

Latitude and Longitude



I Can Statements

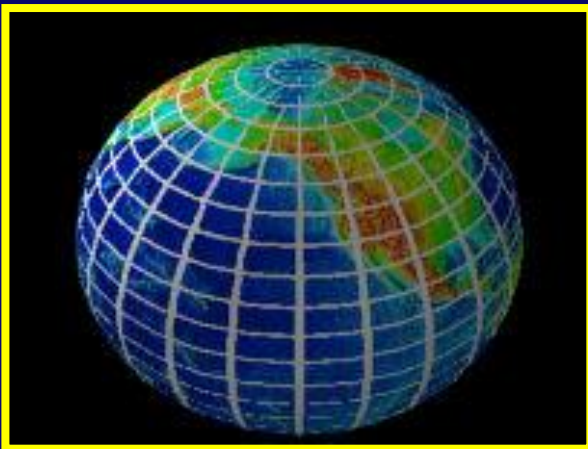
At the end of this lesson, you should be able to say, with confidence:

- I can distinguish between latitude and longitude lines on a map.
- I can explain what the reference lines are for both latitude and longitude.
- I can locate a place on a map, based on its latitude and longitude.

Cartography

The science of mapmaking is called cartography.

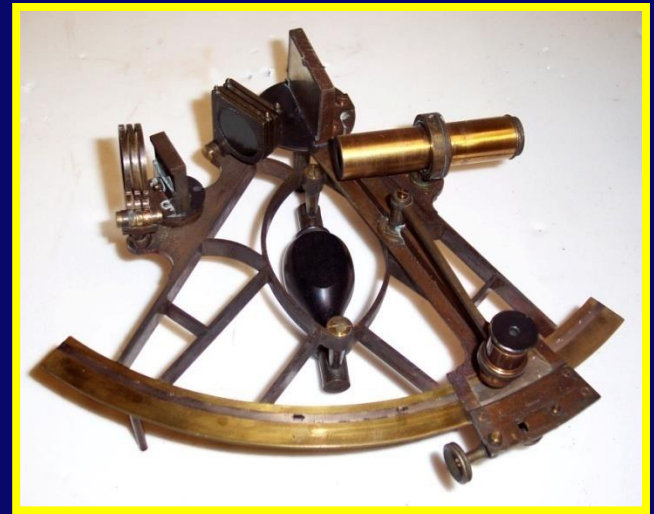
Originally, maps were drawn by hand, using compasses, protractors, and rulers.



Cartographers use an imaginary grid of horizontal and vertical lines to locate points on Earth exactly.

Navigating the Seas

The system set up by the long ago cartographers, was helpful to ships at sea that could see no landmarks, but could use the north star to gauge their latitude.



Sextant

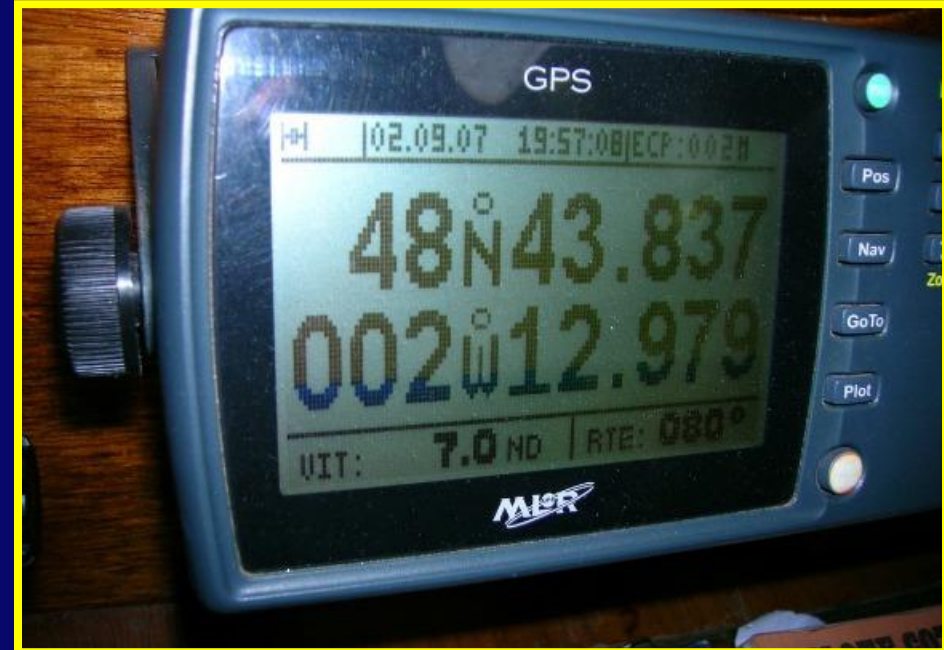
Navigating the Seas

The latitude and longitude system is still used today by modern day ships with the help of computers, GPS, and satellites.



