

Using a Compass to Navigate Your Club Site



Essential Questions:

How can I use a compass to orient myself on my site?

How can I use a compass when making a map?

Background

If you have ever been lost outdoors and happened to have a compass with you, you know what true lifesavers these tools can be, especially when used with a map.

We all know about the North and South Poles, those cold places where the polar bears (and Santa) and penguins live, respectively. These are the geographic North and South poles. They are located at 90 degrees latitude North and South. They are the locations at which all longitudes of the Earth come together. The axis of the Earth runs through these poles, and the Earth rotates around this axis. Geographic north is considered “true” north and this is what is used for creating maps.

What you may not know though, is that the Earth actually has two north poles and two south poles. The others are called the magnetic North and South Poles. Compasses are tools used to locate the direction of magnetic North. Just like a bar magnet has two ends called poles, so does the Earth. And just like a bar magnet, the Earth has a magnetic field. If you were to have two bar magnets, you could see that the north and south poles attract each other, but when two north ends are put together (or two south ends), they repel. Because compass needles are magnetized, they always point to magnetic north. Magnetic north and geographic north are different by a few degrees. The angle between these two norths is called “declination”. Technically when making and reading a map, the angle of declination for your location should be known and this number of degrees would be added or subtracted to the degrees measured by the compass. If you are in the eastern United States, you would add degrees; if you are in the western United States, you would subtract. The states of Washington and Maine have the greatest degrees of declination in the United States with 20 degrees declination.

Because this can be difficult to understand, when using a compass to make your GEN Standards Checks Maps, club members could decide whether the maps will use magnetic north or geographic north. If using magnetic north, the north located with your compass would be north on your maps. If using geographic north, there would need to be an addition or subtraction of degrees declination from the degree measurement of your compass’ north. This number would be easy to find out for your location and would always remain the same for your maps as long as they are all made from the same GEN club site.

Location: club site

Objective: *Learners will*

- 1) use a compass.
- 2) record location on a club site map by using a compass and estimating distance with steps and strides.

Skills:

Compass reading, mapping, cooperation

Supplies:

- Compass
- Map template
- Clipboard
- Pencil
- Calculator
- measuring tape

Subjects: geography, math

Time: 30 minutes

Compasses measure direction in degrees, and circles are made up of 360 degrees. When looking at the round face of the compass, you can see that the 360 degrees that make up the circle of its face are marked starting with 0 at the top. The measurement of degree increases clock wise. East is at 90 degrees, South at 180, West at 270, and North at 360 or 0 degrees. Your location in terms of degrees is called your “bearing”. In order to determine your bearing with respect to a certain feature of your club site, you would first point the arrow on the circular plate surrounding the face of your compass toward this feature. Next turn the dial of the compass until North matches the tip of the compass needle. The arrow of the surrounding plate will be pointing to a number in degrees on the dial; this is the bearing for the landscape feature on your club site or landmark.



Measuring Strides

A great way that scientists estimate distances in the field is to measure their strides. A stride is a comfortable step, not too close together and not too far apart - about a shoulders' width apart. When adults measure their strides, it is usually about three feet. This measurement will be less for GEN Club members. When the length of a stride is known, then a distance can be “walked off”. This means that someone would walk the distance while counting the number of strides. The number of strides can then be multiplied by the length of one stride to come up with an estimation of the distance. The best way to be as accurate as possible with this method of measuring would be to choose one person for each data collection team to be the strider. This will allow the measurements for maps will be as similar as possible for each distance measured. Another way to be as accurate as possible would be to take an average of strides. Before you start measuring, take three or more measurements of your strider's stride and average them (add measurements together and divide by the number of measurements).

