Global Awareness I – Geography

Map Skills

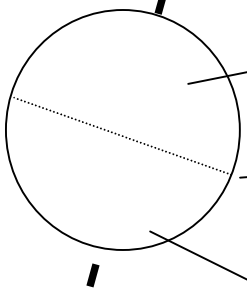
Geography: comes from the Greek word *Geographia* which translates to "description of the earth. People that study geography are called geographers. It's the study of the earth and how people and places influence each other.

I. Maps and Globes – in studying the earth geographers have two tools which represent the earth, maps and globes.

Globes: Since our planet is globe-shaped, this is the most accurate representation of Earth.

The earth is sooo big, however, that we have divided the earth and globes to make it easier on ourselves. We call these divisions **hemispheres** or half of a sphere.

Notice that the earth is tilted rotating on its axis which causes our night and day!



North pole

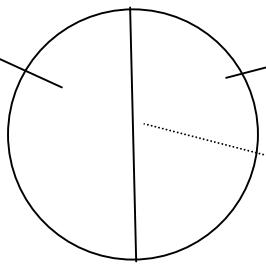
Northern hemisphere

Equator: imaginary line that divides the earth into the northern and southern hemispheres. This is found in the center of a world map at **0** degrees latitude.

Southern hemisphere

South pole

Western Hemisphere



Eastern Hemisphere

Prime meridian: imaginary line that divides the earth into eastern and western hemispheres at **0** degrees longitude.

The prime meridian runs through the countries of England, France and Spain in Europe and also the west African countries of Algeria and Mali.

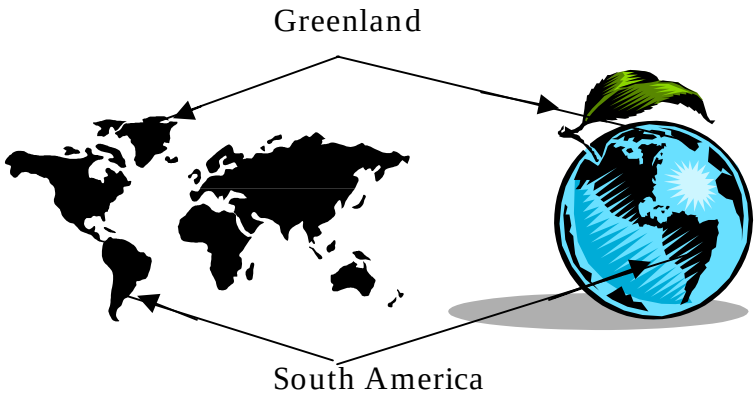
Although globes are the most accurate representations of the earth we really hardly ever use them. They aren't very easy to carry around so instead we use maps. But maps have problems as we shall see. Making maps used to be a great art, but today people make most of our maps with the aid of a computer.

Cartography: map making. People who make maps are **cartographers**.

Maps: flat representations of the earth. Maps are cool looking but there's one big, big problem with them.

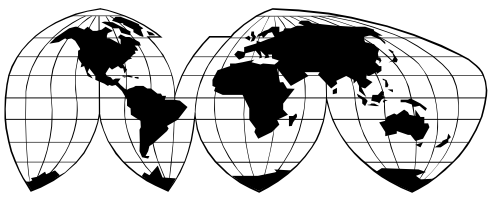
The problem is easy to spot. Just look at Greenland on the map and globe below. Now compare the size of Greenland to the size of South America in each. Hmmmm. What you are looking at is a flaw in all maps.

Its called **map distortion** – all flat maps are inaccurate because you can't make something round flat. Imagine the earth is like an egg. Well the earth is that egg and when we flatten the egg or the earth it cracks up and gets distorted. Even a road map of Pennsylvania is going to have some distortion because a flat map smashes and flattens the hills, valleys and terrain of our state.



World maps are heavily distorted because the bigger the area mapped the greater the distortion. Because of this cartographers have different ways of drawing maps which make the continents slightly different sizes and shapes. These different ways of drawing maps are called **map projections**.

