



Understanding

Latitude & Longitude

>> Notes Page: Latitude and Longitude

-We use latitude and longitude to find a particular location on Earth

The horizontal **Latitude** lines are also known as **parallels** and are an equal distances from each other. Degrees **latitude** are numbered from 0° to 90° north and south. Zero degrees is the **equator**, the imaginary line which divides our planet into the northern and southern hemispheres.

The vertical **longitude** lines converge at the poles and are widest at the equator. Zero degrees longitude known as the **Prime Meridian** is located at Greenwich, England (0°). The degrees continue 180° east and 180° west where they meet and form the **International Date Line** in the Pacific Ocean.

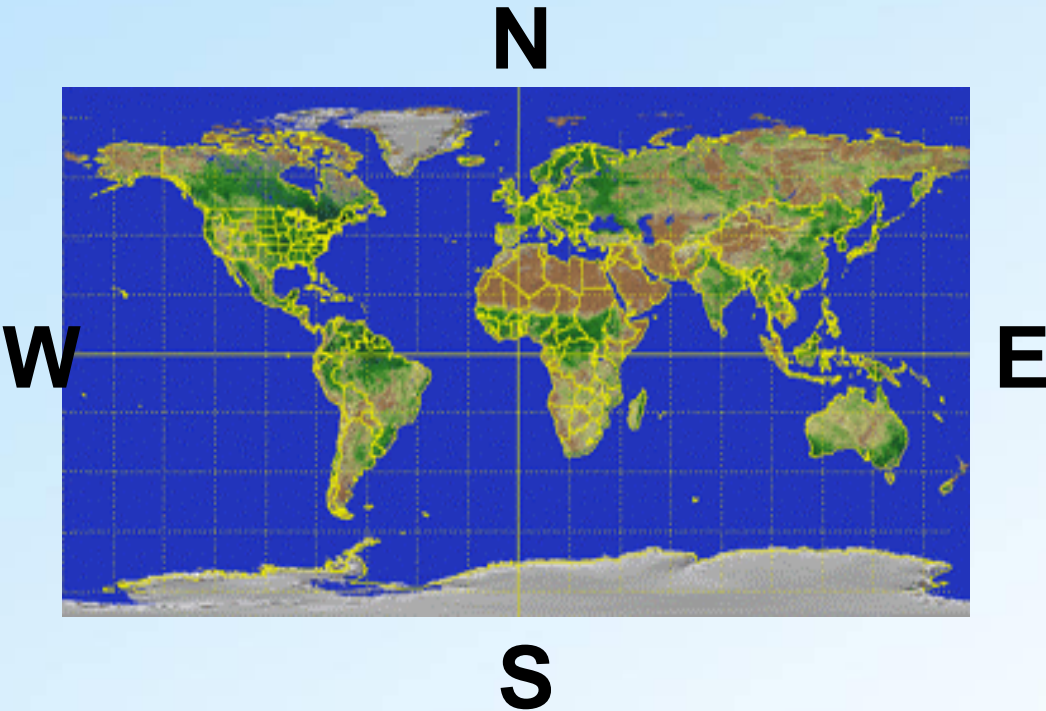
>> East West, North South on The Earth



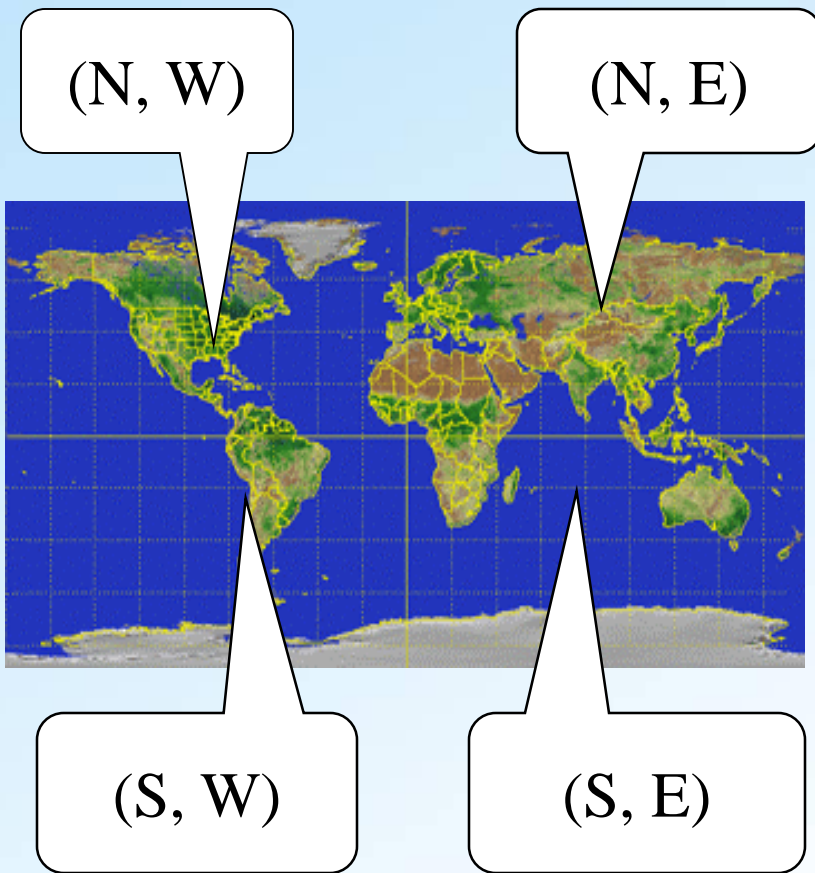
- Let the X axis be the Equator.
- Let the Y axis be the Prime Meridian that runs through Greenwich outside of London.
- Lat/Long are the 2 grid points by which you can locate any point on earth.

