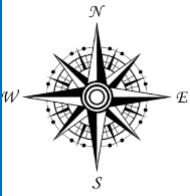




# Navigating the Compass

## How does a compass work?

Most of us have a compass somewhere in our house, but may never use it! A compass is a tool to help you get from one place to another (or navigate) by indicating direction. This happens when a magnetized needle lines up with the magnetic poles of the Earth, which are at the North and South of our planet (like the North pole and the South pole). Think of the way a magnet sticks to your fridge – the magnet is drawn towards the fridge, the same way as this needle is drawn towards the North magnetic pole. Some birds even use this magnetic field to know which way to migrate. Navigators use the four cardinal directions, North, South, East and West to make their way from 1 point to another. Today, magnetized needles you see will have a red or white line that lets you know which way is North.



**N**orth - **E**ast - **S**outh - **W**est are the directions of your compass. I remember the order by going around the compass clockwise while saying **N**ever - **E**at - **S**oggy - **W**affles!

## History of the Compass



Scientists and historians believe that the Ancient Greeks understood magnetism, and that the Chinese may have begun magnetizing needles over 2,000 years ago. The first compasses were made from sticking a magnetized needle onto a wine cork and then letting it float in water. The needle would spin and point towards North. Before these compasses were widely used in travel, people relied on the sun (which rises in the East and sets in the West), the stars and major landmarks to navigate. Pilots and captains had to be careful that the metal on their boats and planes did not disrupt the magnetic power of the compass.

## Why do we need compasses?

Most of us can just turn on our phones and get directions about where to go and how to get there. We don't have to navigate, taking time to plan our route and know which ways to turn ahead of time. There are even phone Apps to help guide us on trails and GPS devices to guide us through the backcountry wilderness. This means that many of us have lost our sense of direction, and would not even be able to make it home without these technologies if we got lost. A compass is still an amazing tool (without a battery) that helps us orient (know where we are) and be aware of our surroundings!



## EXPERIMENT 1: True North

The first step in navigation is to orient yourself. That means becoming aware of your surroundings and finding out where you are. Let's just start from your house!

### You will need:

- 1 compass
- A pencil
- Your observation journal

### Instructions:

1. First, we need to go outside and figure out where we are. Let's go out the front or back of the house where you are able to see landmarks (mountains, river, familiar buildings etc.).
2. Turn the bezel (the spinning wheel with letters) on your compass until the arrow is lined up with the "N" for North (picture on the left). Now rotate your body until the red magnetic needle is sitting inside the red arrow. The way to remember this, is that **RED** should always be in the **SHED** (picture on the right).



3. Once you are facing North-- look up! What do you see? What is a landmark that you will always know is facing North?



4. Now let's turn the bevel East. Rotate your body until the Red arrow is in the Red shed. You are now facing East! What do you see? The sun rises in the East every morning, so if you wake up early enough, and face this direction, you can watch the sun come up.



5. Repeat this exercise in each direction until you feel confident that you know the major land marks in each cardinal direction. This is knowledge that most people used to have, but because of phones and other technology, we are not as aware of our surroundings !



6. You can use this video from REI for more detailed information and tools on how to use your compass.

Watch this  
video for  
detailed  
instruction!



## DIGGING DEEPER! Declination

So, it turns out that when our compass is pointing North, it is not pointing towards the North Pole - it is actually pointing towards magnetic North (which is currently somewhere in Canada). To make up for this imbalance, we can adjust the declination of our compass. Watch the video above for more guidance. To do this, you use the 'key' attached to your compass string to turn your compass 14 degrees East from 0 (if you live in the Roseburg area). Now your compass is ready for very accurate navigation.

## EXPERIMENT 2: Treasure Hunt

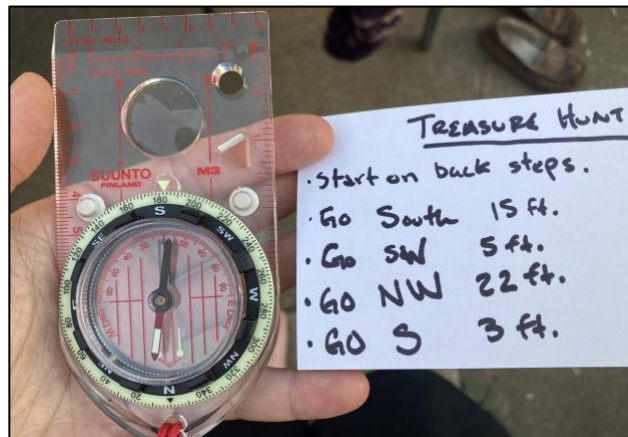
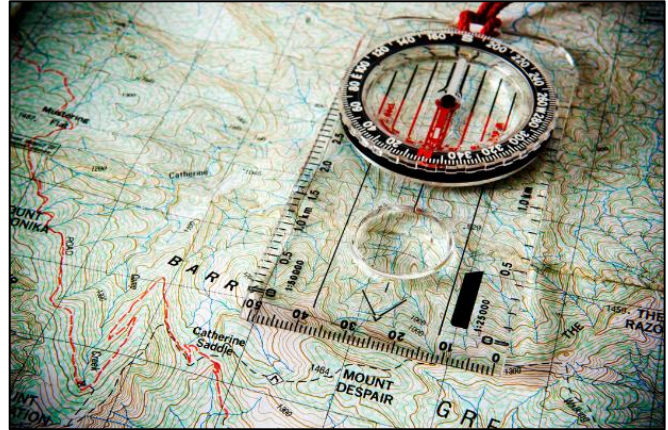
You will need the help of someone in your home to conduct this experiment.

### You will need:

- Treasure
- A compass
- Pencil and paper
- A friend or family member to test your experiment

### Instructions:

1. Choose a starting point near your house where you have lots of space - like the corner of a field, or your back steps.
2. You will be creating a 'secret map' to your hidden treasure. You are only going to give your helper a list of compass directions and distances to travel to your treasure.



3. Begin by choosing a cardinal direction away from your starting point (North, East, South or West) and a distance (5 feet, 10 feet etc.). Adjust your compass and start walking.
4. After a short distance, choose a new direction (away from a building) and start walking. Make sure that you are writing down all of these distances and directions. You can use the main directions N, E, S, W or you can use mid-point direction like Southwest or Northeast! It's ok to lead them in circles, as long as the instructions finish at the treasure.
5. When you come to a good spot, hide or bury your treasure if you are able.



6. Give the other person these directions from the original starting point and see if they can follow them to the right spot! This is your chance to be the teacher and show them how to use a compass!
7. Your treasure could be a small toy, a beautiful flower, some art or an activity you did with other Home Explorers! I guided my helper to some beautiful flowers with the compass directions!



Thanks for conducting science with me for this Home Explorer activity from Umpqua Watersheds Education Program.  
Join me for new activities posted every week!

- Ms. Robyn