GPS

The cartographer's system is also used on land, with the Global Positioning System, known as GPS.



The GPS works with satellites which collect beacon signals, analyze the signals, and send back data.

Equator

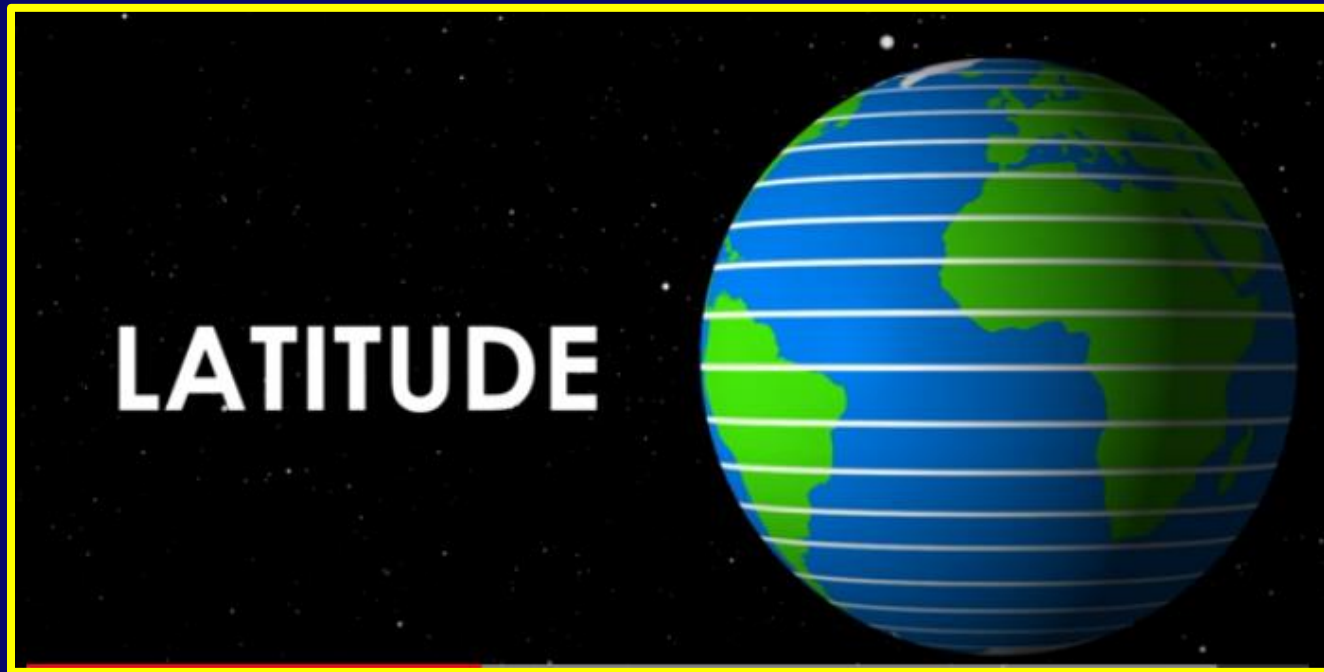
The imaginary horizontal line that circles Earth, halfway between the poles, is called the equator.



The equator separates the Earth into two equal halves, called the northern and southern hemispheres.

Latitude

Lines running parallel to the equator are called lines of latitude.



Latitude, itself, refers to the distance in degrees north or south of the equator.