>> East West, North South on the Earth

- Let each of the four quarters then be designated by North or South and East or West.

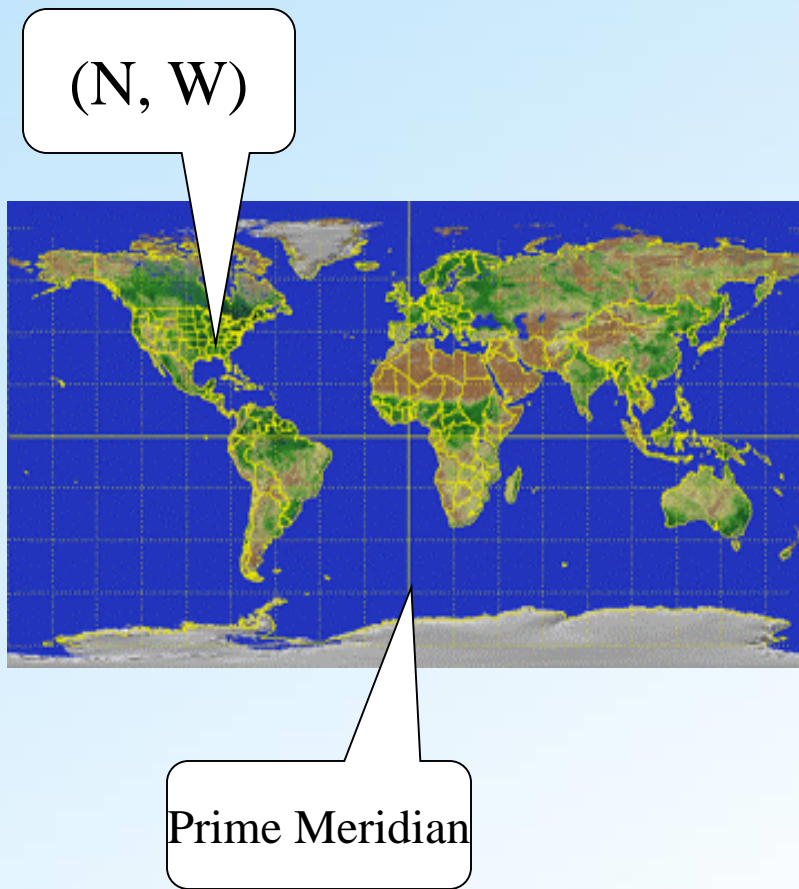


>> East West, North South on the Earth



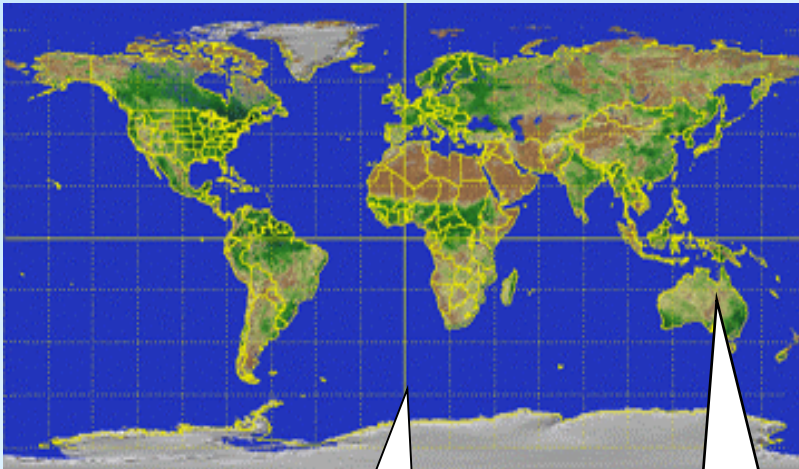
- The N tells us we're north of the Equator. The S tells us we're south of the Equator.
- The E tells us that we're east of the Prime Meridian. The W tells us that we're west of the Prime Meridian.

