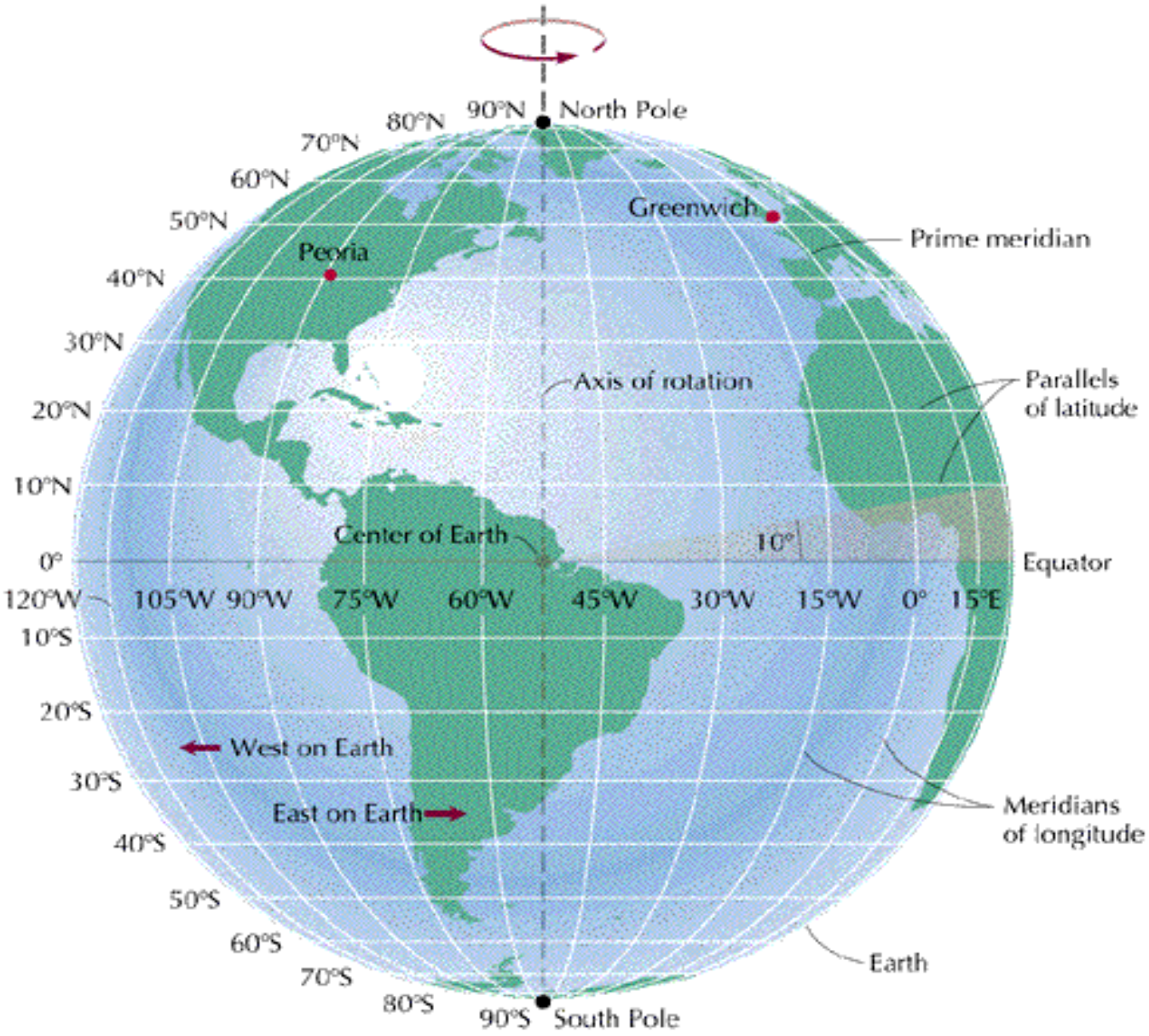
Latitude and Longitude

- Maps are flat models of 3D objects.
- People have been making maps for 1000's of years.
- The science of map making is Cartography.

- Cartographers use an imaginary grid of parallel lines to find places on Earth.
- In this grid, the equator circles the Earth horizontally exactly halfway between the north and south poles.

Latitude

- Latitude lines on a map run parallel to the equator to both poles
- Latitude is the distance in degrees north or south of the equator.