Adding Features to your Standards Checks Map

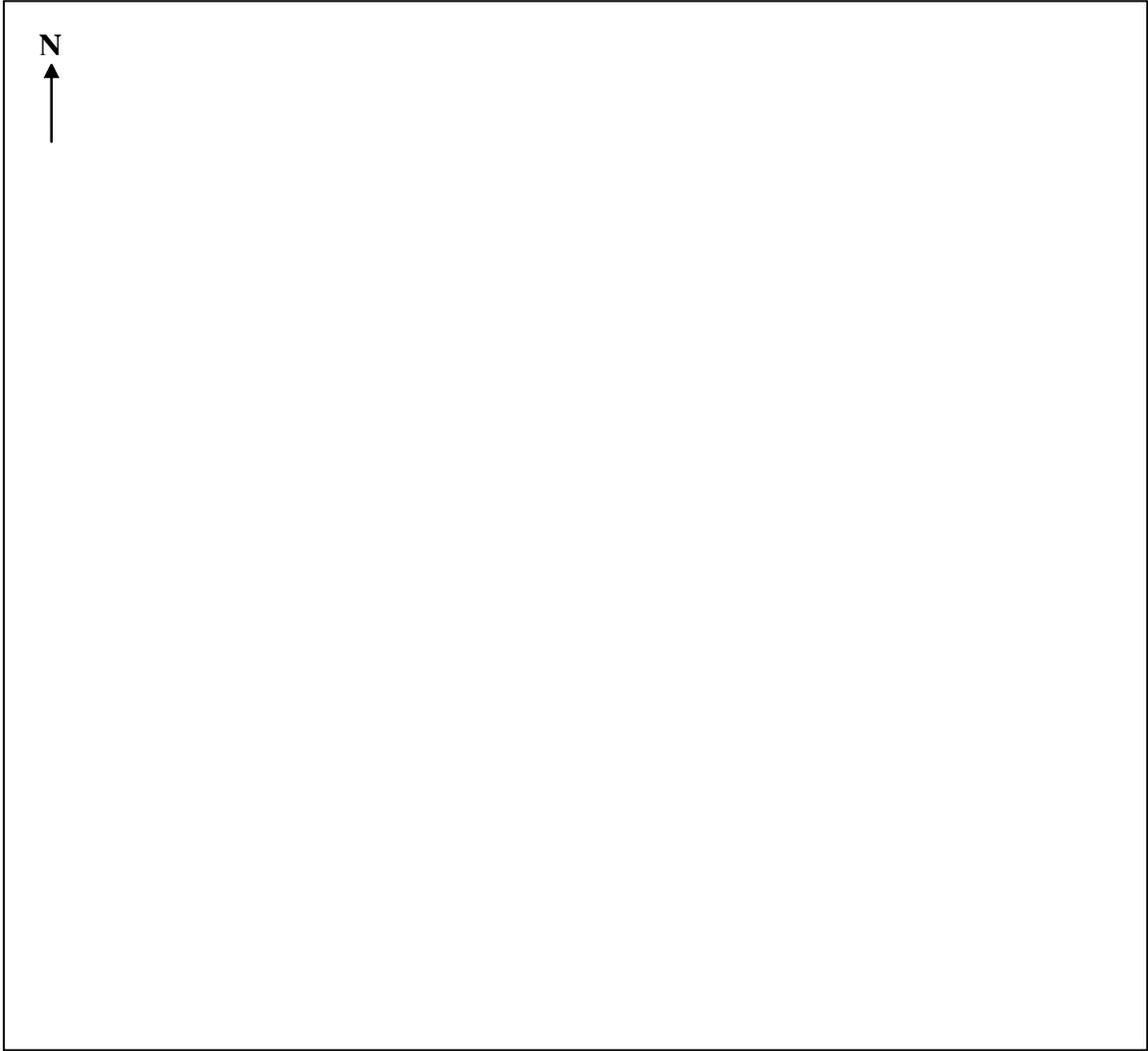
The following map is a template that can be used for all standards checks. When recording location information regarding standards checks on the map, club members can work in groups to locate direction with a compass, measure distances to landmarks with tape measures and strides and record information with drawings and text on the map template.

Vocabulary:

- geographic north
- magnetic north
- declination
- bearing
- estimation
- stride
- average

Standards Checks Map

Data Collection Team: _____ Date: _____



Legend:

Scale: