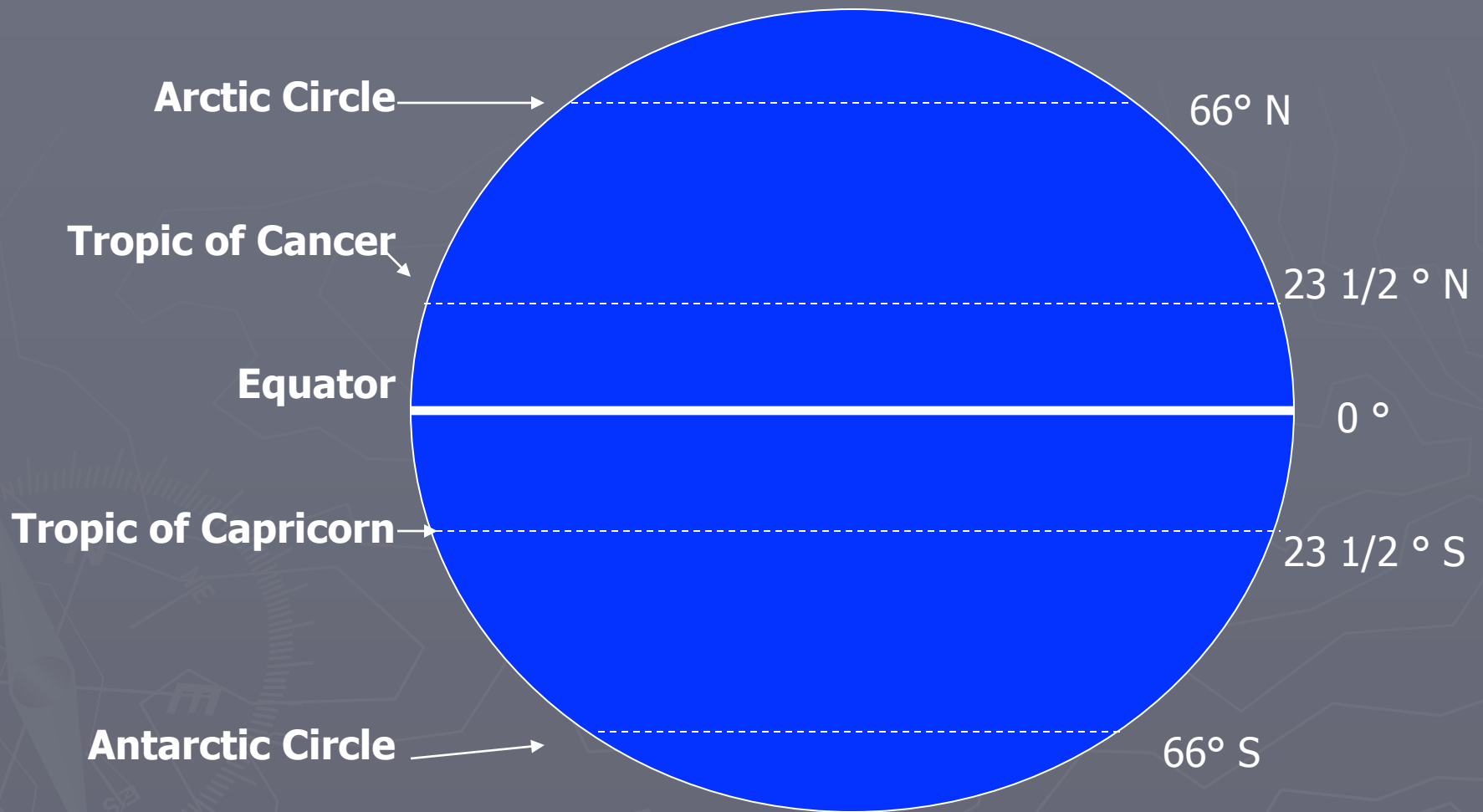
What Affects Climate?

WWEILL...

Latitude, latitude, latitude

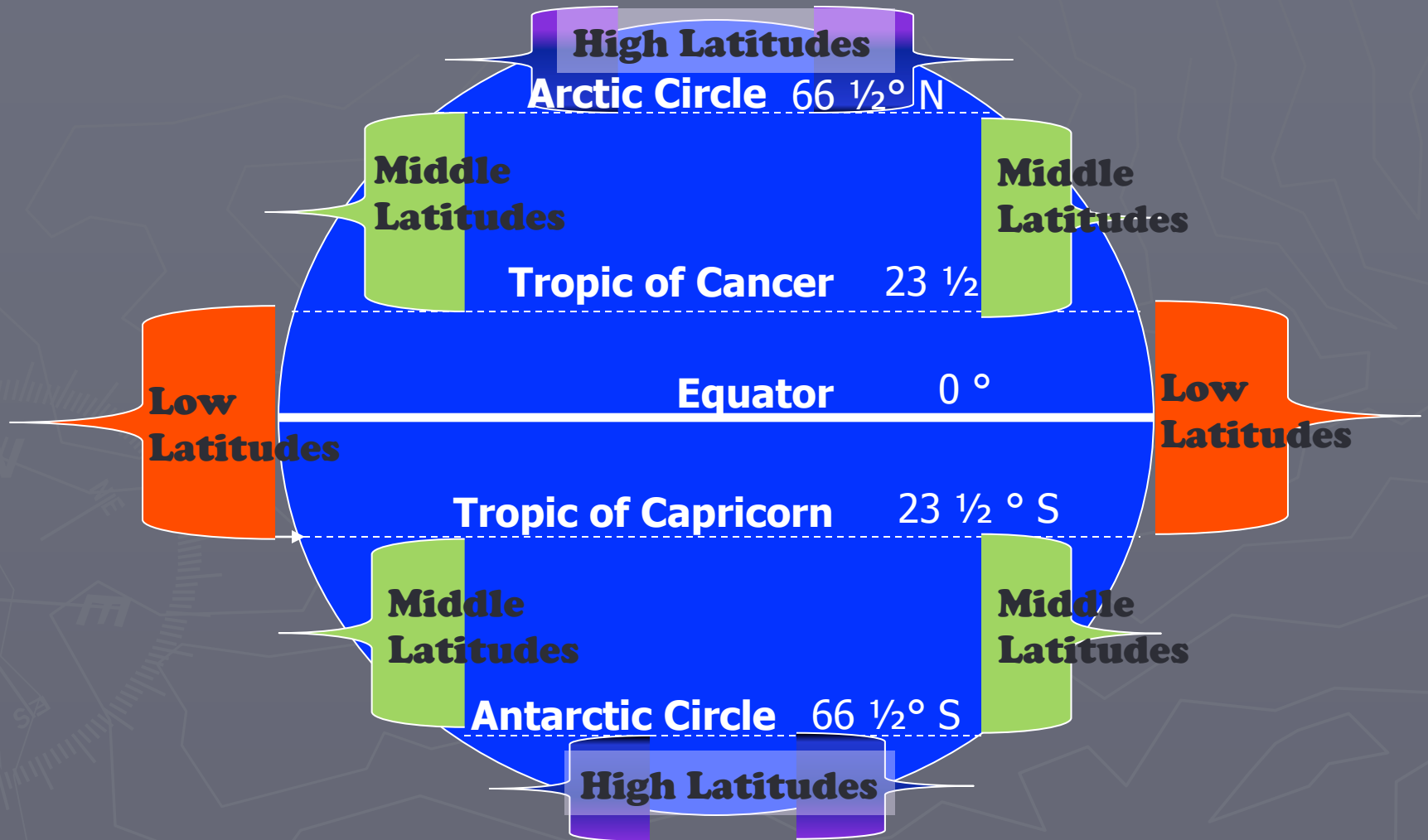
- ▶ Latitude: The most influential factor that affects climate type.
- ▶ There are three latitude zones:
 - Low Latitude- between $23\frac{1}{2}^{\circ}$ N and $23\frac{1}{2}^{\circ}$ S
 - Mid Latitude- between $23\frac{1}{2}^{\circ}$ N and 66° N AND $23\frac{1}{2}^{\circ}$ S and 66° S
 - High Latitude- Poles; above 66° N AND below 66° S

Important Lines of Latitude



Latitude plays a huge part in determining the climate of a place.

Climate Zones Based on Latitude



Low Latitude Climates

	Latitude Range	World Location	Vegetation	Seasons
Tropical Rainforest	10° S to 25 ° N	Amazon basin, equatorial Africa, East Indies, from Sumatra to New Guinea	A canopy of tall trees with layers of shorter trees and plants underneath	Heavy rainfall in all months, no difference in seasons
Tropical Grasslands	15° to 25° N and S	India, Southeast Asia, West Africa, southern Africa, South America, north coast of Australia	Grasses, short trees (Ex. Savanna in Africa)	Warm year round, wet and dry seasons
Desert	18° to 28° N and S, centered on Tropics of Cancer and Capricorn	Western North America (southwest U.S. southwest South America (Chili) north central Mexico, north Africa, southwest Africa, central Australia, north Asia (China, Mongolia)	Scattered vegetation; short grasses and shrubs, cacti	Warm or Cold, little to no precipitation year round

Mid-Latitude Climates

	Latitude Range	World Location	Vegetation	Seasons/ Rainfall
Grasslands	Central areas of continents between 35° and 50° N	Western North America (Great Plains); Central South America, Central Africa (Sahel) (Patagonia) Eurasian interior (Kazakhstan)	Grassland, few trees Steppe: Central Asia Llanos: Central South America Prairie: (North America) Savanna (Africa)	Low precipitation year round, hot summers, cold winters
Humid subtropical	Southeast coast of continents between 20° and 40° N and S	Southeastern North America, Southeastern Asia, Southeastern Australia	Coniferous/Deciduous (Mixed) Forests and grassland	Warm, humid summer, and mild winters precipitation year round
Mediterranean	30° to 50° N and S	The Mediterranean basin, west coasts of California, central Chile, South Africa, western/southern Australia	Shrubs, grasses, and mixed trees (Chaparral)	Long, hot, dry summers, and mild, rainy winters

Mid-Latitude Climates

	Latitude Range	World Location	Vegetation	Seasons/ Rainfall
Humid Continental	30 to 55 N and S, to 60 N in Europe	North central North America; north central Asia (China); Korea; Japan; central and eastern Europe	Mixed coniferous and deciduous forest	Warm summer cold winters, moderate rainfall throughout the year
Marine-West Coast	30 to 60 N and S	West coast of N. America, west coast of southern Chile, and northwestern Europe	Mixed coniferous and deciduous forests	Cool summers, mild winters, high rainfall year round

High Latitude Climates

	Latitude Range	World Location	Vegetation	Seasons/ Rainfall
Subarctic	50° to 60° N	Northern North America and Eurasia	Coniferous forests - taiga	Extremely cold winter, short, cool summer
Arctic	60° to 70° N	Northern North America and Eurasia	Short grasses, mosses, lichens, tundra	Extremely cold and dry all year

Other Climates

	Latitude Range	World Location	Vegetation	Seasons/Rainfall
Highland	Found all over the world	Mountain Ranges: Himalayas, Andes, Rockies, Alps, etc.	Varies with elevation and location on mountain. Leeward side is drier with less vegetation.	Windward side receives the most rainfall while leeward side remains dry.