90°N
North Pole
80°N
70°N
60°N
50°N
40°N
30°N
20°N
10°N
0°
10°S
20°S
30°S
40°S
50°S
60°S
70°S
80°S
90°S
South Pole
Greenwich
Prime meridian
Peoria
Axis of rotation
Parallels of latitude
Center of Earth
10°
Equator
120°W
105°W
90°W
75°W
60°W
45°W
30°W
15°W
0°
15°E
West on Earth
East on Earth
Meridians of longitude
Earth

Degrees of Latitude

- Each degree of latitude is about 111 km
- Cartographers knew that Earth was a sphere and that a sphere can be divided into about 360 degrees.
- They also knew that the Earth was about 40,000 km around.
- So by dividing 40,000 by 360^{o} ; you get about 111.

Degrees of Latitude

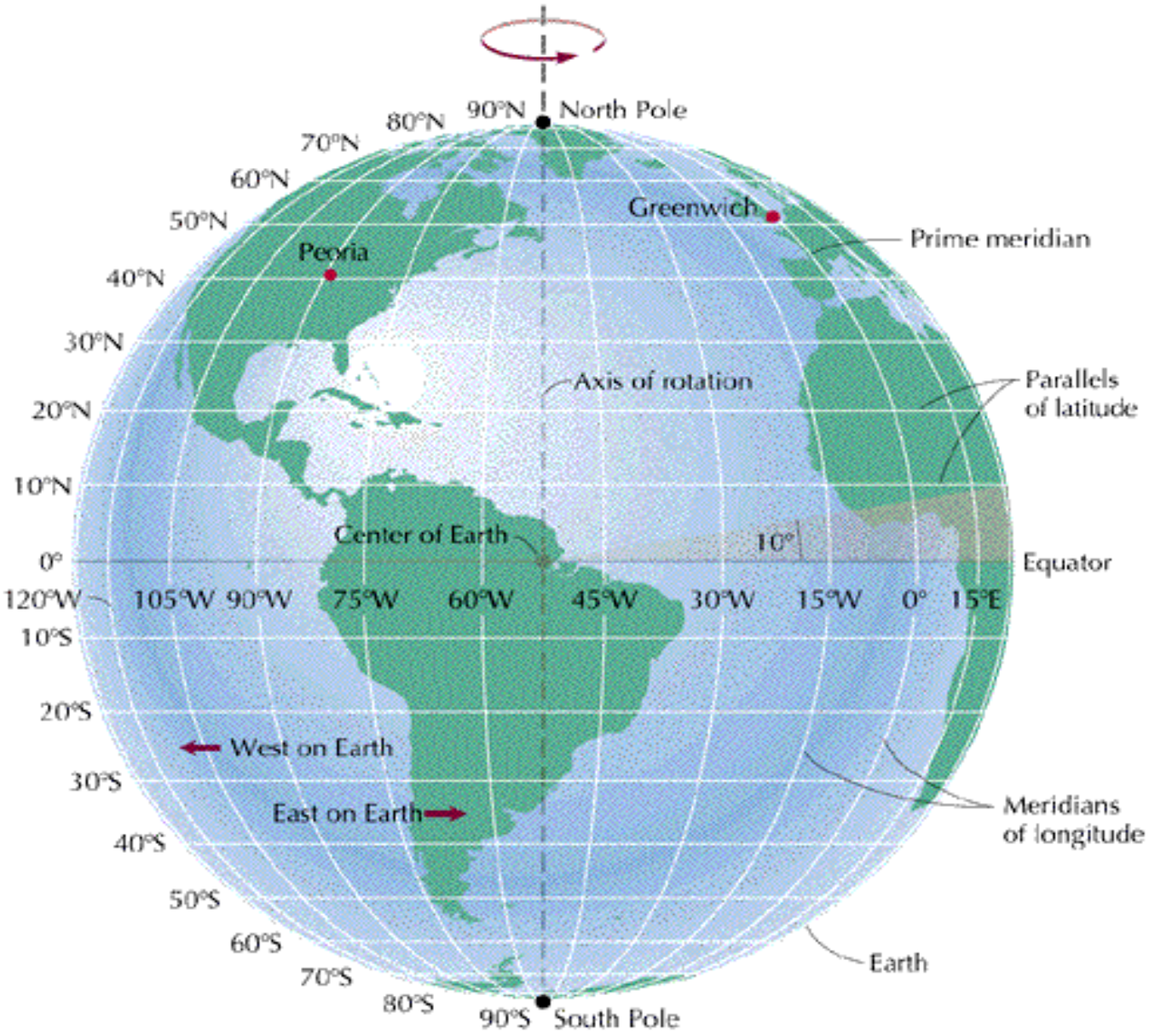
- To find places on Earth more exactly, degrees of latitude are broken into 60 smaller units called minutes.
- The symbol for minute is ‘.
- Minutes can be further broken into seconds and are symbolized by “

