Physical Geography
Chapter 2

Earth is spherical
-Oblate spheroid, flattened at the poles
-Earth's deviation from a perfect sphere is minor.

A globe is an almost perfect representation of our earth.
Great Circle-plane which passes through the center of earth
1. Divides the earth into hemispheres (equator)
2. Every Great Circle is a circumference
3. Mark the shortest travel route between locations on the Earth's surface

Small Circles-do not pass through the center of the Earth.
Examples:

The Arc of a Great Circle is the shortest distance between two points.

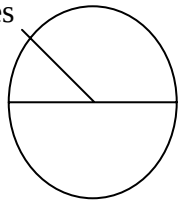
Circle of Illumination-divides Earth into light and dark halves (day and night)

<u>Coordinate Systems</u>
-Divide up maps (globes into grid cells)

Latitude/Longitude
North Pole/South Pole
-Line between them –equator (divides the Earth into halves)

Latitude-angular distance
-Parallels

Los Angeles



Circumference = 40,000km/360 =11
25,000mi/360 =6
Thus divided into minutes/seconds
Minute=1.85 km (1.25 miles)
Seconds=31 m (102 feet)

Sextant: measures angle between horizon
And celestial body (like the north star).

Longitude-measured from Greenwich, England (1884)
>Great Circle Lines are meridians
>At the Equator: 1 degree=111 km (69 miles)
>At 60°N: 1 degree=56 km (35 miles)
Longitude is related to time. The Earth rotates 15 degrees longitude per hour (24 time zones)
>Overhead noon sun (Solar Noon): shortest shadow

1884 – Divided 24 time zones – for each hour

- Because Railroads and telegraph
- Ideally each zone represents 15° longitude
  360/ 24 hours = 15°
  - Set it up with the Prime Meridian at center
    7 ½ - Greenwich - 7 ½
- Variations exist: so boundaries do not run through the middle of a city
  (US – state boundaries)

GMT- Greenwich Mean Time

- Slow Time- West (they are behind)
- Fast Time – East (they are ahead)

Navigation – chronometer (accurate clock)

Used to be 〉 Chronometer and a
Sextant

IDL (International Date Line)- 180° meridian

- Beginning of time
- Not official until 1880's

Magellan- Noticed one day was missing when sailing on his voyage around the world.

- Experienced one less sunrise/ sunset

Coordinate Systems

1) Point – Latitude/Longitude
>Utilizes Parallels and meridians

2) Area – Township/ Range (US Public Lands Survey System)
>Principal Meridians (Longitude)
>Base lines (Latitude): surveyed on parallels of latitude

Both were surveyed in: as a way of parceling out land in PA.
(Thought to have been suggested by Thomas Jefferson.)

Townships: Square Plot 6 miles on a grid divided into 36 sections, which are subdivided into Quadrants

Figure 2.11

GPS – Global Positing System
Uses a network 11,000 miles above Earth
Utilizes Radio Signals

Maps and Map Projections

Map is a million words
>representation of Earth or parts on flat 2 dimensional paper.

Advantages of Maps:
1) Maps show spatial stuff very efficiently
2) Can be used to show distances
3) Plot routes
4) **Many Others:**

Limitations of Maps:
1) Distortion
2) No Map can show everything

Global Grids Have Four Important Geometric Properties:
1) Parallels of latitude are always parallel
2) Parallels are evenly spaced
3) Meridians of longitude converge at the poles
4) Meridians and Parallels always cross at right angles

Properties of Map Projections
1. Shape
>Conformal Maps: maintain true shape of features

2. Area
>Equal area as they have in reality (Equal Area Maps)
>Topographic Ratio Scale
>Mercator Projection: common on many maps (shows Greenland as large as South America)

3. Distance: Just as no flat map can show true shape for all of Earth or for large areas, neither can it maintain a constant scale of distance over all Earth's surface.
>Small areas, distance distortions are small

4. Direction: Because the compass directions on Earth curve around the sphere, not all flat maps can show true compass directions.
>Azimuthal: maps that show true directions as straight lines