

# Weather & Climate #9

Identify factors that affect climate (i.e. latitude, altitude, prevailing wind currents, amount of solar radiation, location with respect to mountain ranges)

(Review)

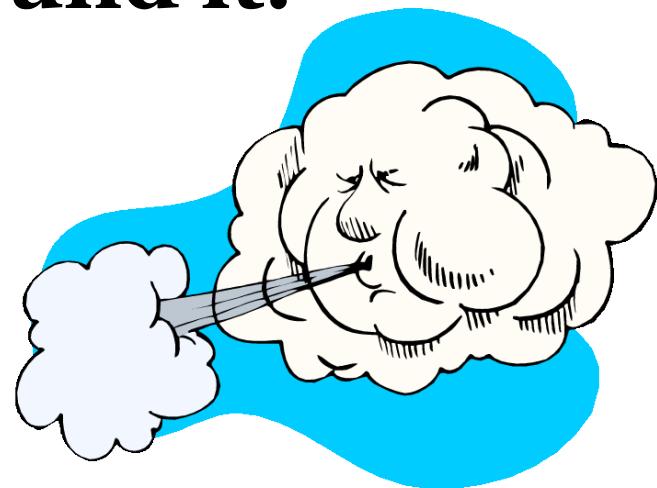
## Climate:

- **The average, year-after-year conditions of temperature, precipitation, winds, and clouds in an area.**



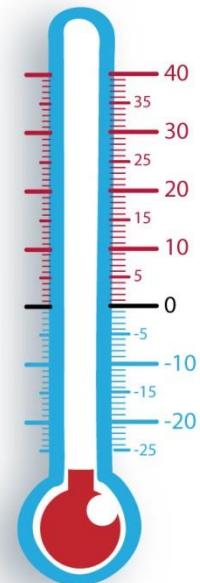
# Microclimate:

- **A small area with climate conditions that differ from those around it.**



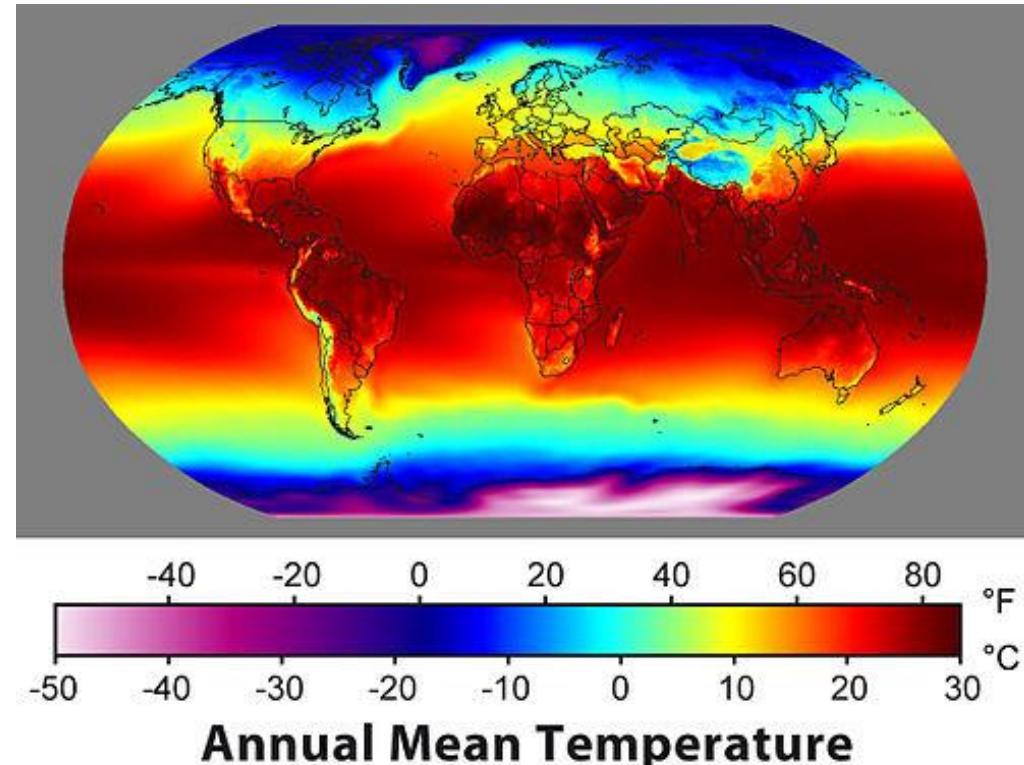
# Temperature:

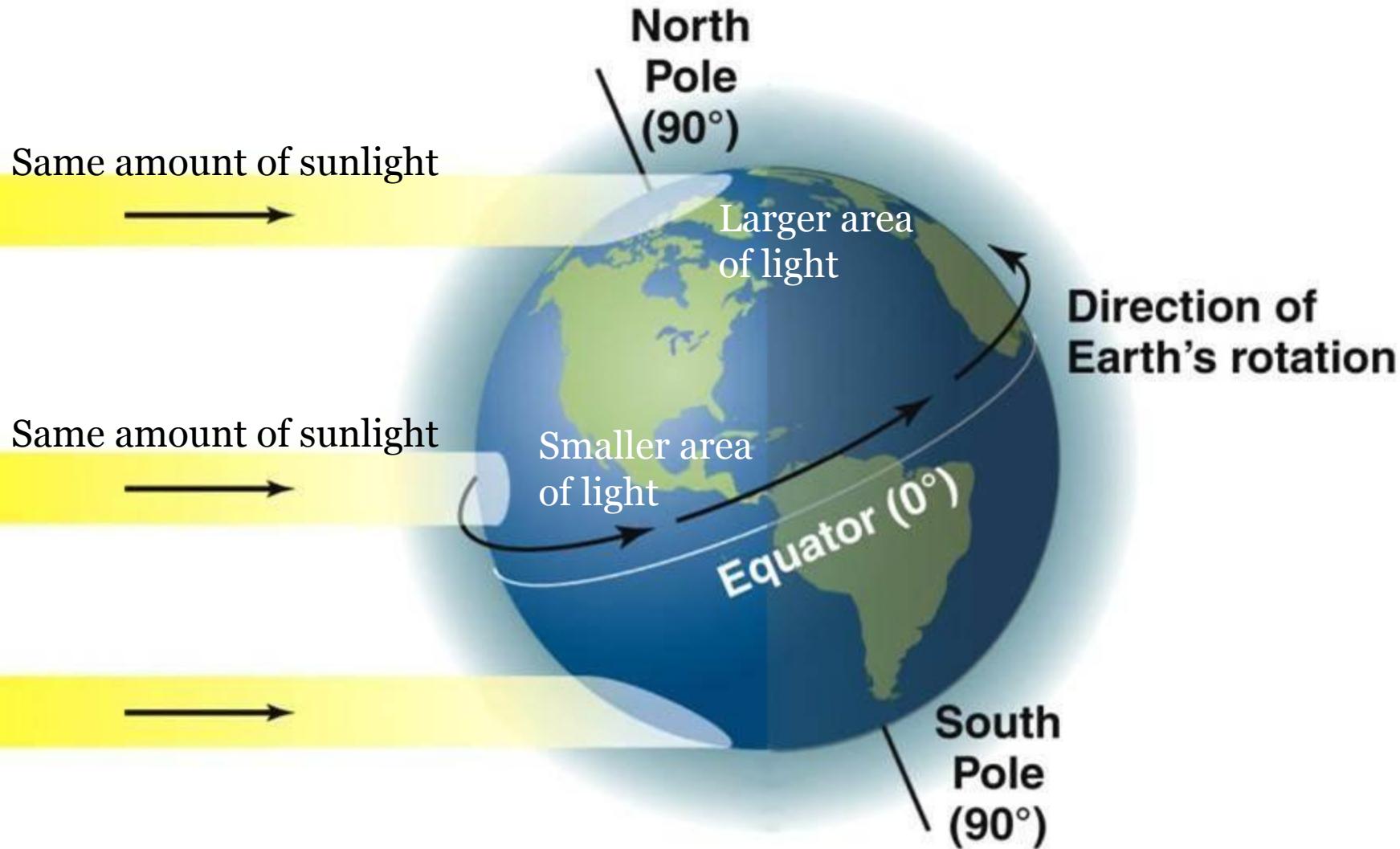
- The main factors that influence temperature are latitude, altitude, distance from large bodies of water, and ocean currents.