>> East West, North South on the Earth



- That means all points in North America will have a North latitude and a West longitude because it is North of the Equator and West of the Prime Meridian.

>> East West, North South on the Earth



Prime Meridian

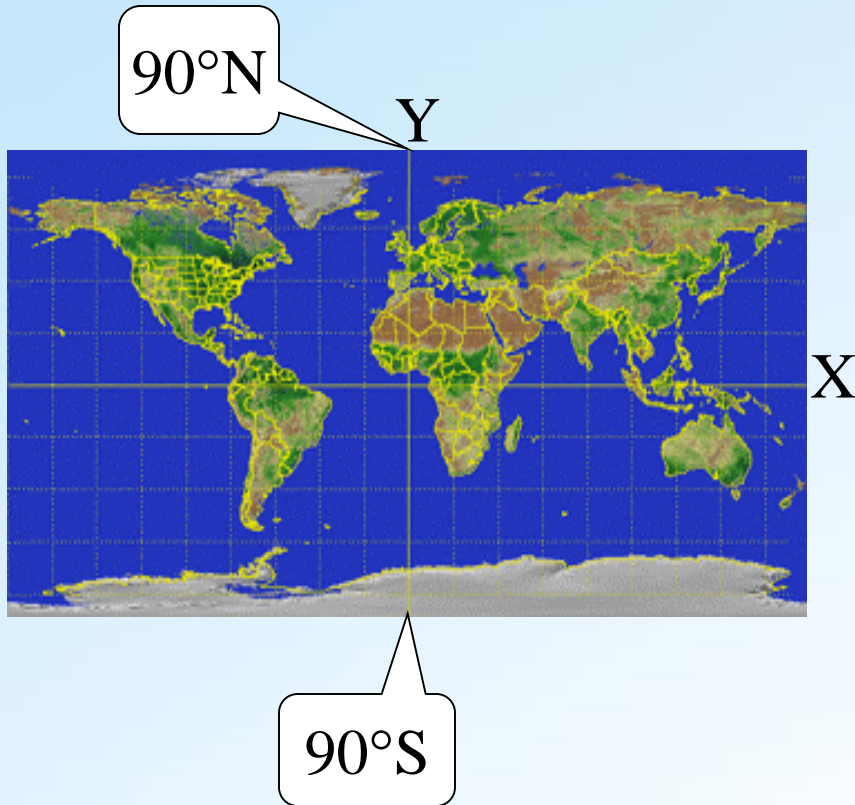
?

- What would be the latitude and longitude directions in Australia?

If you said South and East , you're right!

>> What is Latitude?

- Latitude is the distance from the equator along the Y axis, going N or S



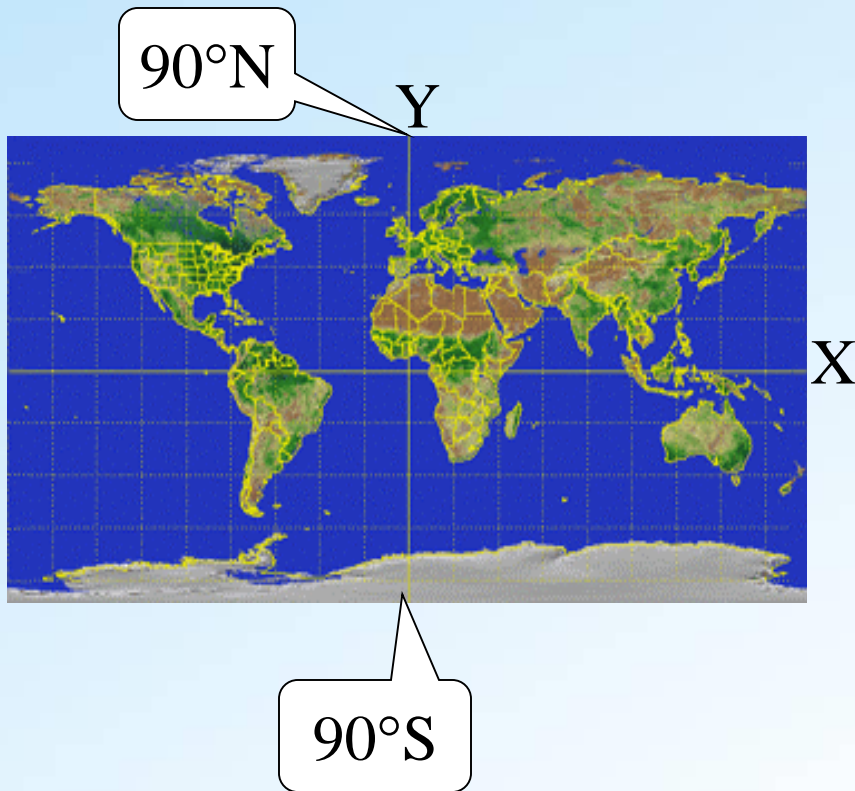
- All points along the equator have a value of 0 degrees latitude.