Some common map projections hanging up in my room are the *Mercator*, *Mollweide*, *Interrupted*, and *Robinson* projections, but remember there are many more. They all deal with distortion in a slightly different way. The above map I believe is a Mollwiede map and this, as you can tell quite easily, is an Interrupted map.



II. Using Maps: All maps are distorted but we use them anyway. I get funny looks when I carry around my globe at the airport. Well when we use any map there are certain things that all good maps have! Let's look at what those things are.

T. – Title – shows what the map is trying to tell you.

O. – Orientation – shows direction on a map.

D. – Date – when the map was made.

A. – Author – shows who made the map.

L. – Legend – (Key) tells us what the symbols mean on a map.

S. - Scale – snakes have them. Show how to calculate distance.

I. – Index – alphabetized list of map locations to find on the grid.

G. – Grid – tool to locate items on the map.

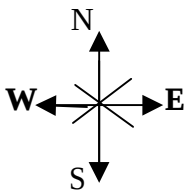
These are the things every map must have. To remember them, someone far more brilliant than I made them into a funny acronym **TODALSIG**. This is just a memory trick so you can remember them later.☺

Let's take about some of these items in more detail.

Orientation: usually comes in the form of a direction pointer or compass rose.

- *If the map doesn't tell you, always assume the direction north is towards the top of the map. Most maps will indicate north with a compass rose.*

Compass Rose: symbol which shows all the directions on a map.



Cardinal directions: N,S,E,W

Intermediate directions: NW,NE,SE,SW

Sometimes the map doesn't give you a full blown compass rose. Sometimes it just gives you a direction pointer which shows you north. How do you remember the other directions. Well either remember **N**ever **E**at Soggy **W**heat or remember **WE**, and you probably won't get the directions east and west backwards ever again.

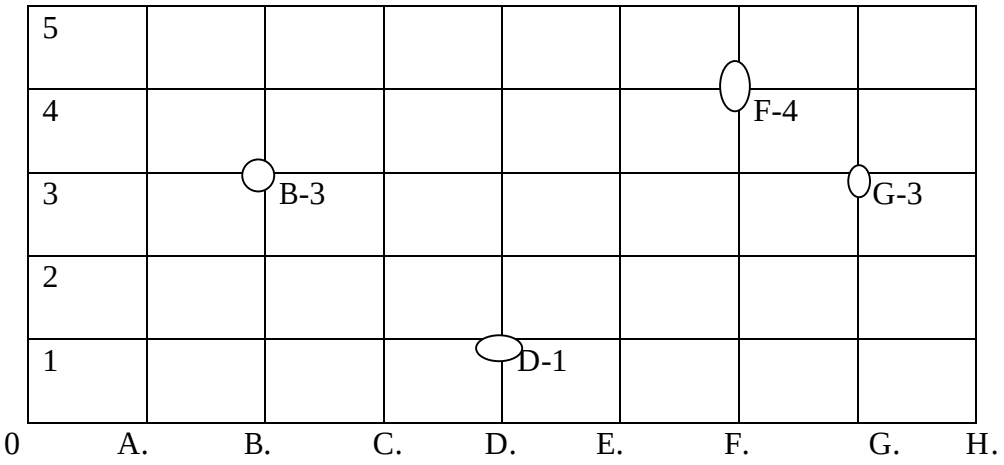
However, if you're lost in the woods and you don't have a map, what do you do? Well hopefully you have a compass.

Compass: device whose needle always points to **magnetic north**. Compasses don't point to the actual north pole, but to a point several hundred miles south of that. Why do compass's work? Not witchcraft, it's just that the earth is a giant, although weak, magnet.

If you don't have a compass **DO NOT try to figure out north by looking at the moss on trees**. Whoever came up with that probably ate lost travelers. Moss grows wherever its cool, dark and moist so check your armpits. The only rule of thumb to use to find direction is either locating the North Star or simply remembering.