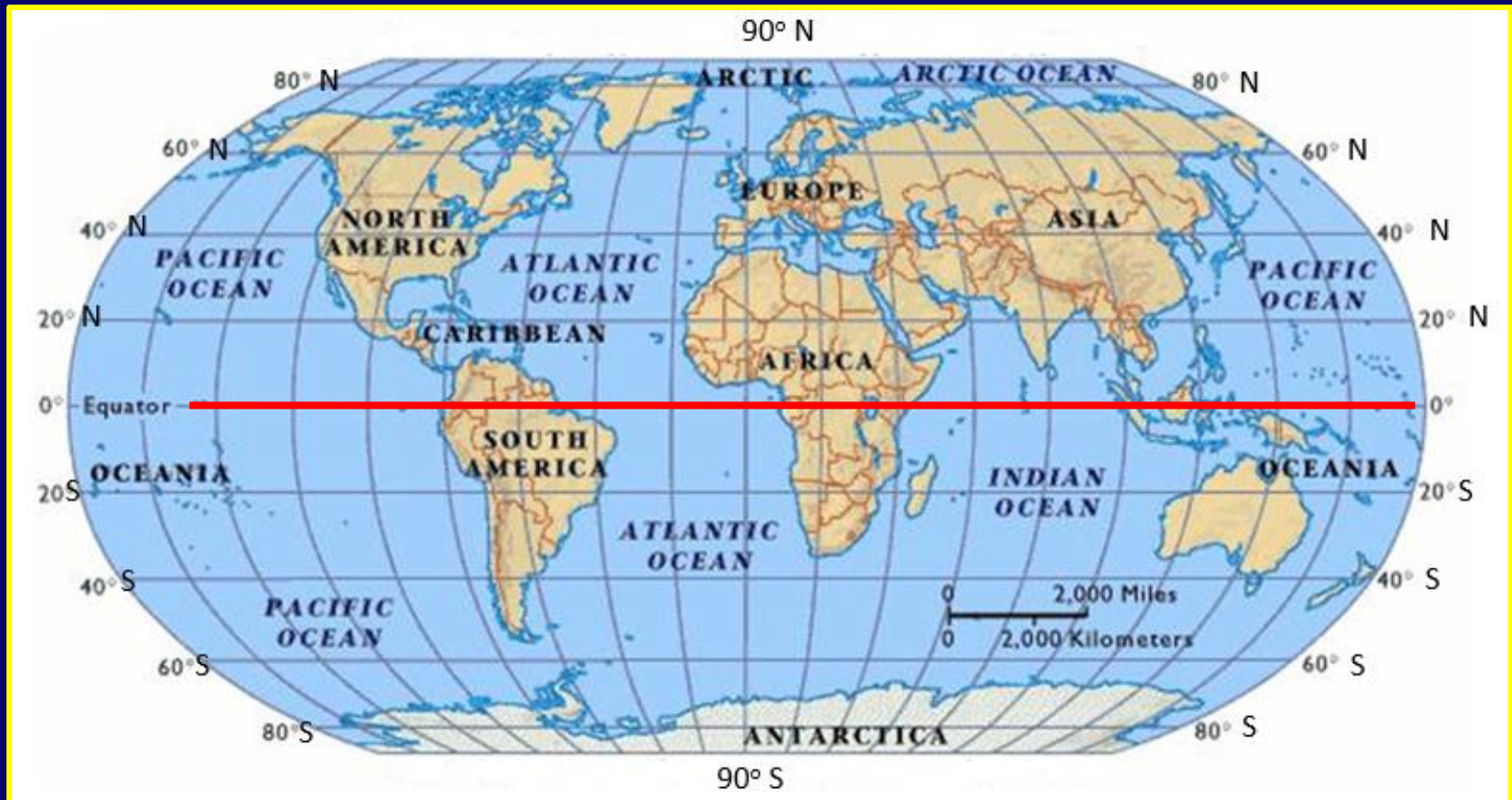
Degrees of Latitude

Latitude is measured in degrees and each degree of latitude is 69 miles or 111 kilometers.



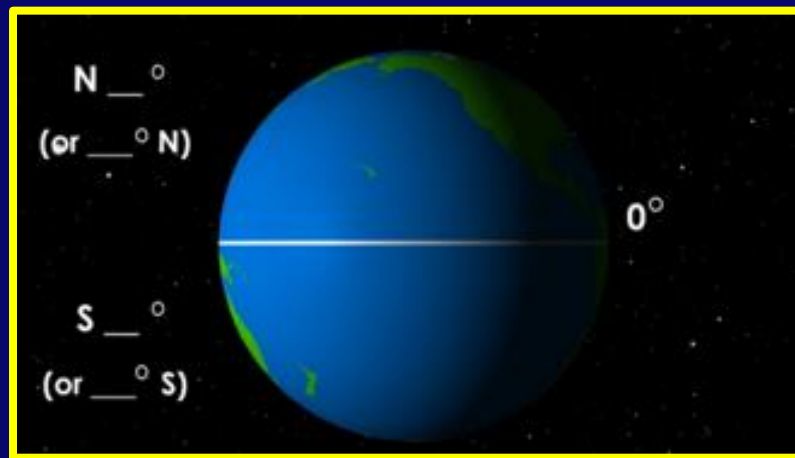
Equator and Poles

The equator is at 0° latitude and the poles are at 90° north and 90° south latitudes.



North (N) or South (S)

All locations north of the equator are referred to as degrees north latitude and are represented by $^{\circ}$ N.



All locations south of the equator are referred to as degrees south latitude and are represented by $^{\circ}$ S.

Minutes

Each degree of latitude can be further be broken down into 60 smaller units, called minutes, and denoted with a ' mark.



48⁰ 43' 837''

Seconds

Each minute of latitude can also be broken down into 60 smaller units, called seconds, and denoted with a " mark.



48⁰ 43' 837''

Longitude

Lines that run perpendicular to the equator are called lines of longitude.



Longitude lines are also called meridians.

Semi-Circles

Lines of longitude are not parallel to each other.



Longitude lines converge at the poles.

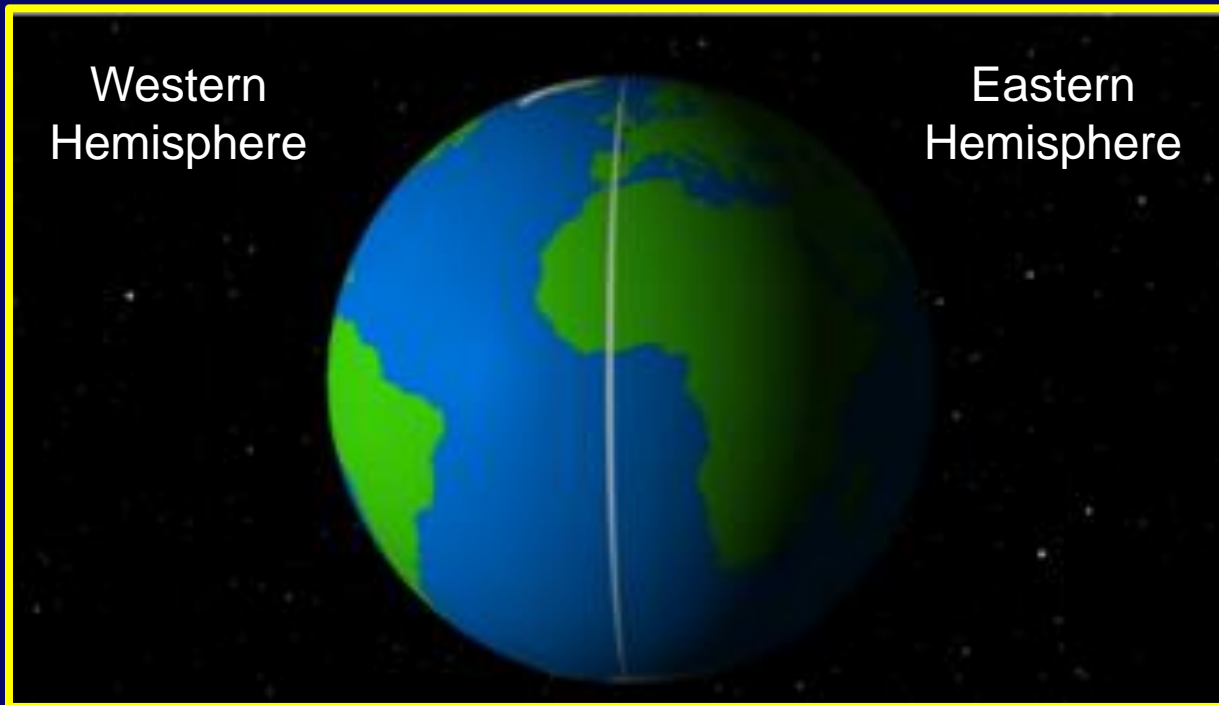
Longitude lines are much wider at the equator.



Longitude lines are actually semicircles.