Longitude

- Cartographers use lines of longitude to find places in east and west directions.
- Longitude is the distance in degrees east or west of the prime meridian.
- The prime meridian is 0^{o} longitude.
- It is located in Greenwich, England.

Longitude

- Longitude lines are not parallel.
- They are large semicircles that extend vertically from pole to pole
- The line of longitude on the opposite side of Earth from the prime meridian is the 180^{o} meridian.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Meridians of longitude
Earth

Latitude and Longitude

- We need both latitude and longitude to find exact places on Earth.

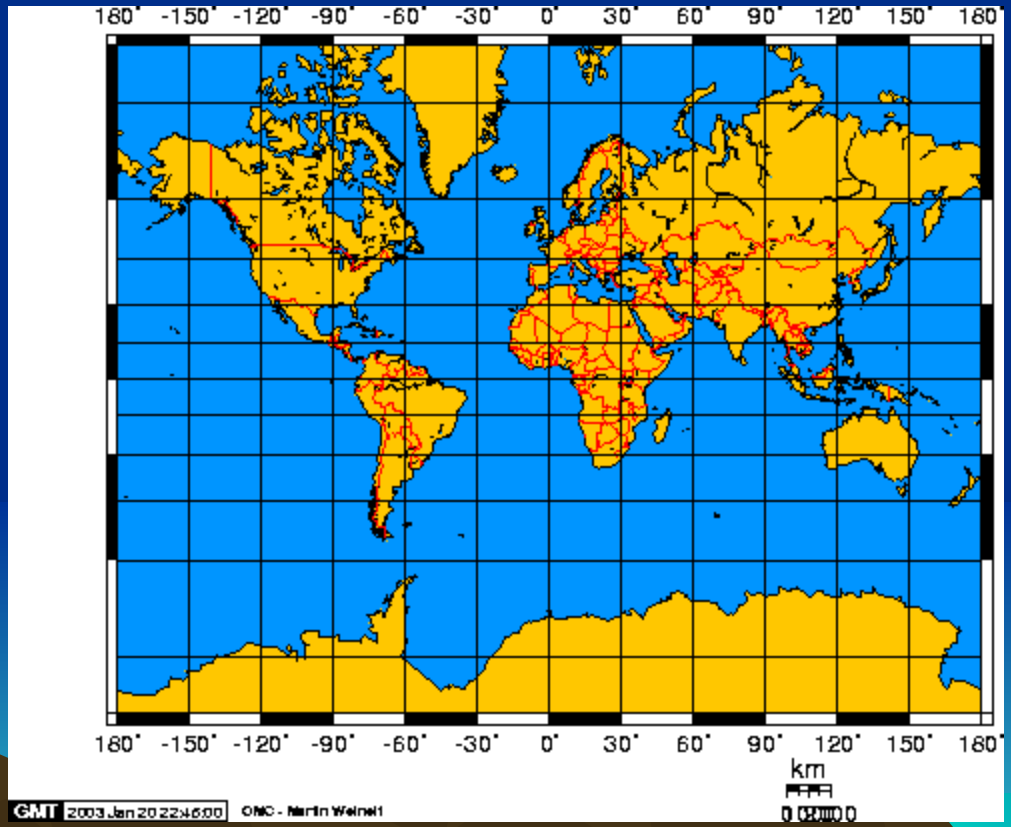
- The latitude and longitude of Lawrenceburg, Kentucky is:
- **38° 2' 14" N / 84° 53' 48" W**

Learning Targets

- Describe the difference between latitude and longitude
- Explain why it is important to give a city's complete coordinates when describing its location