"The sun rises in the east and sets in the west."

Grids: horizontal and vertical lines that criss-cross a map to help us find locations. Usually uses a system of numbers and letters. Check out the example below.

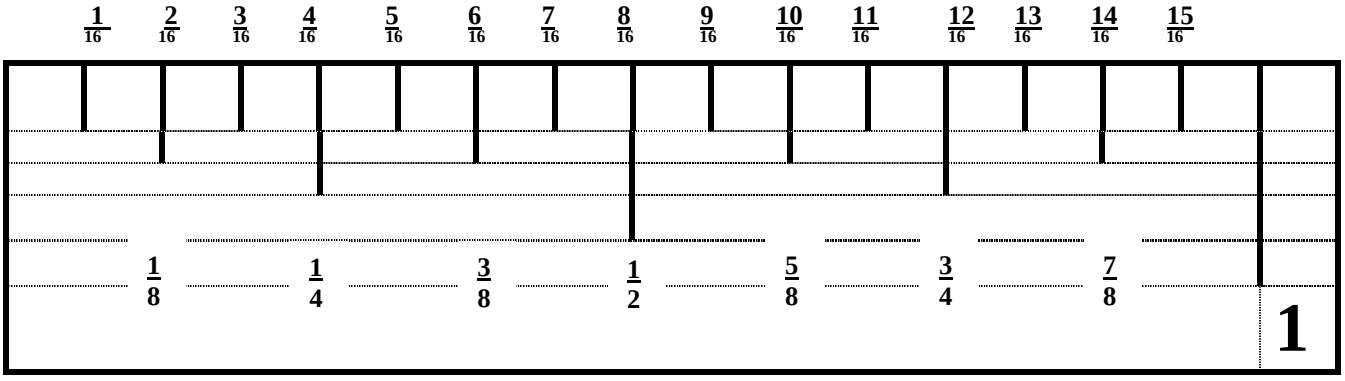


Scale: allows you to figure out distances on a map.

Depending on the size of the map it usually is measured in some form of distance per inch. For instance, on a state map, it might be 17 miles per inch. On a town map maybe 500 feet per inch. Whatever it is bone up on your math and multiplying skills baby because you are going to need them.

- I like to figure out the scale to the nearest sixteenth of an inch because it's accurate and it helps to teach you how to use a ruler. If you don't

remember how to use a ruler or that it's broken into sixteenths, then look below.



Now check out this example using the scale of 1" equal to 19 miles.

Example:

Step one: *Measure the line*

The line above measures 6 and 2/16^{ths}, or if we reduce the fraction 6 and 1/8.

Step two: ***Change the measurement to an improper fraction.***

Turning 6 and 1/8 into an improper fraction, we would multiply the six times the eight giving us 48. Then we would add the one giving us 49 all over 8.

49/8$^{ths.}$

Step three: ***Multiply the improper fraction times 19.***

Remember to turn 19 into a fraction simply put it over one.

$$\frac{49}{8} \times \frac{19}{1} = \frac{931}{8} = 116\ \frac{3}{8}\ \text{miles}$$

Extra credit:

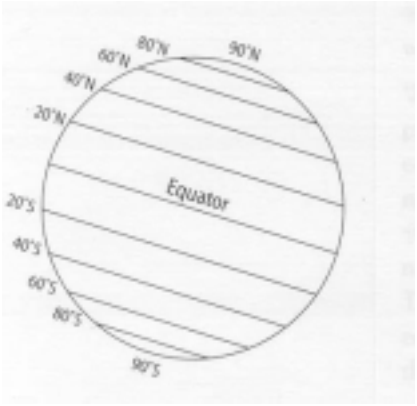
What is the distance if the line measures 8 and 1/3?
How about if the scale were 27 miles and the line was 7 and 3/16? What's the distance?

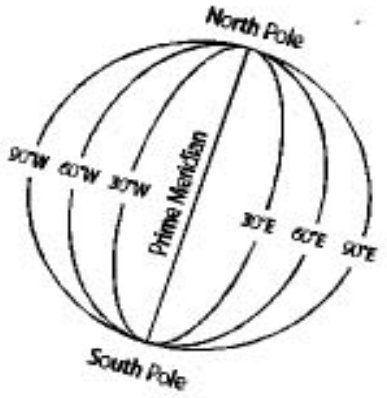
III. The Global Grid System: Latitude and Longitude.

In class we worked with road maps of different countries and of Pennsylvania to hone our skills with TODALSIG. However the grid systems we use on those maps are the simple system of letters and numbers. Unfortunately our big, round earth needs a grid system that is a little more complicated and confusing than this. But don't worry you'll get the hang of it in no time at all.

Global Grid: grid system we use for the earth made up of latitude and longitude.

> **Latitude**: (parallels) horizontal lines that measure degrees N & S of the equator. Also known as Fatitude.
>
> **Longitude**: (meridians) vertical lines that measure degrees E & W of the prime meridian. Also known as Tallitude.





When we use latitude and longitude it is important to remember that latitude is always **first**. So for instance:

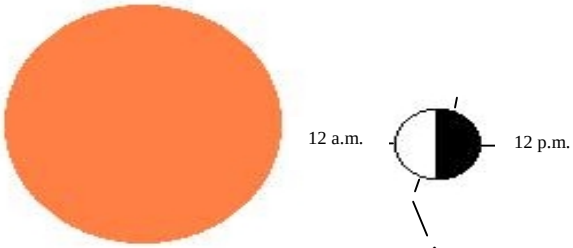
Titusville, PA 41 N, 79 W

If you wrote it with the longitude coordinate 79 W first it would be incorrect. So be careful and always have whether its north or south **first**.

- We use degrees to measure latitude and longitude. However degrees can be broken down further into 60 minutes, and each minute is broken down into 60 seconds. With these measurements we can get incredibly detailed

coordinates. G.P.S. systems (Global Positioning Systems) use these to guide cars and aircraft accurately to their destinations.

IV. Time Zones: Can't live with them, can't be on time without them.



The Sun

The concept of time zones is not too terribly difficult to understand. Since the earth rotates on its axis causing night and day, then the sun can't be up everywhere at once. Thus obviously when it's noon in Titusville it can't be noon on the opposite side of the world. Rather there it would be 12 o'clock midnight. It's really only when you travel great distances rapidly by way of air travel that you notice time zones. However if you have a friend in California it's a good thing to know that they are three hours behind us, so if you call at nine in the morning, that is six a.m. in California. I don't know about you but I'm asleep at that time and probably so will your friend.

Here's how time zones work. Since the earth takes 24 hours to rotate on its axis we have 24 time zones, each an hour time difference from the previous one. Since the sun rises in the east and sets in the west, then the sun rises earlier over Titusville, PA then it would over California. How much earlier? Well as you move westward, for each time zone line that you cross you subtract one hour. If you look on the map and count you'll see that you cross three time zone lines getting to California, thus they are three hours behind us.

What about the time as you go to Great Britain. Well from Titusville move eastward. Each time you cross a time zone line you now add an hour. If you look at the map above you'll see that you have to count five time zone lines. Thus Great Britain is 5 hours ahead of us. Remember that if you calling your Aunt Shirley whose visiting there. Don't call her at nine p.m. our time and expect her to be happy.

International Date Line: when you cross it you add or lose a day.

Finally there is the anomaly that is the International Date Line. Since a day officially begins at 12:00 midnight, then that means that in different parts of the world it can be a different day then where you are at. Where this happens is the International Date Line which we put in the middle of the Pacific Ocean. Depending on how you cross it you gain or lose a day. It's kind of like time travel but not really. Imagine using it to celebrate your birthday once in Japan and then flying back the United States and celebrating it again. Weird stuff man.