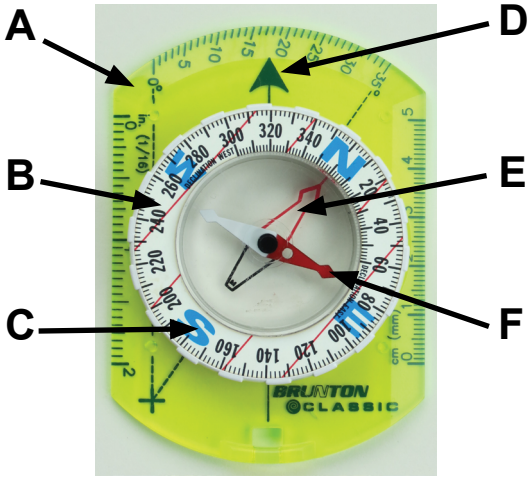
Investigation Instruments: Compass

Using a Compass

A compass is useful for many applications. In the case of GLOBE field investigations the compass will be used to set up field sites that can be measured and returned to every year. In addition, the a compass is used to help orientate soil temperature and moisture sites, ensure that the door to the Atmosphere Instrument Shelter is facing away from the Equator, and in noting direction on all site maps (e.g., Hydrosphere).

Investigating a Compass



1. Review the parts of the compass.
   A. Base Plate
   B. Housing and Degree Dial
   C. Cardinal Direction Indicators (N, S, E, W)
   D. Direction of Travel Arrow
   E. Orienting Arrow
   F. Magnetic Needle
2. Examine the degrees noted on the housing of your compass. Degrees are typically in increments of 2° or 5°.
3. Hold the compass flat in the palm of your hand with the direction of travel arrow pointed away from you.
4. Practice turning the housing.
5. The red part of the magnetic needle points toward Earth's magnetic north pole.
6. Move slowly around the area or in a circle; watch how the needle always points the same direction. If the needle doesn't always point in the same direction look around to see if there any metal objects around (e.g., jacket zippers, keys, clipboards, field tools, desks, etc.).

Magnetic Declination

As you may know, there are two North Poles on Earth. Magnetic North – where the compass points – is an area of highly magnetic rock under central Canada. True North is geographically at the top of the Earth (90° N) – maps are based on True North. Declination is the angle between the two. The size and angle depends your location. Declination is important to navigating correctly and can also be important in orienting your sample site to satellite images. Compasses have either a mechanism to set the declination so it is accounted for in your compass reading or a scale to make the calculation yourself. (To find your local declination, see *GPS Investigation: World Magnetic Declination Map*.)

Note: it is extremely important to ensure that your compass is level when reading it. Make sure that the needle is not dragging or rubbing against the top or bottom of the needle capsule.

How to Use a Compass

Goal 1: Face North

- Hold your compass in front of you, turn the housing dial until the N is lined up with the direction of travel arrow – where it says, “Read bearing here”.
- Now turn your body, NOT JUST YOUR COMPASS, until the red part of the magnetic needle is inside of the orienting arrow. A catchy way to remember this is – **Red in the Shed**
- You are now facing north. Practice again using E (90°)

Goal 2: Which direction are you facing?

- Turn your body to face a direction of your choice.
- Turn the housing until Red is in the Shed.
- Read the degrees that are lined up with the direction of travel arrow – this is the azimuth.

Goal 3: Find the azimuth of an object

- Holding the compass correctly in your hand, select a nearby object and turn to face it.
- Turn the housing until Red is in the Shed.
- Read the azimuth – this is the direction to the object from where you are standing.

Goal 4: Pace on an azimuth

- Turn your housing to the desired azimuth for pacing.
- Turn your body until Red is in the Shed.
- Choose an object (or partner) that is in line with your azimuth and pace toward it. This allows you to walk without looking down at your compass, thus creating a straighter path.

This resource was created in part by the GLOBE Carbon Cycle Team, University of New Hampshire