

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 12 - Working with Compass Bearings (Revision 08-09-20)

Objective: To enhance the sense of direction by working with compass bearings.

Background: We have all heard someone exclaim “I need to get my bearings!” They usually mean that they are not certain, at the moment, of directions (north, south, east, and west). Fortunately, we usually move around on streets, sometimes trails, dotted with signs showing us the way. However, when we are on unfamiliar ground without such signs we need some tools to find direction. One tool is the sun, which rises in the east and sets in the west (but that could vary from 045° to 135° for sunrise and 225° to 315° for sunset, depending on the location on earth and the day of the year). There is moon rise and set (with similar issues). Also, there is the North Star, Polaris (if it’s not cloudy). Another tool is the Topo Maps. The right and left sides of each map are on lines of longitude going through both poles, so, they indicate true north (0°) and true south (180°). The top and bottom sides of each map are on lines of latitude that are parallel to the equator, so, they indicate true east (90°) and true west (270°). A magnetic compass is another tool, and it can be used together with a Topo Map, however, it points to the magnetic pole and not the North Pole (The difference is called *declination* and must be corrected for. [Finding Your Way with a Map and Compass](#)). Another tool is to use landmarks (highly visible and recognizable geographic features) to provide a clue to direction.

Activity: Open the [La Madre Mountain](#) 7.5' x 7.5' quadrangle Topo Map. Look in the bottom margin of the map for the direction arrows: true north (pointing to a star), magnetic north (MN), and grid north (GN). Note: a magnetic compass, used in this location, will point 13° 48' higher than true north, and needs to be corrected accordingly; and grid north is 55' higher than true north (closely examine near all sides of the map and notice that the entire grid system appears to have been rotated clockwise about 1°). Scroll around the map for landmarks. If we could find two landmarks with the exact same longitude then an imaginary line between the two would show true north and south. Likewise, if we could find two landmarks with the exact same latitude then an imaginary line between them would show true east and west. The best two landmarks in the La Madre Mountain area are the far right summit of La Madre Mountain and the summit of Turtle Head Mountain. Both are highly visible and recognizable from most locations in the surrounding area. Using a 360° protractor on a line drawn from the summit of Turtle Head Mountain to the far right summit of La Madre Mountain, this line points to 340° true. The line in the opposite direction points to 160° true. Or we can use latitude and longitude for these two points to get the compass bearing (<https://planetcalc.com/7042/>). Now, these landmarks and this line can be used to quickly get our bearings! We can approximate the direction for *cardinal points*, *inter-cardinal points*, and *secondary inter-cardinal points*.

Cardinal Point	Degrees	Inter-cardinal Point	Degrees	Secondary Inter-cardinal Point	Degrees
North	0	Northeast	45	North Northeast	22.5
East	90	Southeast	135	East Northeast	67.5
South	180	Southwest	225	East Southeast	112.5
West	270	Northwest	315	South Southeast	157.5
				South Southwest	202.5
				West Southwest	247.5
				West Northwest	292.5
				North Northwest	337.5

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