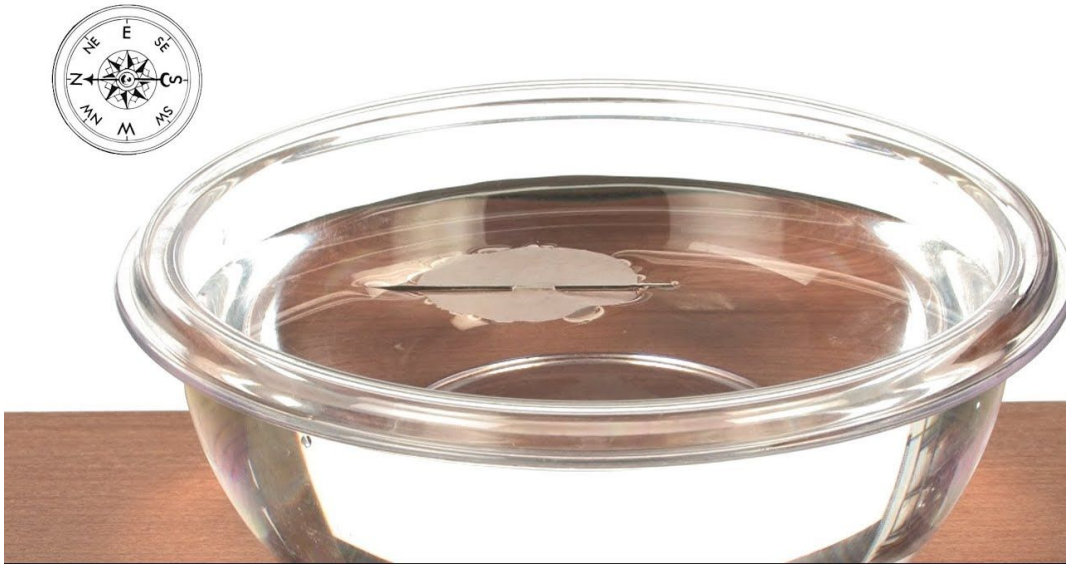
Galena Creek Visitor Center
At-Home Learning Activity

Make Your Own Compass



Summary of Activity

This activity uses common household items to create a functioning compass which students will use to map out their home. Students will learn about the Earth's magnetic field, and how animals use it to navigate around the globe. Younger students may need help, though the activity is appropriate for 1st-8th grade.

Objective:

Students will learn about the Earth's magnetism and how they can use it to make a functioning compass. Students will then use their new-found sense of direction to create an accurate map of their home.

Discipline or Subject Covered:

STEM, Earth's magnetism.

Grade Level:

1st - 8th grade

Materials:

Small bowl, water, cork or cooking sheet, magnet, needle.

Discussion:

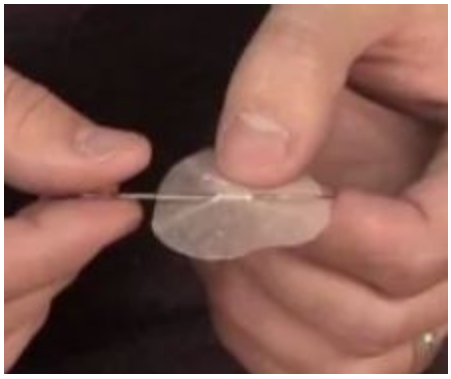
When animals migrate to warmer places in winter, how do they know which direction is South?

This quick activity helps us find the answer. Because the core of the Earth is made of metal (mostly iron) and also spinning extremely quickly, a magnetic field is created between the North and South Poles. Even though humans can't see this magnetic field, many animals (such as birds) use it to orient themselves so that they actually fly south. You could say that they have a sixth sense!

A compass is a device that lets us see this magnetic field, and gives us the sense of direction used by other animals. The reason a compass works is because of the extreme sensitivity of the magnet (in this case a needle) that is able to pick up on this invisible field and align itself alongside it, in the North - South direction. [Note: Keep in mind that the needle will not tell you which direction is North and which is South - it will only show the North-South line. In order to know the exact direction, we either need a specialized magnet or use the methods outlined in the steps below.]

Procedure:

1) Magnetize your needle by running it along a magnet (or anything that it is attracted to) several times in the same direction. A magnet can usually be found on your fridge or other household appliance.

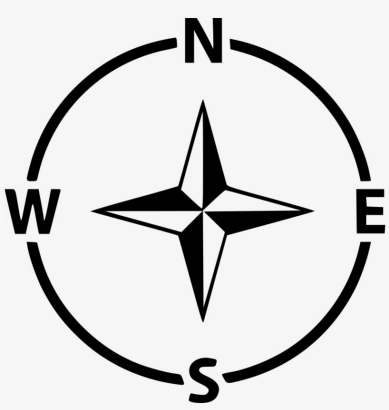


2) Attach the magnetized needle to the parchment paper, wax paper, or a cork.

3) Fill the bowl with water.

4) Place the needle into the water and watch it calibrate (it may spin in circles for a few seconds)

5) Once the needle calibrates, and steadies itself along the North-South field line, you will realize that you still don't know which way is North and which is South! How can we figure this out? Well, a few simple bits of information can help us.
    a) Do you know which direction the sun rises and sets? In case you don't, the sun rises in the East, and sets in the West. By looking out your window and seeing where the sun currently is in the sky (and what time of day!), we can generally figure out which way is East and West.
    b) Next, using the common mnemonic **N**ever **E**at **S**hredded **W**heat, or **N**ever **E**at **S**oggy **W**affles, we can finally figure out what direction our compass is pointing.



6) Now, double-check if the compass is indeed pointing north-south! You can either use a real compass, or a phone app. [*Tip: if your home-made compass isn't working it is most likely because the needle was not magnetized sufficiently. Try rubbing the needle against the magnet, in one direction, for a bit longer*]

7) What can we **do** now that we know which direction is North? Why not map out your house with respect to north:

a) Get out a sheet of paper and some drawing materials, and start by drawing which direction is North-South-East-West on your paper.
b) Next, try making a map of your living space relative to the directions of your compass. Where is the kitchen relative to North? Bathroom? Bedroom? Living room?

8) Feel free to share your map or your working compass with us by posting a picture onto our Facebook page!