Maps and Map Skills

United States Geological Survey, 7.5 minute topographic quadrangle map.

- Surface features
- Location (longitude / Latitude Grid)
- Distance (scale)
- Direction
- Topography / elevation (contour lines)

Location

- numerical grid overlain on map
- Longitude and Latitude
- UTM (Universal Transverse Mercator)
- Other county, state, local grids
10. LATITUDE/LONGITUDE

- North Pole (90° North Latitude)
- Prime Meridian (0° Longitude)
- Equator
- South Pole (90° South Latitude)

Parallels
- North Latitude
- South Latitude

Meridians
- Longitude
- Prime meridian

Microsoft Illustration
Grid Coordinates
Lat. 40° 42' 30" N
Long. 73° 35' 00" W
UTM Coordinates

Direction

- Compass bearing from point A to point B
- Measured in degrees around a circle
- Azimuth (0°-360°)
- Quadrant (0°-90°, NE, SE, SW, NW)
The Compass Rose

Azimuth

Bearing 315°

Quadrant

Bearing N 45° W

Azimuth

Bearing 225°

Quadrant

Bearing S 45° W

Magnetic Declination - the difference between magnetic (compass) north and true (polar) north.
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Distance

- Scale: the size of the map relative to the area it represents.
- Shown graphically (bar scale)
- Shown as a numerical fraction (ratio scale)
How to estimate distance using the ratio scale

Example: what is the distance from Axinn Library to Nassau Coliseum?
How to estimate distance using the ratio scale

1. Measure distance on the map.

- Use inches for miles
- Use cm for kilometers

2.5 inches

6.4 cm
How to estimate distance using the ratio scale

1. Measure distance on the map.
2. Multiply by map scale.
3. Convert to miles / km.

- 2.5 inches x 24,000 = 60,000 inches
- 6.4 cm x 24,000 = 153,600 cm

Scale 1:24,000

Topography / Elevation
- Represented by topographic contour lines
Closed contour lines represent a hill (mountain) or a hole (depression).

A single contour line represents a single elevation along its entire length. In other words, the elevations of all points along a contour line are the same.
Contour lines **never** split, cross or intersect. At a vertical cliff they do, however, come together and touch.

The elevation of a contour line is always a simple multiple of the **contour interval**. By convention, each fifth contour line is an **index contour** (drawn as a thicker line than adjacent contours and numbered somewhere along the line).

Widely spaced contour lines indicate a gentle slope. Closely spaced contour lines indicate a steep slope.
Where a contour line crosses a stream or a valley, the contour lines form a “V” that points upstream or up the valley.

Where two adjacent closed contours indicate opposite slopes (hachured contour next to a normal contour) both are the same elevation.

A hachured contour line, lying between two different contour lines, is the same elevation as the lower line.
A closed contour line, lying between two different contour lines, is the same elevation as the higher contour line.

The **datum or zero elevation** is defined as **mean sea level**. The beach is always at zero elevation.

Every contour line eventually closes on itself. However, any one map will not be large enough to show the full extent of all contour lines, and some will simply end at the edge of the map.

Where one closed contour line surrounds another, the inner contour line marks the higher elevation. If the contour lines are hachured, then the inner contour line marks the lower elevation.