# Latitude

- The Sun's rays hit Earth's surface more directly at the equator.
- **This makes climates of areas near the equator warmer and climates near the poles cooler.**

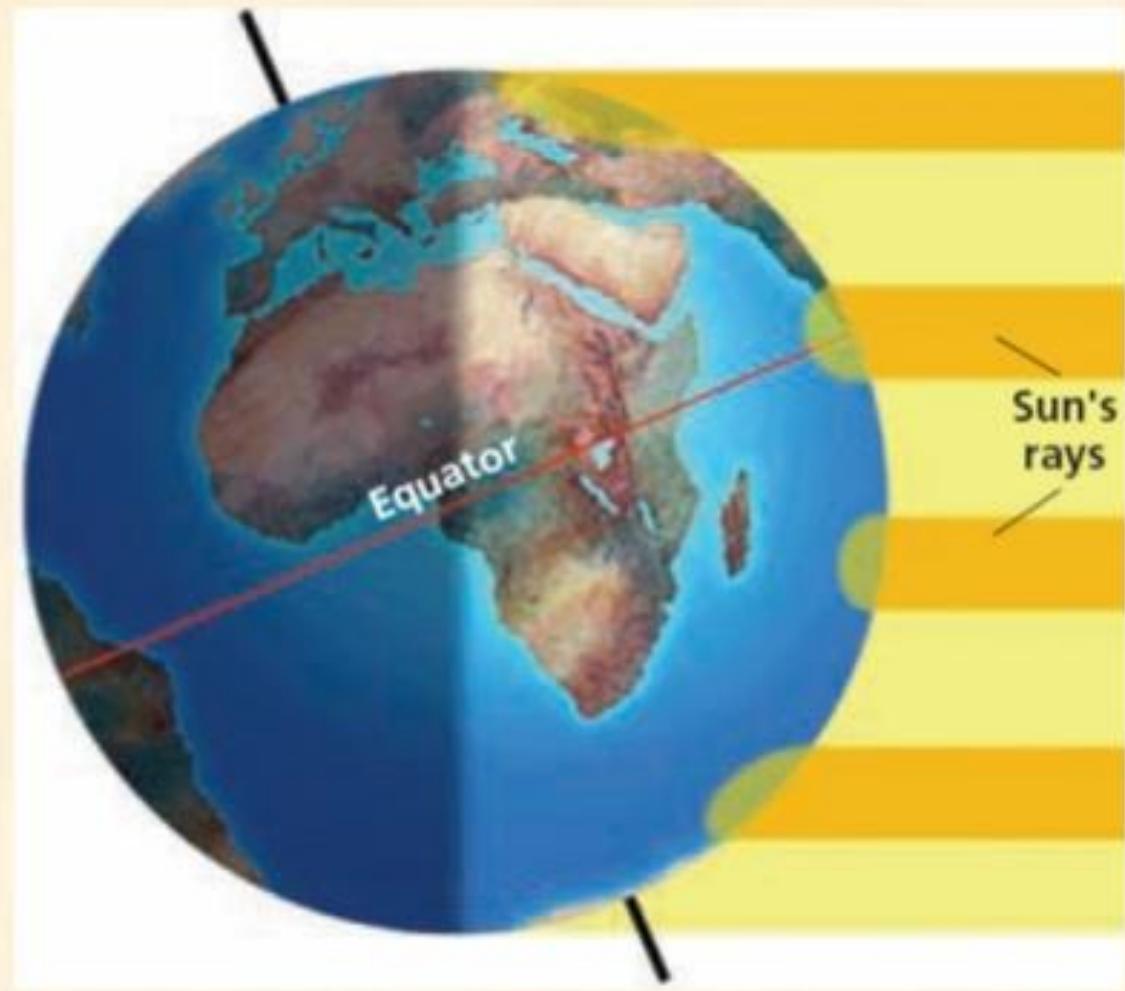




The same amount of sunlight spreads over a larger area near the poles than near the equator. When spread over a larger area, the insolation per unit area is decreased, leading to cooler temperatures away from the equator.