Types of Maps

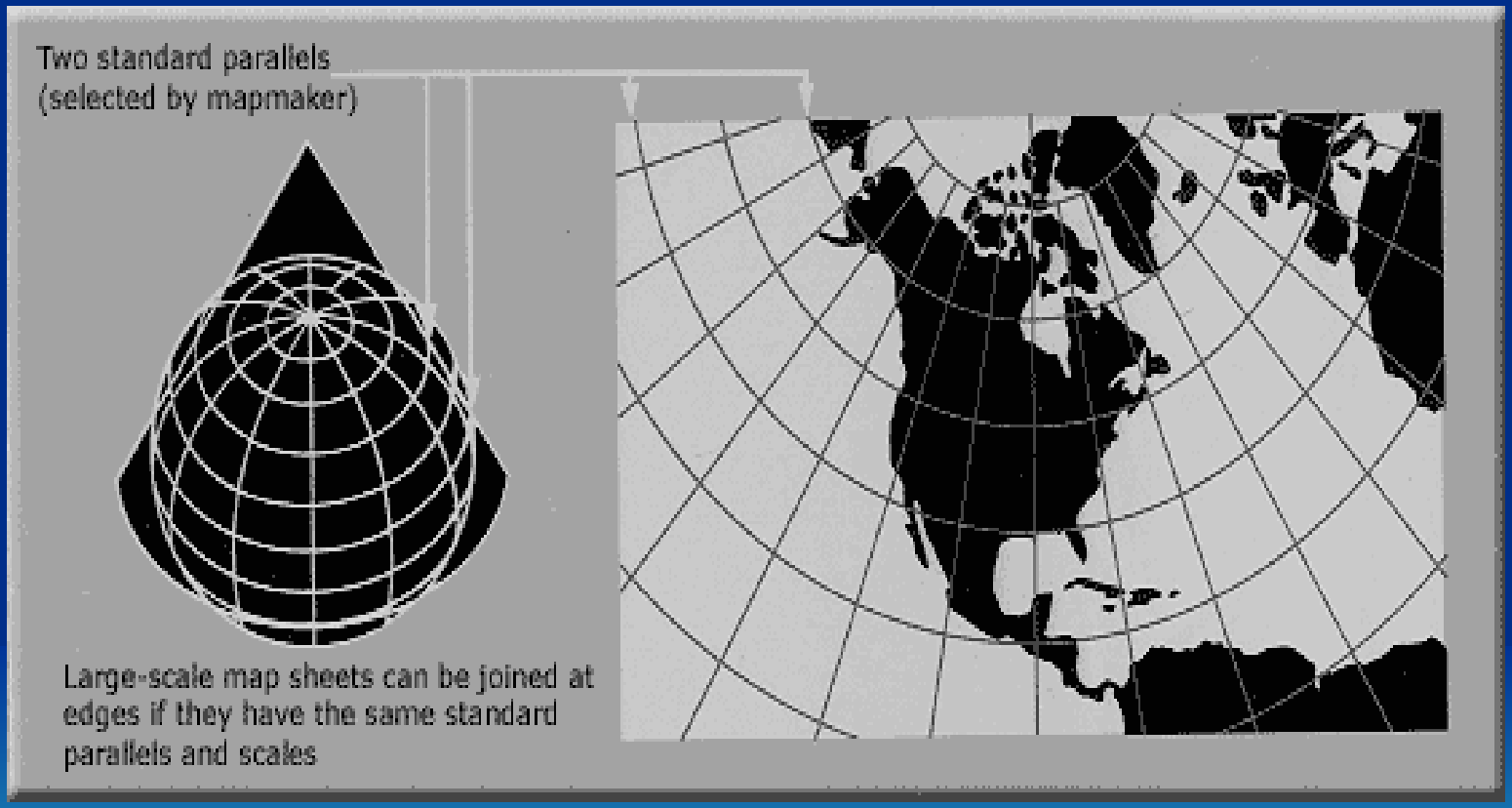
- Mercator Projection
  - Has parallel lines of latitude and longitude



Mercator Projection Maps

- Shows parallel lines of latitude and longitude
- It is a flat map that has the longitude lines parallel making some land masses appear larger than they are.
- Greenland is really smaller than Australia

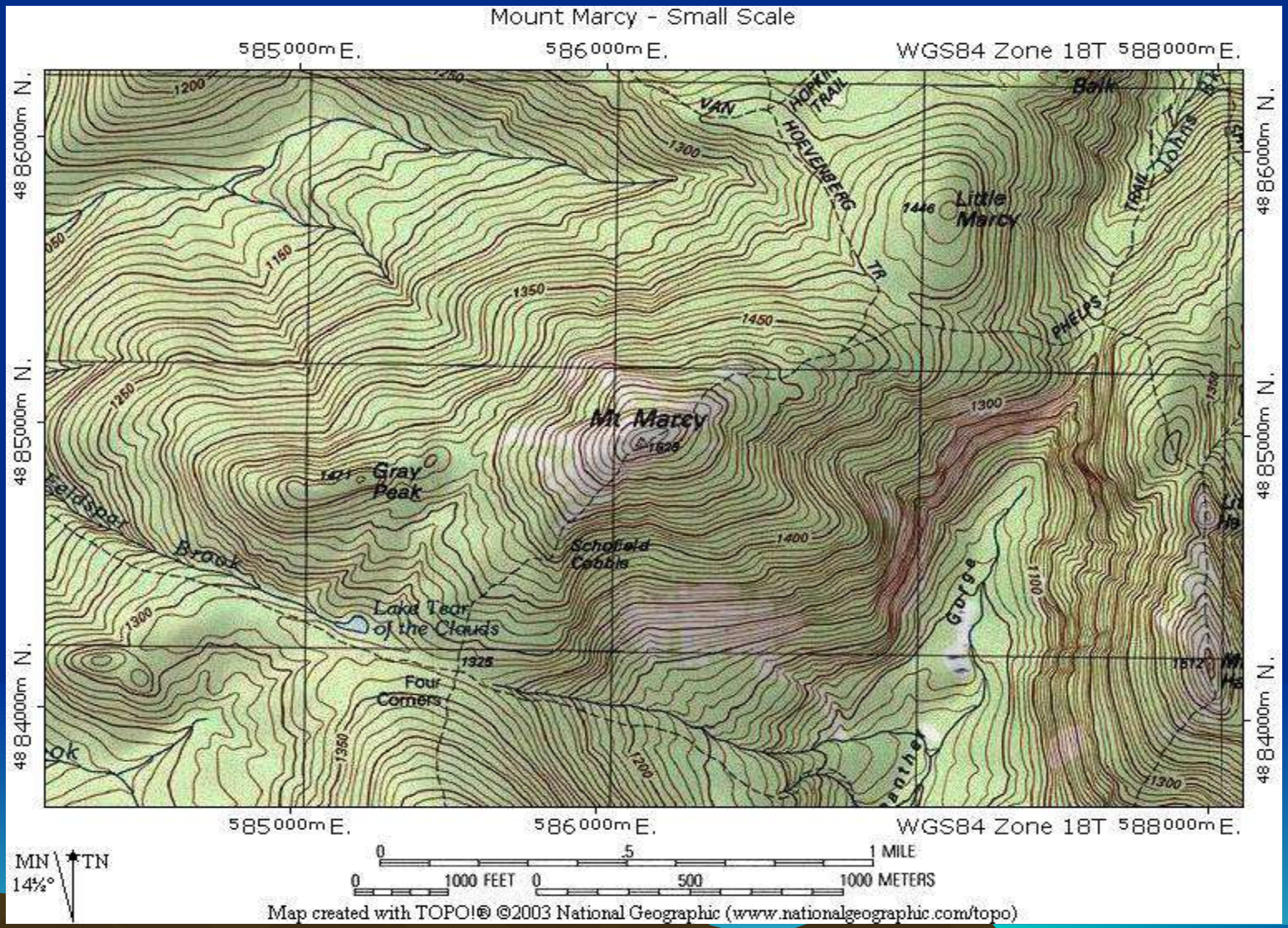
Conic Projection Map



Conic Projection Maps

- This map is made by projecting points and lines from a globe onto a cone
- The cone touches the globe at a specific site
- Little distortion at the place of contact but can be very distorted the farther away you get from the place of contact
- Very accurate for mapping small areas. Good for road and weather maps.

Topographic Map



Topographic Maps

- These maps show changes in elevation on Earth's surface.
- Also show mountains, streams, forests, bridges and so on
- Use lines, symbols and colors to show changes in elevation and to show features on Earth's surface

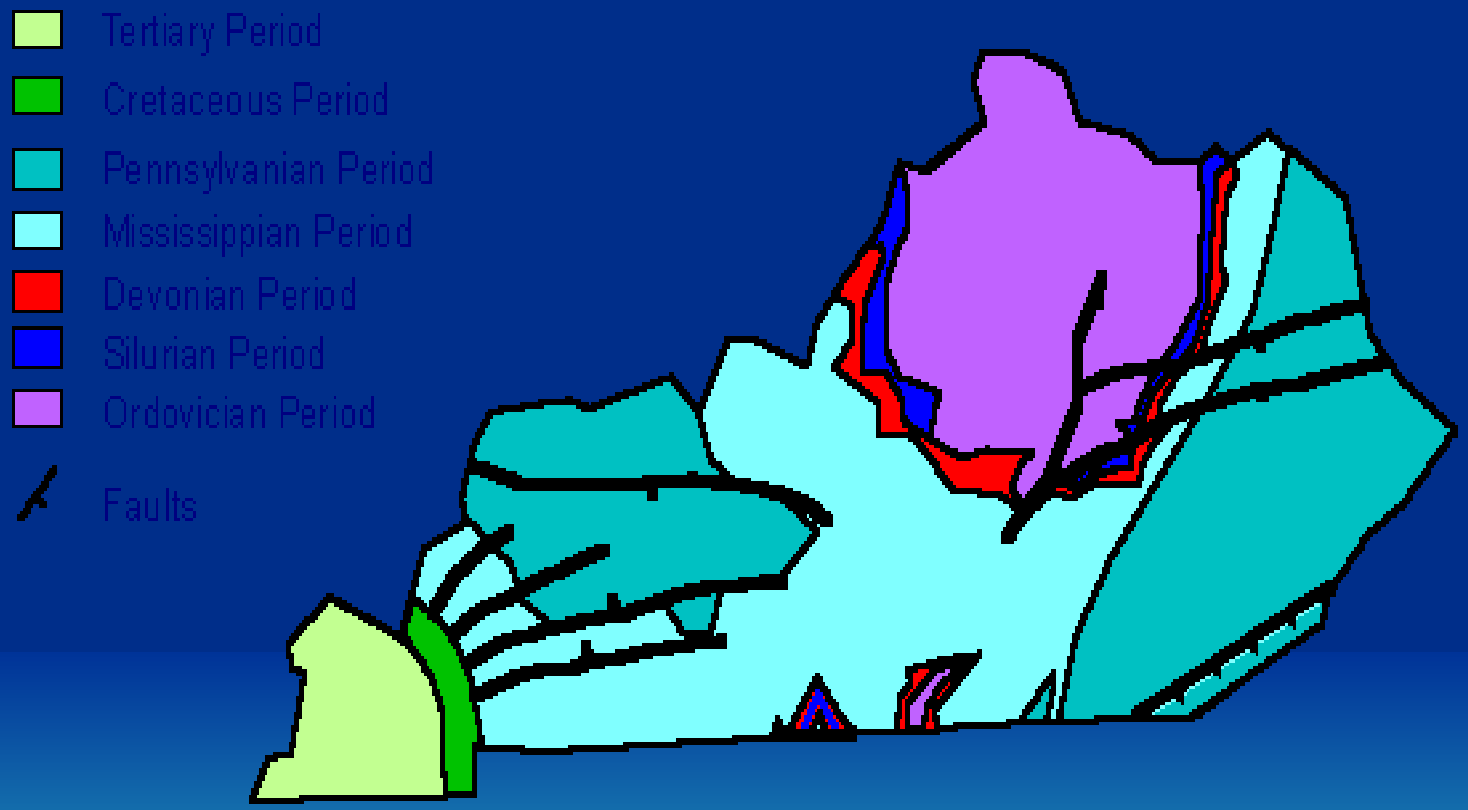
Topographic Maps

- Elevation is shown by using a contour line
- A contour line connects points of equal elevation.
- The difference in elevation between two side-by-side contour lines is called the contour interval.

Geologic Maps

- Are used to show the distribution, arrangement, and type of rocks located below the soil.
- Often are superimposed over topographic maps and color coded by type of rock formation.

Geologic Map of Kentucky



Learning Targets

- Compare and contrast different types of maps
- Explain why different maps are used for different purposes