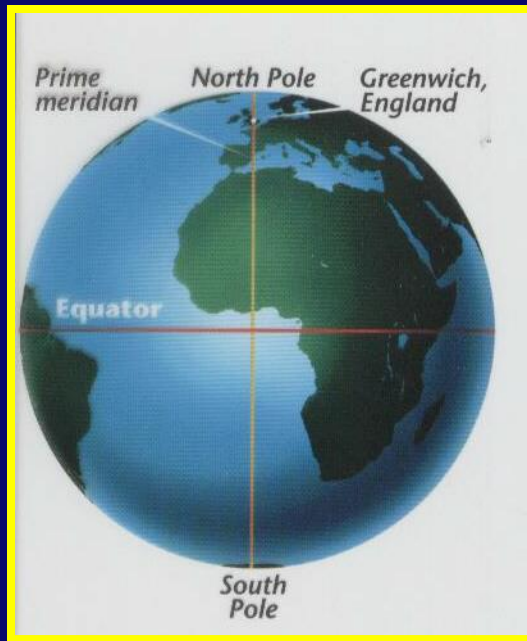
East and West Hemispheres

The imaginary line that divides the Earth into the East and West Hemisphere is called the prime meridian.



Prime Meridian

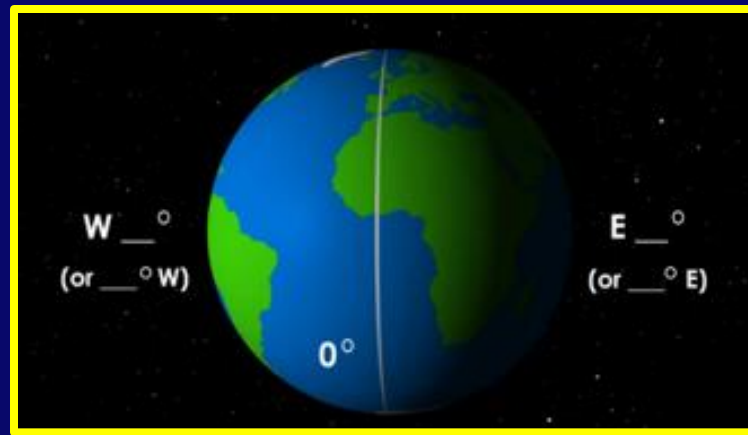
The prime meridian represents 0° longitude and runs through Greenwich, England, home of the Royal Navy Observatory.



England's navy were the people who created this system, so they got to choose the prime meridian.

East (E) or West (W)

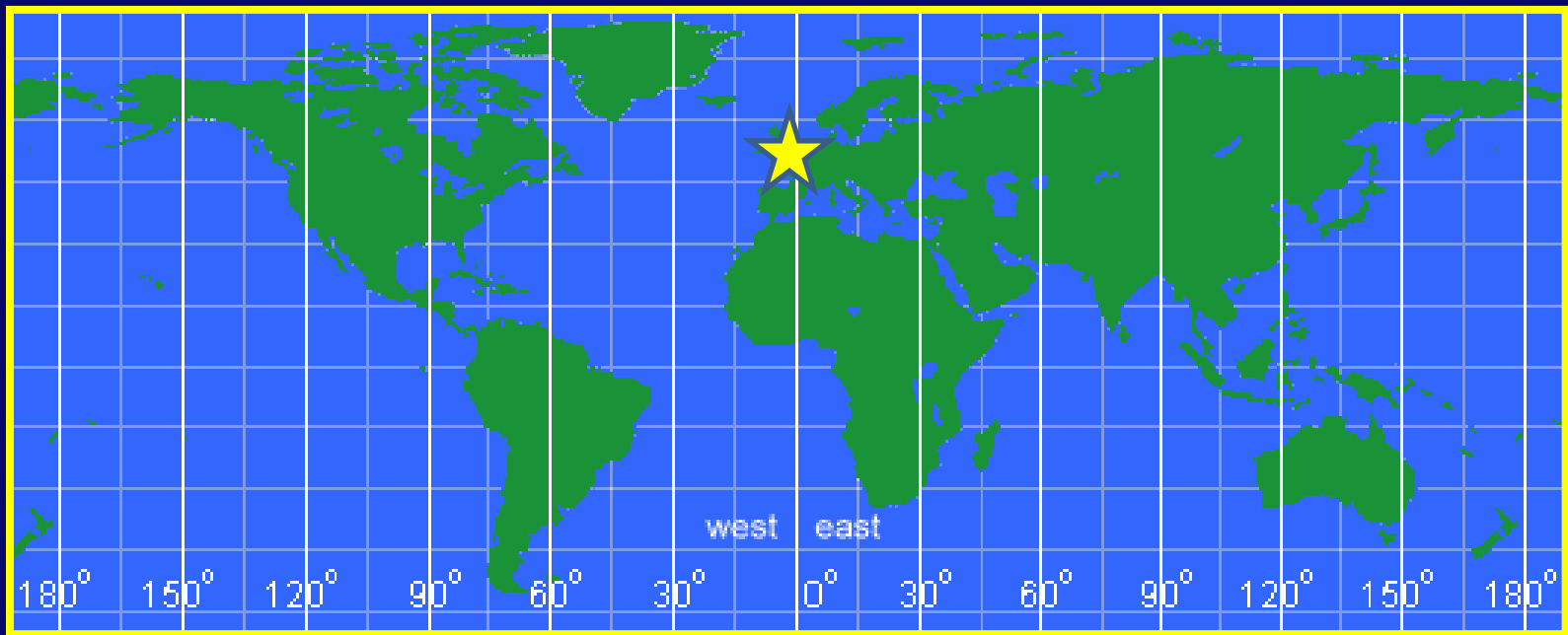
All locations east of the prime meridian are referred to as degrees east longitude and are represented by $^{\circ}$ E.