You know that the Sun hits the Equator more directly.

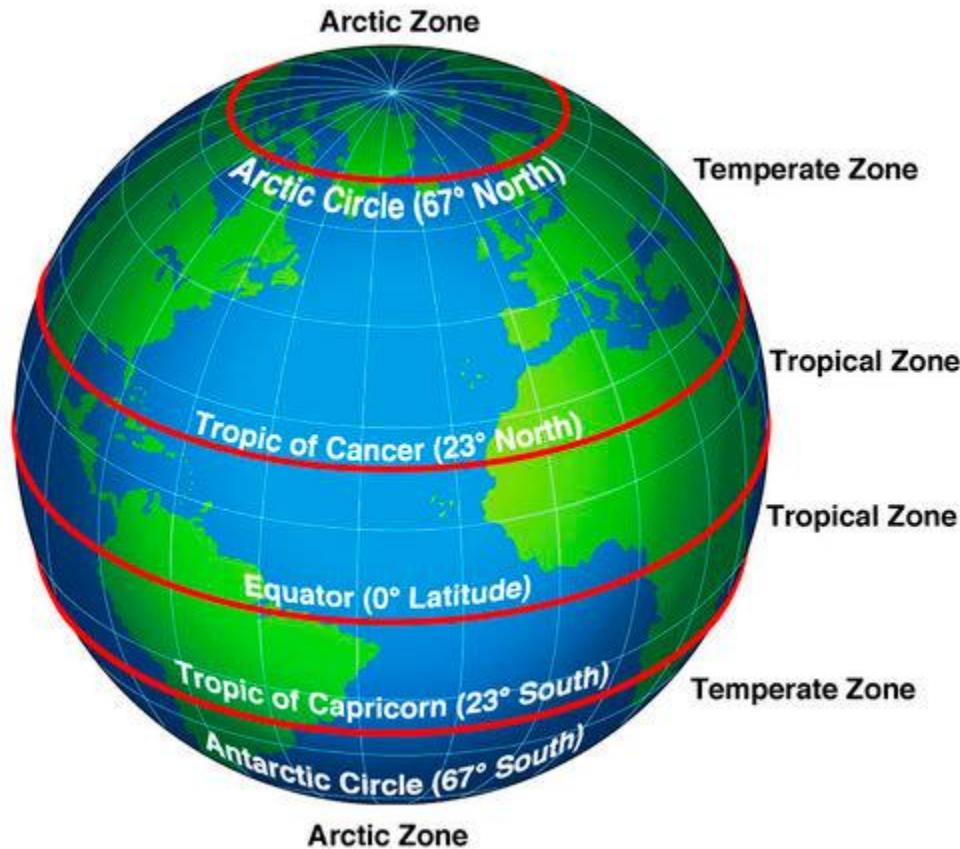
What effect do you think this might have on the CLIMATE of areas near the Equator?



# How does latitude affect climate?

- The closer you are to the equator, the warmer it is. The farther you travel from the equator, the colder it is. This is because the equator gets more direct sunlight.

- **Latitude** is the distance away from the equator, measured in degrees.
- Based on Latitude, Earth's surface can be divided into 3 temperate zones.



## World Temperature Zones



# Temperate Zones:

- **Tropical Zone:** near the equator, between  $23.5^{\circ}\text{N}$  and  $23.5^{\circ}\text{S}$ . This zone receives direct or nearly direct sunlight all year round, making the climate there warm.
- **Polar Zones:** extends from about  $66.5^{\circ}$  to  $90^{\circ}$  north and  $66.5^{\circ}$  to  $90^{\circ}$  south.
- **Temperate Zones:** located in between the tropical and polar zones. Weather in the temperate zones ranges from warm/hot in the summer to cool/cold in the winter.