- North pole = 90°N

- South pole = 90°S

- Values are expressed in terms of degrees.

>> What is Latitude?

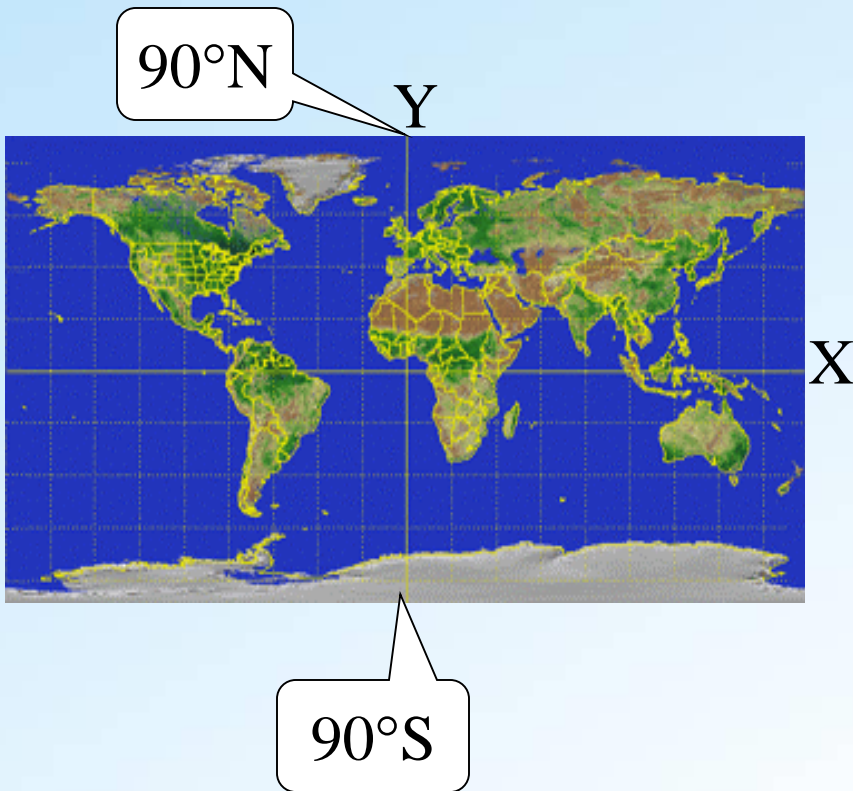


- Each degree of latitude is divided into 60 minutes.
- Each minute is divided into 60 seconds.

This is also true of longitude.

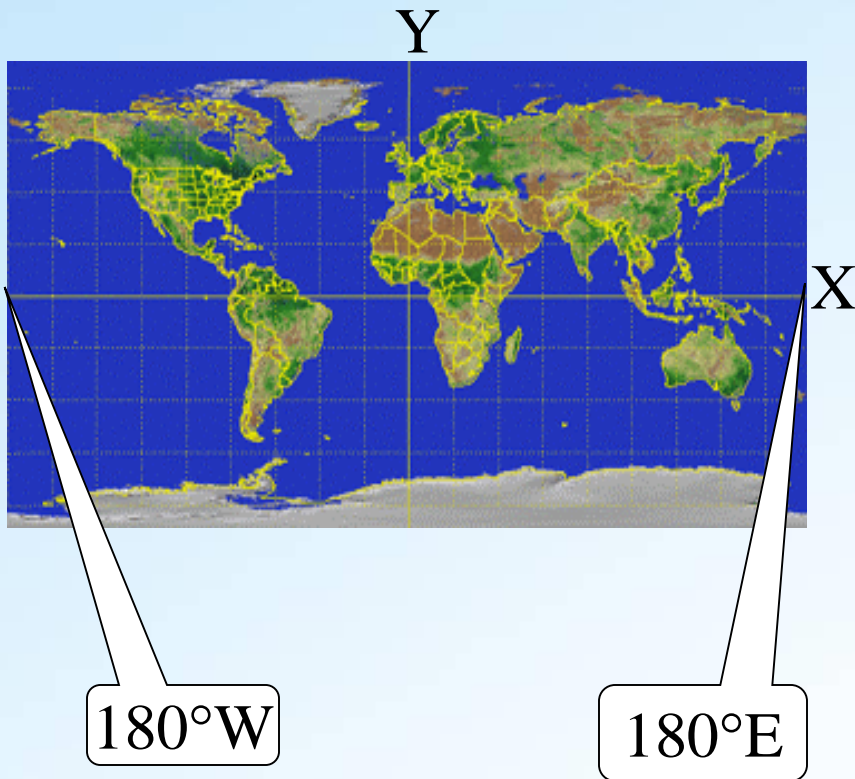
>> What is Latitude?

- For Example:
- $37^{\circ}, 02', 51''\text{N}$



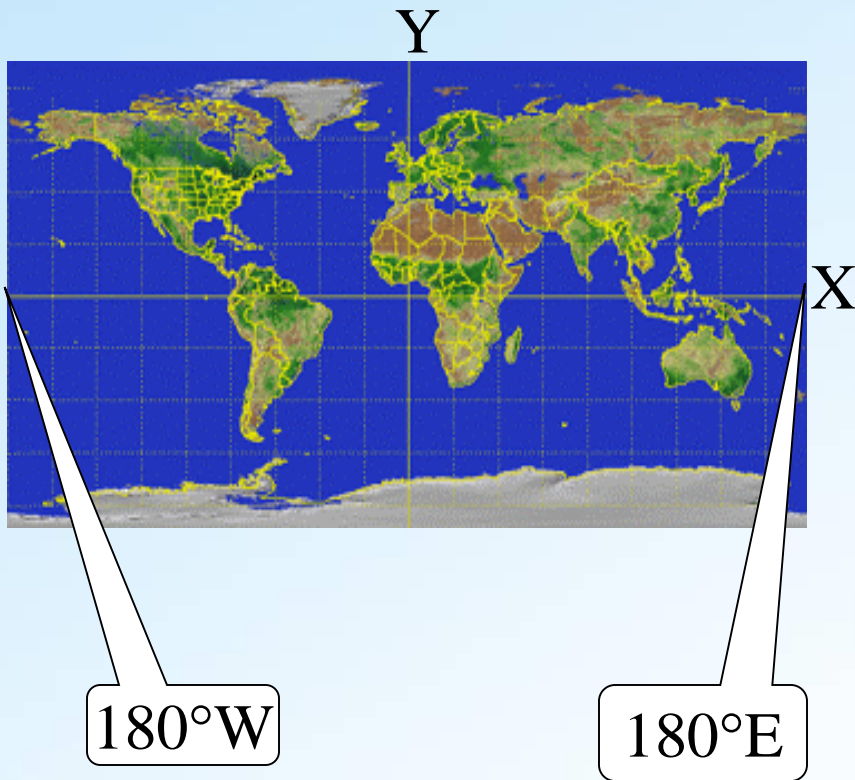
>> What is Longitude?

- Longitude is the distance from the prime meridian along the X axis, going E or W
- All points along the prime meridian have a value of 0 degrees longitude.
- The earth is divided into two parts, or hemispheres, of east and west longitude.

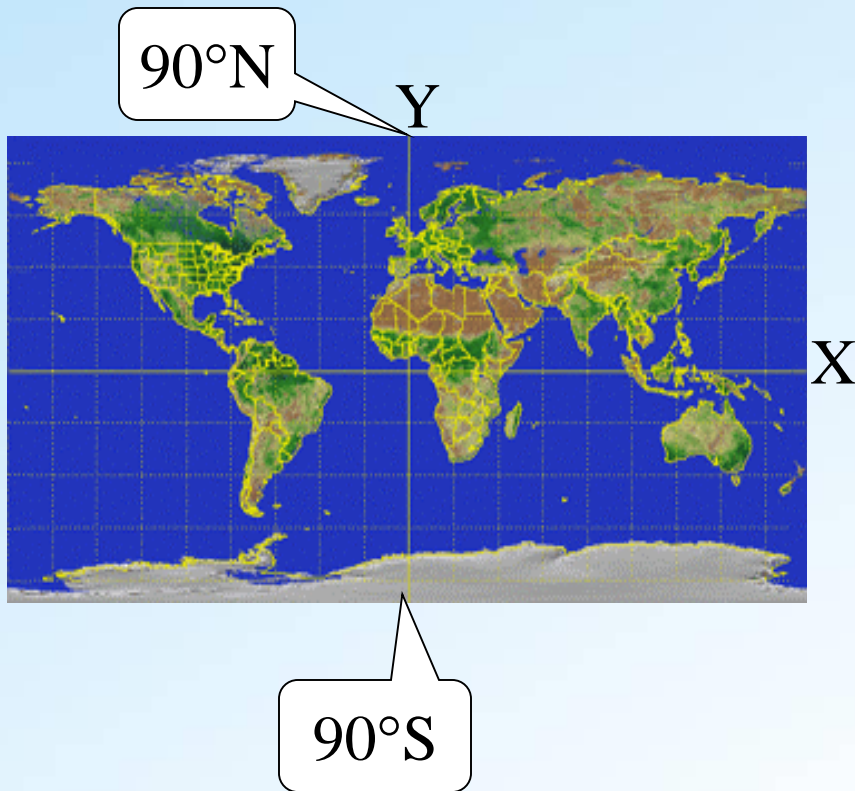


>> What is Longitude?

- The earth is divided into 360 equal slices (meridians)
- 180 west and also 180 east of the prime meridian



>> What is Latitude?



- Our latitude and longitude might be:
- **37°, 03', 13"N**
- **76°, 29', 45"W**

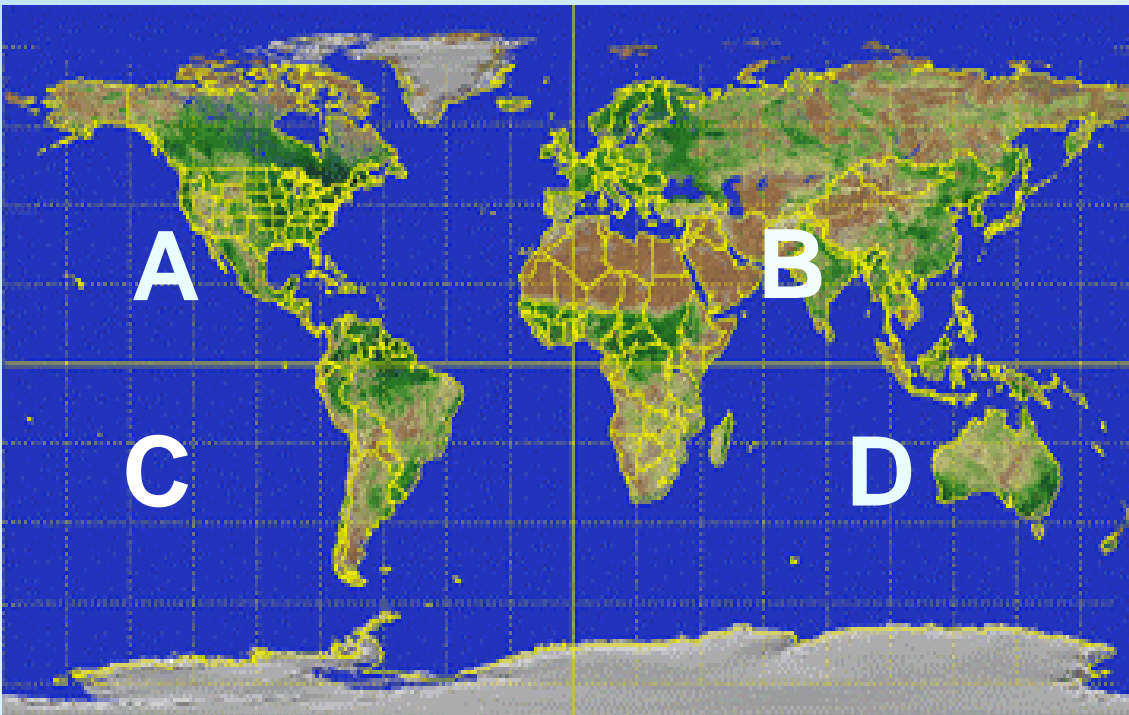
>> So Where is (0,0)?



- The origin point (0,0) is where the equator intersects the prime meridian.
- (0,0) is off the western coast of Africa in the Atlantic Ocean.