All locations west of the prime meridian are referred to as degrees west longitude and are represented by $^{\circ}$ W.

East (E) or West (W)

Points to the left of the prime meridian are numbered from 0° to 180° west longitude; points to the right are numbered 0° to 180° east longitude.



Greenwich England

International Dateline

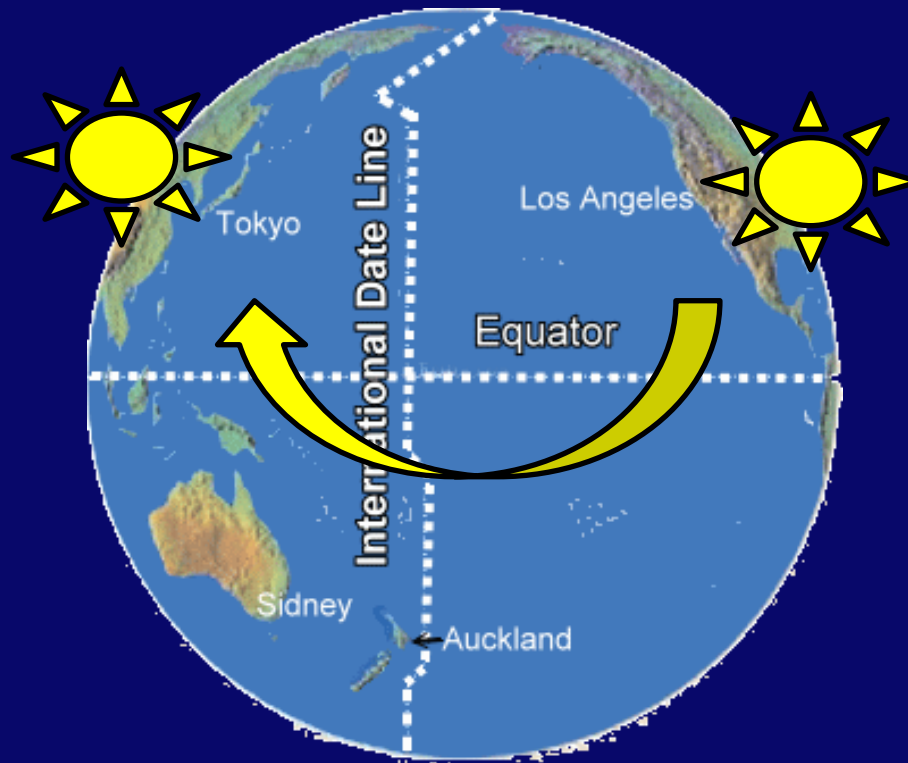
180° longitude corresponds with the International Dateline, which sits mostly on the 180° longitude line.



The international Date Line moves around islands and continents, so as not to divide time within a country.