# Altitude

- The higher up you go, the colder it gets.



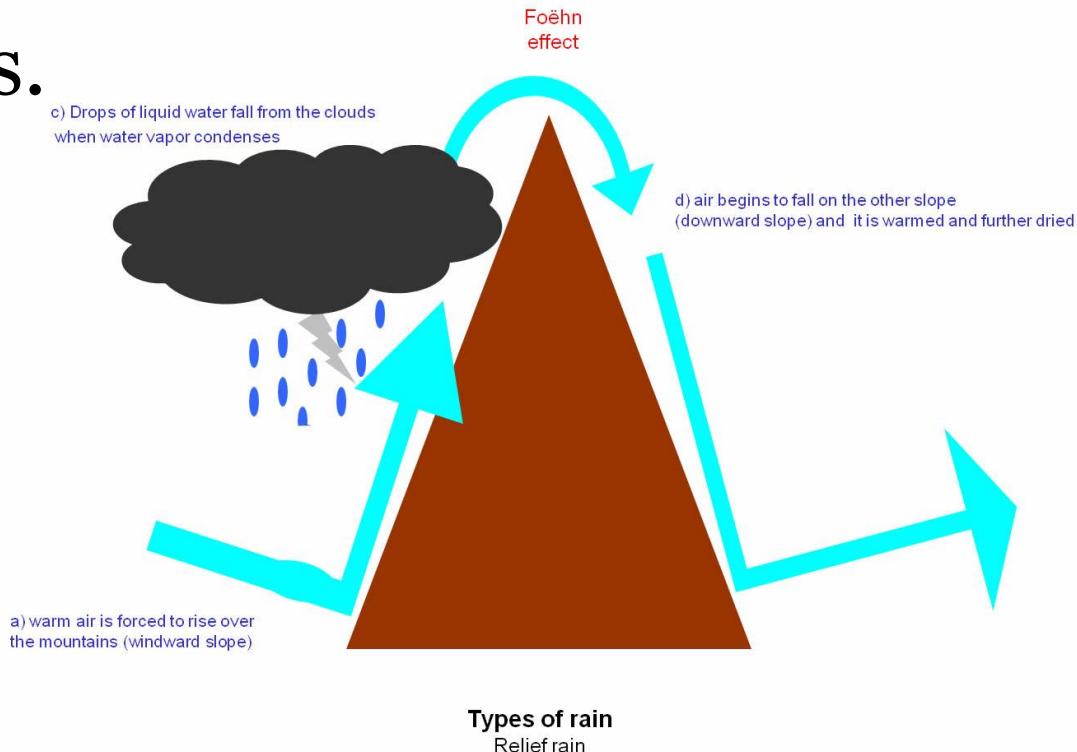
- How is weather different at the top of a mountain than it is at the bottom?

# How does altitude affect climate?

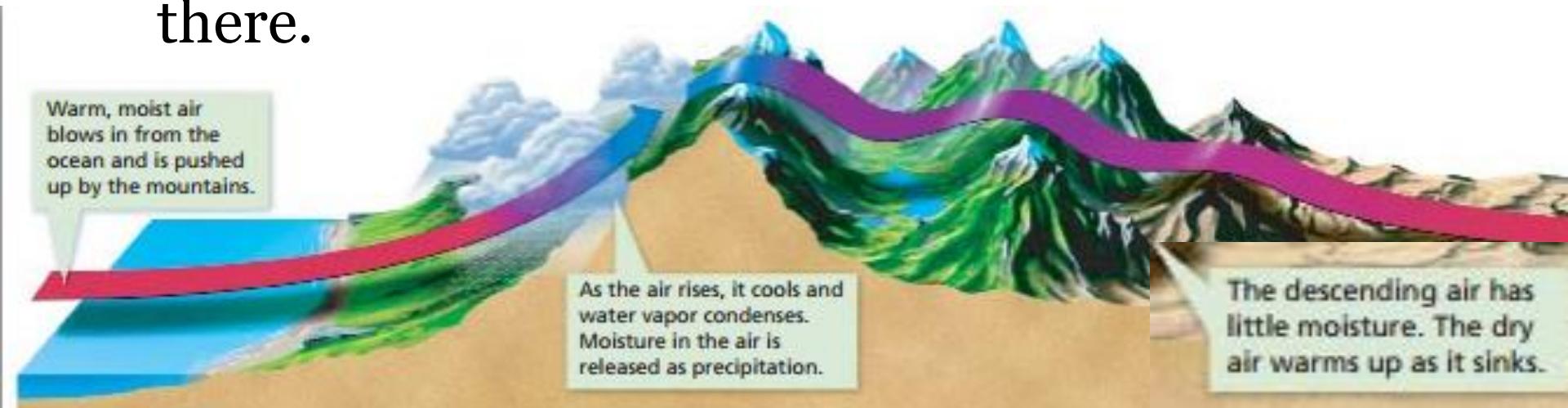
- The farther away from sea level you go (farther up), the colder it gets.

# Mountain Ranges:

- A mountain range in the path of prevailing winds can also influence where precipitation falls.



- Rain or snow falls on the **windward** side (upwind side) of the mountain.
- Humid air cools as it is blown up the side of the mountain, then condensation and precipitation occur.
- The land on the **leeward** side (downwind side) is in a rain shadow so little precipitation falls there.



# Distance From Large Bodies of Water

- Oceans help to moderate temperatures of nearby land.
- Water heats up and cools down slower than land. Therefore, winds off the ocean often prevent extremes of hot and cold in coastal regions.



# How does location to large bodies of water affect temperature?

- Large bodies of water help to moderate the temperature of the areas near by.

Review:

What does marine mean?

-wet/humid

What does continental mean?

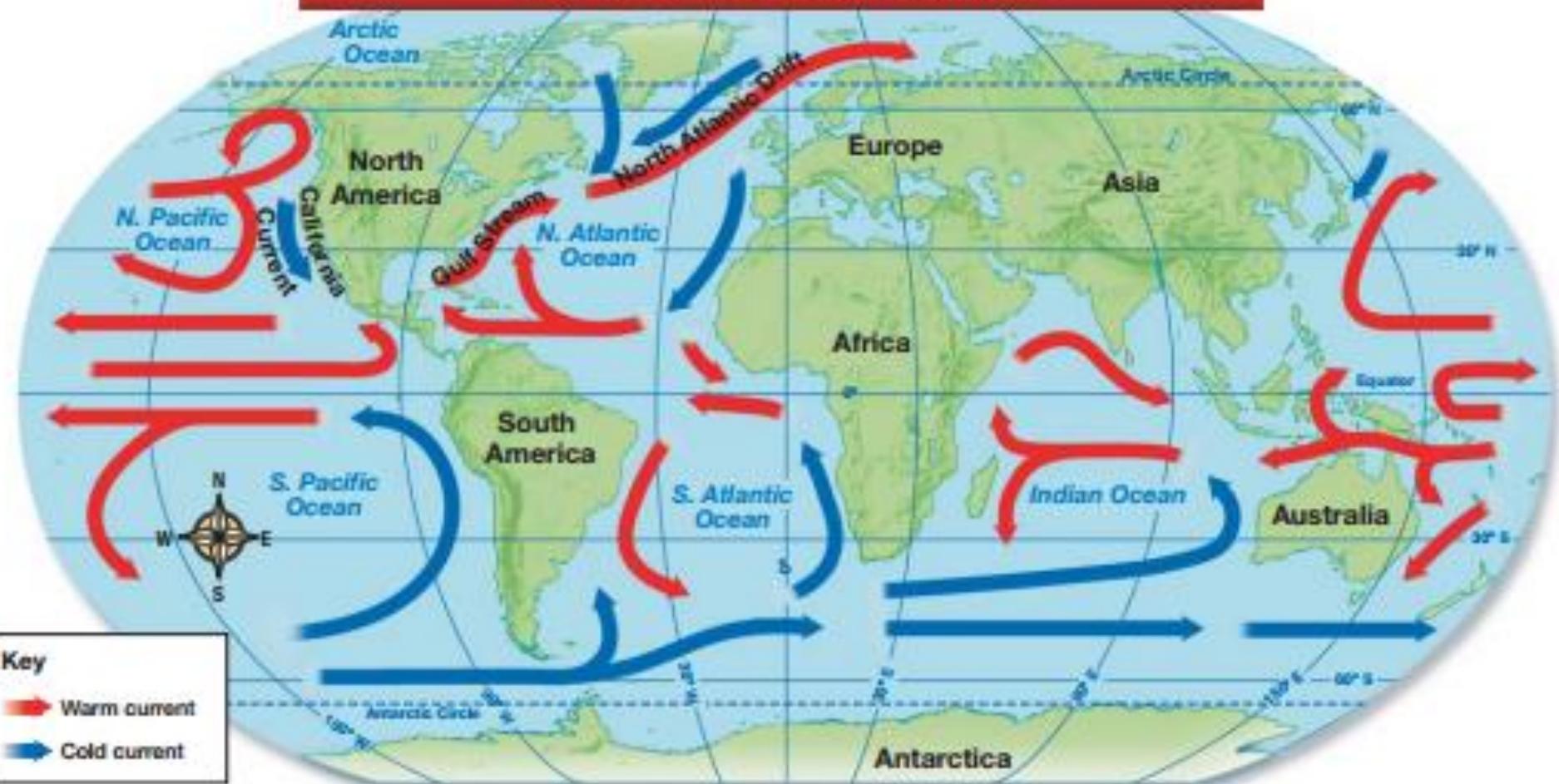
-dry

- **Marine Climates:** occur at areas close to large bodies of water. Create mild winters and cool summers.
- **Continental Climates:** occur at areas that are too far inland to be warmed or cooled by the ocean, like the center of North America and Asia.
- Continental Climates have more extreme temperatures than marine climates. Winters are cold, while summers are hot.

# Ocean Currents:

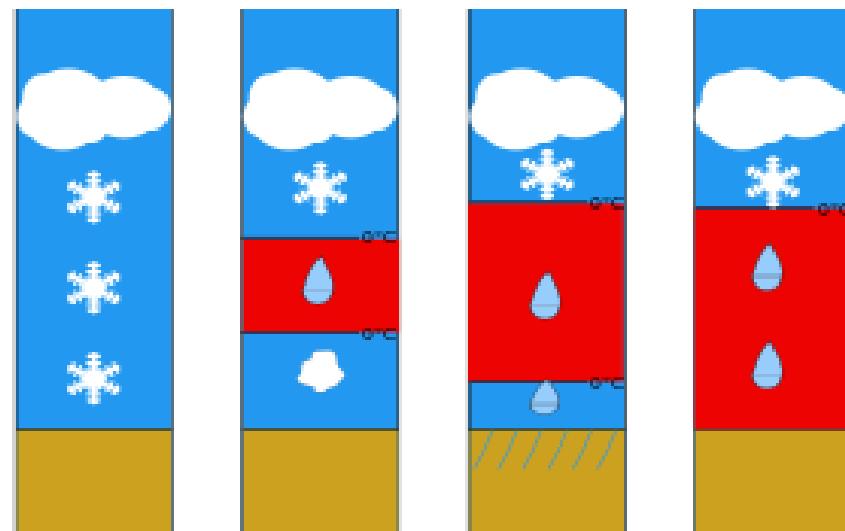
- Are streams of water within the oceans that move in regular patterns.
- **Cold currents bring cool water towards the land, which cools the air above.**
- **Warm currents bring warm water towards land, warming the air above.**

## Major Surface Ocean Currents



# Factors Affecting Precipitation:

- The main factors that affect precipitation are prevailing winds, the presence of mountains, and seasonal winds.



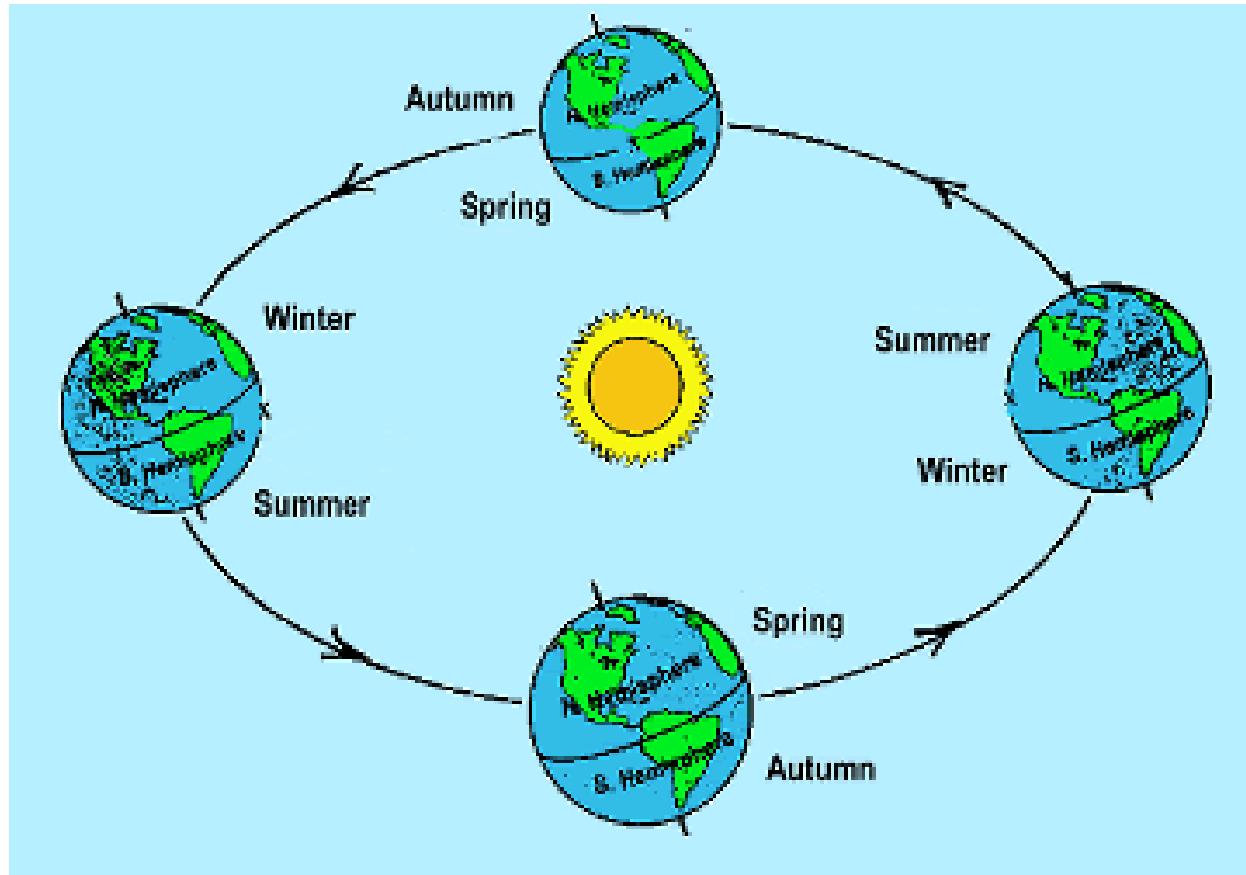
## Prevailing Winds:



- Weather patterns depend on the movement of large air masses.
- Air masses are moved from place to place by prevailing winds.
- Air masses can be warm or cool, dry or humid.
- The amount of water vapor in the air mass influences how much rain or snow will fall.

# Seasons:

- Seasons are caused by the tilt of Earth's axis as Earth travels around the sun.



# Seasons: (Solar Radiation)

- The northern hemisphere where we live experiences summer when it is tilted towards the sun, receiving more direct sunlight.
- The northern hemisphere experiences winter when it is tilted away from the sun, receiving less direct sunlight.

# W&C #9 Review:

# Label the Temperate Zones:

