Lesson Overview

This lesson will explore how to use a map and compass for navigating landscapes. Orienteering is a great activity for anyone who wants to get out and discover new areas and skills!

5 Steps:

1. What is a compass?
2. Shooting a bearing.
3. Choosing a map.
4. Orienting a map.
5. Explore your area!

Notes for Parents/Teachers

- What do parents or teachers need to know?
  - Familiarize yourself with a compass prior to starting this lesson.
  - Check to make sure the compass is free of bubbles, as they can cause inaccuracies in the compass.

Age Group:

- 6th Grade to Adult

Total Time Needed:

- 45 to 90 minutes

Materials Needed

- Map, compass, paper, pencil, geocaching app, GPS, and appropriate shoes, clothes, and supplies to be outside.

See more from MOSS Adventure Learning at moss.uidaho.edu/adventure

Orienteering

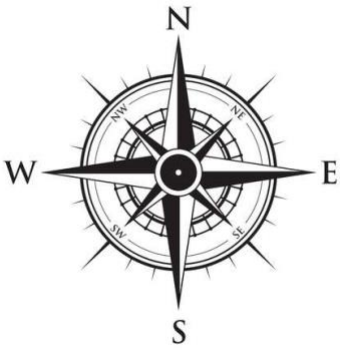
Step 1: What is a Compass?

1. A map and compass can help you orient yourself in a given area.
2. Your compass will point to "Magnetic North," which is different than True North, where the Earth's axis is.
3. Look up your specific location to find what's called "Declination," the difference in angle between True North and Magnetic North and set your compass to it.
    a) Adjusting your compass's declination varies with each brand.
    b) This will give you an accurate reading when using your map and compass!
    c) Click the link below to find your declination https://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml?#declination
    d) You will see something like this
    13° 26' **E** ± 0° 23' changing by 0° 6' W per year
    (Pronounced 13 degrees and 26 minutes)
    So **13°** would be your declination adjustment

Step 2: Shooting a Bearing

A compass can be used to find the direction of travel for a given landmark, this is called "shooting a bearing." For example, instead of seeing a mountain peak in the distance and saying, "that looks like North by Northwest," you could find the specific angle from magnetic north, that will ultimately get you to your destination. Follow these steps below to shoot a bearing!

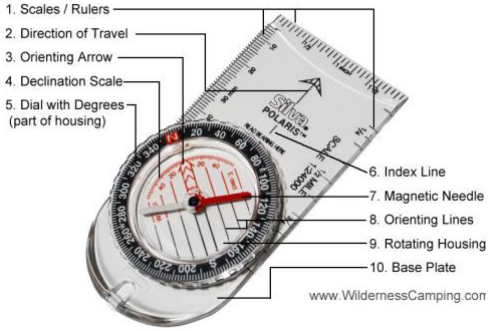
1. Always hold the compass flat.
2. Find desired landmark in sight.
3. Put "Red Fred in the Shed!" (**Magnetized Needle** into **Orienting Arrow**)
4. While keeping Red Fred in the Shed, turn the **Base Plate** so the **Direction of Travel Arrow** is at desired **Bearing** (angle of landmark).
5. As a team, mark out desired distance and walk towards **Direction of Travel** while keeping Red Fred in the Shed.
6. Remember, compasses are NOT always accurate, and metal objects like phones, machinery, and even rock in the mountains can potentially set them off!
7. If you think you made a mistake along the way, go back and try again!



Think about....

- In what scenarios may you want to use a map and compass?
- Why does declination matter? If the magnetic poles slowly move, will your declination change over time too?
- Compasses have been used as early as 2000 years ago in China!

Parts of a compass:



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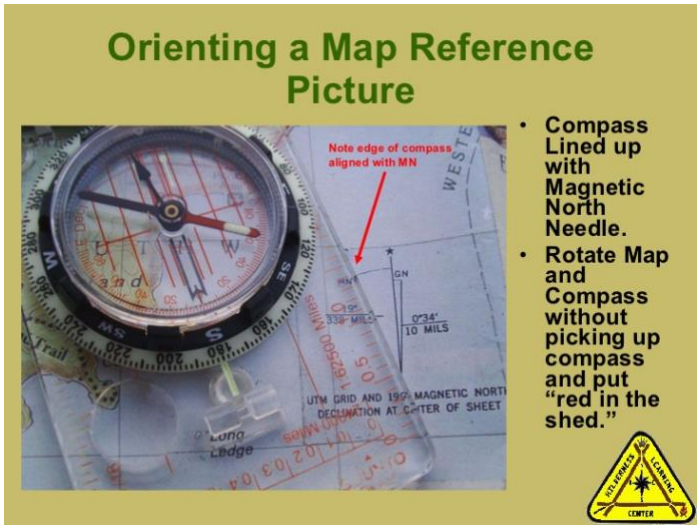
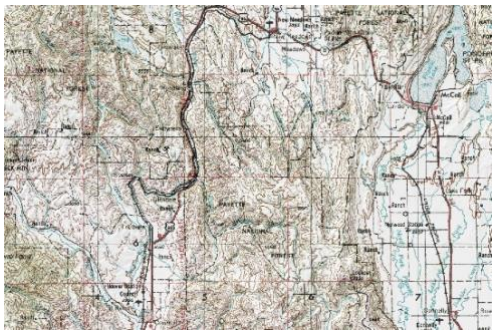
Step 3: Choosing a Map

- What to look for when choosing a map.
  - Clear and easy to read
  - Many maps are Topographic, meaning they show elevation gains and losses with what are called "Contour Lines." Contour lines show the elevation changes that happen on a landscape.
  - A good map should have a legend which includes a "Scale," which determines how zoomed in the map is, a "Compass Rose," so you know which direction north is, and typical landmarks like, trails, peaks, rivers and towns that you might find.
- You can find free printable maps by clicking the link below https://www.mytopo.com/maps/

Step 4: Orienting a Map

1. Place your map on a low flat surface (a flat rock, backpack, or frisbee works well!)
2. With the map lying flat, place your compass on the map. Make sure that the **Direction of Travel** arrow is pointing toward the top of the map.
3. Now locate the **Bezel** (compass housing) and rotate it so that the **Magnetized Needle** and **Orienting Arrow** are aligned with the **Direction of Travel**.
4. Now that your **Base Plate** and arrows are oriented, turn your map until its edges align with your compass. Everything should now be oriented, and you are ready to mark various **Bearings** for direction of travel!





Think about....

- Be aware of your surroundings, as some objects can interfere with the compass.
  - Large metal objects such as, water towers, and vehicles.
  - Large power lines can also interfere with accuracy of the compass by disrupting the magnetic reading.
- If your map is not oriented correctly, will it still work for navigation?

Orienteering

Step 5: Get out and Explore!

- Now that you know how to **a.)** identify a compass, **b.)** shoot a bearing, **c.)** choose a map, and **d.)** orient your map, you can head out into your surrounding areas and practice these skills!
- First, pick a point outside, maybe it's a tree, house, or mountain in the distance. What is its **bearing**? How many steps does it take to get there?
- Second, try using a topographic map to explore off trail. Use your map and known location to travel along a **bearing** to a desired location.
- Try setting up a scavenger hunt through your neighborhood! This could be a great community activity!
- Also, if you find that you like navigating wild areas, try **Geocaching**! A great interactive activity that allows you to embark on a real-life scavenger hunt for goodies and interesting artifacts!
    - You can use apps, websites, or books to begin this adventure. (Some of the apps ask for a premium account or the use of GPS devices.)
    - This is a great site to begin: geocaching.com

Additional Resources:

- REI Inc. has a great informational series on navigation: https://www.rei.com/learn/series/intro-to-navigation
- More information on Earth's magnetic field and compasses: https://adventure.howstuffworks.com/outdoor-activities/hiking/compass1.htm
- How to start Geocaching: https://www.wikihow.com/Go-Geocaching