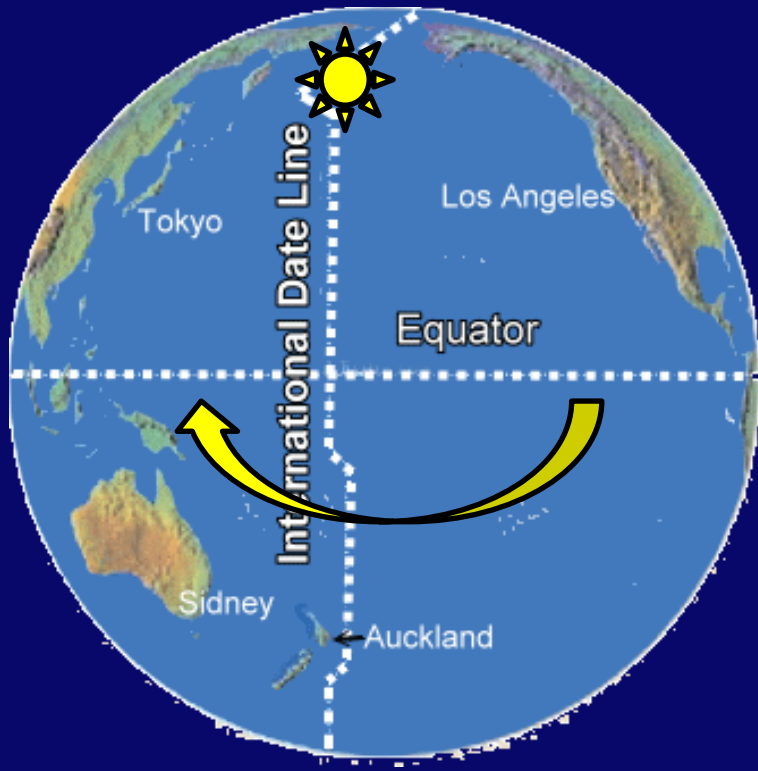
International Dateline

Because the Earth rotates counter-clockwise, the Sun rises in the east and sets in the west.



International Dateline

The International Date Line marks the very beginning of each new day on Earth.



People crossing the line towards the West skip forward a day.

Those crossing the line towards East repeat the day, numerically.

Personal Note

On my 10th birthday, my family and I flew from Sydney, Australia to Detroit, Michigan. We left Sydney, in the afternoon of October 28th. We arrived in Detroit, in the late afternoon of October 28th.
(It was a 24 hour flight, plus layovers)



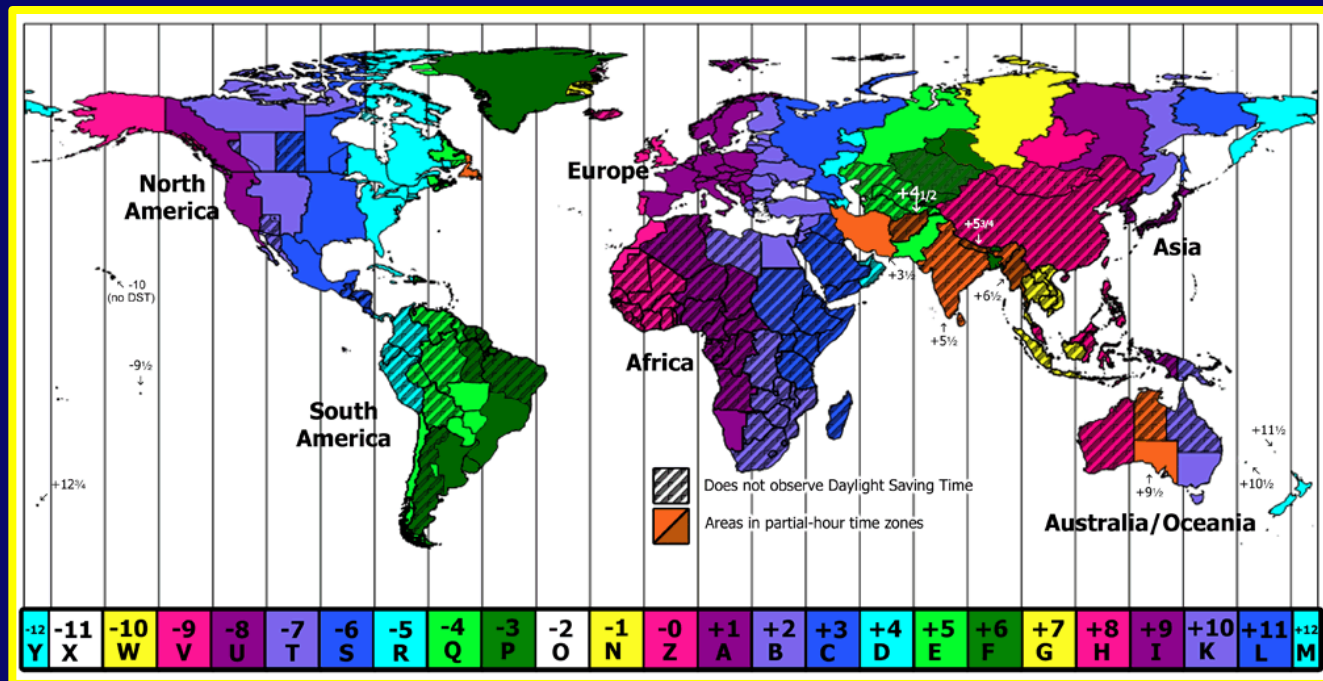
Those crossing the line towards the East repeat the day, numerically.



