IMPORTANT: *Please refer to the Preface for Topographic Map Activities for preliminary instructions and information common to all Topographic Map Activities in the series.*

Topographic Map Activity 5 - Converting Latitude/Longitude In Decimals To DMS Notation (Revision 07-28-20)

Objective: To convert values for latitude and longitude expressed in degrees with a decimal extension (36.625°) to values expressed using degrees, minutes and seconds (36° 37' 30").

Background: Angles have been expressed in degrees, minutes, and seconds (called DMS notation) since ancient times (see history). Although modern technologies favor the decimal extension expression, you will still see DMS notation used today. The Topo Maps we are working with are 7.5' x 7.5' quadrangles. Yet, the latitude and longitude are written on the map corners using decimal extensions (36.125°). Also, the Geospatial Location Tool provided with the Topo Maps gives latitude and longitude in decimal extensions. Thus, anyone using latitude and longitude coordinates should be skilled in converting values between the two systems, especially since it is easy to do.

Activity: Open the La Madre Spring 7.5' x 7.5' quadrangle topo map (if you previously saved it on your computer you don't need to download it again). Once the map is downloaded and open, check that all layers are being shown. Use your mouse or fingers (depending on the device you are using) to scroll around and zoom in or out. Scroll to the northwest corner of the map and read the longitude (115.6250°).

Convert 115.6250° to DMS notation

Covert .6250° to minutes (')

.6250° · 60 minutes per degree = 37.5 minutes

Convert .5 minutes to seconds (")

.5 minutes · 60 seconds per minute = 30 seconds

So, 115.625° = 115° 37' 30"

Now, let's convert 111° 23' 18" to a decimal extension

Convert 18" to minutes

18 seconds ÷ 60 seconds per minute = .3 minutes

Convert 23.3' to degrees

23.3 minutes ÷ 60 minutes per degree = .3883 degrees (rounded to 4 places after decimal point)

So, 111° 23' 18" = 111.3883° (rounded)

Note that the difference between either the longitudes or the latitudes from corner to corner of the Topo Map is .125° ($\frac{1}{8}$ of a degree), which corresponds to 7.5' ($\frac{1}{8}$ of a 60').

Feedback