See If You Can Tell In Which Quarter These Latitudes and Longitudes are located and label them on your map



- **1. 30°N , 60°E**
- **2. 60°N , 120°W**
- **3. 45°S , 150°W**
- **4. 15°S , 30°W**
- **5. 75°N , 90°E**
- **6. 30°S , 105°E**



Let's See How

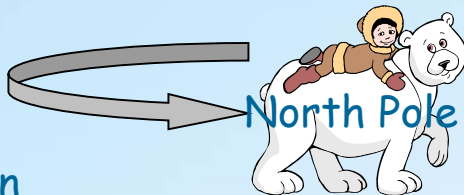
You Did!

- **1. B**
- **2. A**
- **3. C**
- **4. C**
- **5. B**
- **6. D**



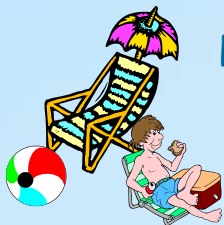
Positioning on the Earth's Surface

East is the direction of rotation of the Earth

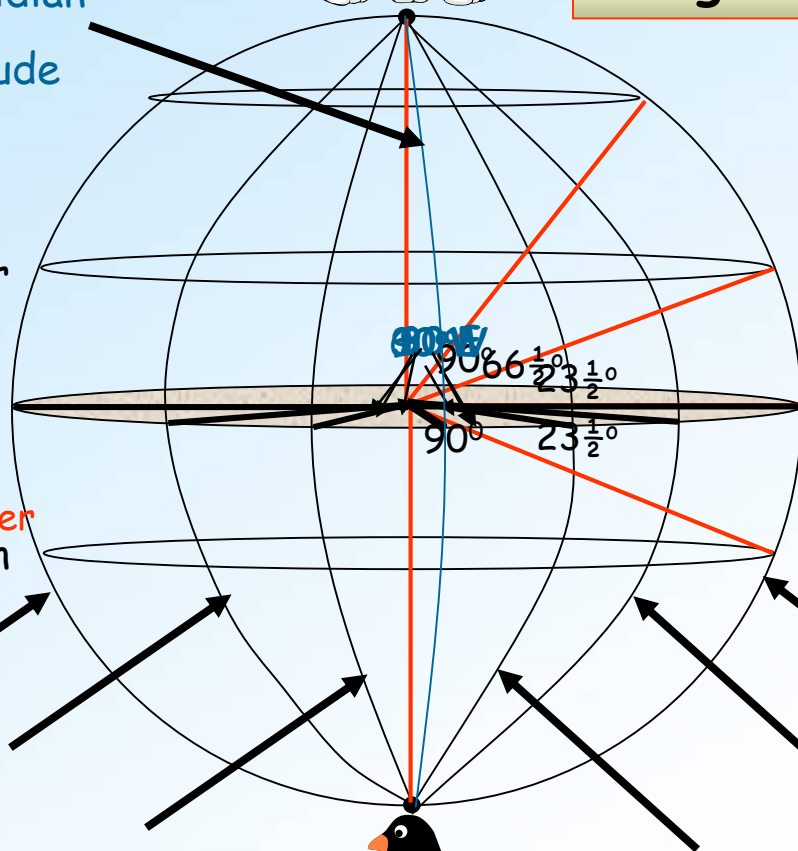


Latitude: (90°N to 90°S)

Longitude: (180°E to 180°W)



Prime Meridian
0° Longitude



Tropic of Cancer
21st June
22nd Sept
20th March
Equator
22nd December
Tropic of Capricorn

Latitude 23 $\frac{1}{2}$ ° North
Latitude 0°
Latitude 23 $\frac{1}{2}$ ° South

Longitude 90° West

Longitude 60° West

Longitude 30° West

Longitude 90° East

Longitude 60° East

Longitude 30° East

South Pole

Latitude and Longitude together enable the fixing of position on the Earth's surface.

>> Notes Page: The Sun, the Tropics and the Poles

The tropics are the two lines where the sun is directly overhead at noon on the two solstices. The sun is directly overhead at noon on the Tropic of Cancer 23.5° N on June 21 and the sun is directly overhead at noon on the Tropic of Capricorn 23.5° S on December 21

The area between the Tropic of Cancer and Tropic of Capricorn is known as the "tropics." This area does not experience seasons because the sun is always high in the sky.



Date	Name	Location where sun is overhead 90°	Length of Day in NYC	Sun's Noon Time angle in NYC
March 21 st	Vernal Equinox	0° Equator	12 Hours	49°
June 21 st	Summer Solstice	23.5° N (Tropic of Cancer)	15 Hours	25°
September 21 st	Autumnal Equinox	0° Equator	12 Hours	49°
December 21 st	Winter Solstice	23.5° S (Tropic of Capricorn)	9 Hours	73°

>> Notes Page Time Zones

Why do we need them? When it is dark and the middle of the night where you are, at some other place it is the early morning, somewhere else it is lunch time. Don't you think it would be pretty confusing to have it called "midnight" in all those places?

- **The Earth is divided into 24 time zones!**

- because the Earth Rotates

- **1 Time zone for every 15° of Longitude**

- **The Earth Spins 360° in 24 hours**

- **$360^{\circ} / 24$ hours**

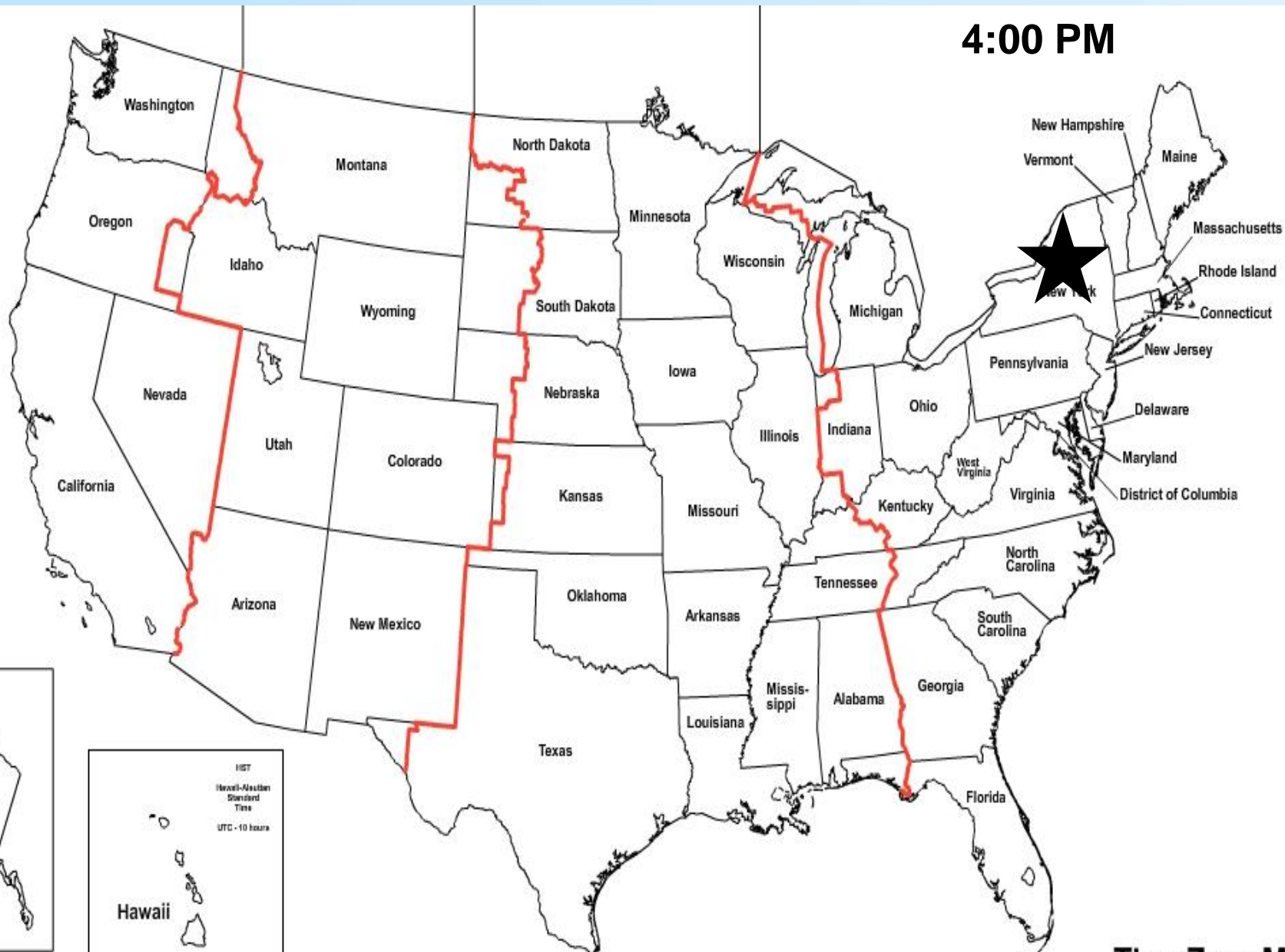
- **We measure from The Prime Meridian in Greenwich England**

Every 15° to the East = +1 Hour

Every 15° to the West = - 1 Hour



4:00 PM



If it is 4:00 PM in New York What time will it be in Iowa, Utah, and Oregon?

TimeZoneMa