2nd Grade Class Photo (7 years old) taken in Australia

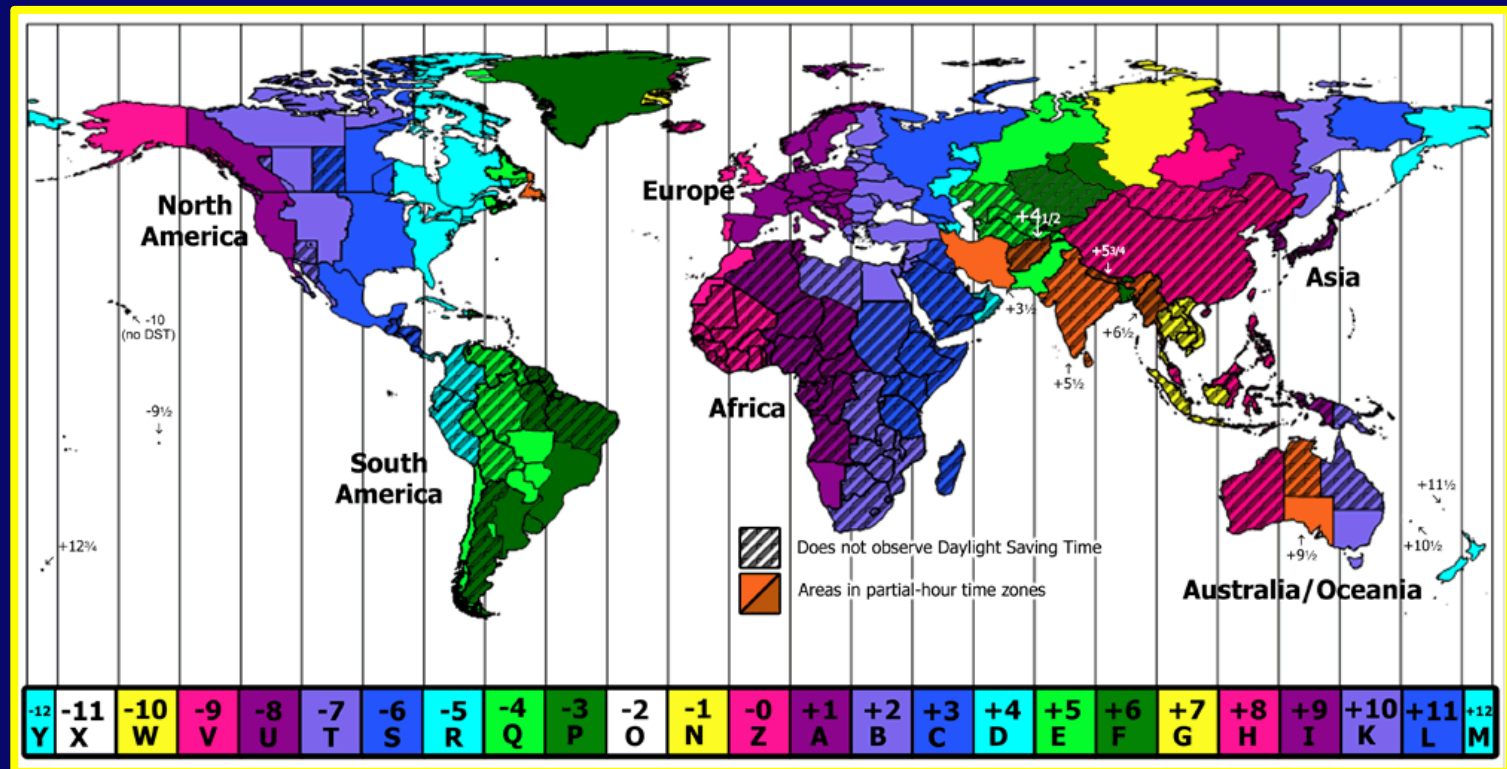
Time Zones

Times zones were determined by dividing the Earth into 24 equal parts with each time zone equaling 15° longitude and one hour difference.



Time Zones

As you travel west, the time gets earlier and as you travel east, the time becomes later.



United States Time Zones

The United States has 6 different time zones.



The End

