

USES OF COMPASS



Turning the compass scale on the map (D - the local magnetic declination)



When the needle is aligned with and superimposed over the outlined orienting arrow on the bottom of the capsule, the degree figure on the compass ring at the direction-of-travel (DOT) indicator gives the magnetic bearing to the target (mountain).

A magnetic compass points to magnetic north pole, which is approximately 1,000 miles from the true geographic North Pole. A magnetic compass's user can determine true North by finding the magnetic north and then correcting for variation and deviation.

Variation is defined as the angle between the direction of true (geographic) north and the direction of the meridian between the magnetic poles. Variation values for most of the oceans had been calculated and published by 1914.[10] Deviation refers to the response of the compass to local magnetic fields caused by the presence of iron and electric currents; one can partly compensate for these by careful location of the compass and the placement of compensating magnets under the compass itself. Mariners have long known that these measures do not completely cancel deviation; hence, they performed an additional step by measuring the compass bearing of a landmark with a known magnetic bearing. They then pointed their ship to the next compass point and measured again, graphing their results. In this way, correction tables could be created, which would be consulted when compasses were used when traveling in those locations.

Mariners are concerned about very accurate measurements; however, casual users need not be concerned with differences between magnetic and true North. Except in areas of extreme magnetic declination variance (20 degrees or more), this is enough to protect from walking in a substantially different direction than expected over short distances, provided the terrain is fairly flat and visibility is not impaired. By carefully recording distances (time or paces) and magnetic bearings traveled, one can plot a course and return to one's starting point using the compass alone.[5]

Compass navigation in conjunction with a map (terrain association) requires a different method. To take a map bearing or true bearing (a bearing taken in reference to true, not magnetic north) to a destination with a protractor compass, the edge of the compass is placed on the map so that it connects the current location with the desired destination (some sources recommend physically drawing a line). The orienting lines in the base of the compass dial are then rotated to align with actual or true north by aligning them with a marked line of longitude (or the vertical margin of the map), ignoring the compass needle entirely.[5]The resulting true bearing or map bearing may then be read at the degree indicator or direction-of-travel (DOT) line, which may be followed as an azimuth(course) to the destination. If a magnetic north bearing or compass bearing is desired, the compass must be adjusted by the amount of magnetic declination before using the bearing so that both map and compass are in agreement.[5] In the given example, the large mountain in the second photo was selected as the target destination on the map. Some compasses allow the scale to be adjusted to compensate for the local magnetic declination; if adjusted correctly, the compass will give the true bearing instead of the magnetic bearing.

The modern hand-held protractor compass always has an additional direction-of-travel (DOT) arrow or indicator inscribed on the baseplate. To check one's progress along a course or azimuth, or to ensure that the object in view is indeed the destination, a new compass reading may be taken to the target if visible (here, the large mountain). After pointing the DOT arrow on the baseplate at the target, the compass is oriented so that the needle is superimposed over the orienting arrow in the capsule. The resulting bearing indicated is the magnetic bearing to the target. Again, if one is using "true" or map bearings, and the compass does not have preset, pre-adjusted declination, one must additionally add or subtract magnetic declination to convert the magnetic bearing into a true bearing. The exact value of the magnetic declination is place-dependent and varies over time, though declination is frequently given on the map itself or obtainable on-line from various sites. If the hiker has been following the correct path, the compass' corrected (true) indicated bearing should closely correspond to the true bearing previously obtained from the map.

Source: <http://web.ua.es/docivis/magnet/compass.html>