

Navigate Like a Bird!

You've likely watched a flock of hundreds or thousands of birds flying south, on TV or in real-life and, wondered how do they know which direction to go? Why it is they they do not get lost?

Scientists don't fully understand how birds are so good at finding their way to their winter homes. But they know that migratory birds use different senses to help them navigate. These birds can tell which direction to go by using the sun, stars, and Earth's magnetic field. They also use the setting sun and landmarks during the day to help them know where they are.



Humans also use landmarks to help get from one place to another, for example from home to the neighborhood park. But for places further away without many landmarks, for example in a forest or out at sea, we will need to use a map and compass. A compass is a device that indicates direction. It is one of the most important instruments used for navigation.



A magnetic compass consists of a magnetized needle that rotates to line up with Earth's magnetic field. The ends point to what are known as the north magnetic pole and the south magnetic pole. So just like a bird we can use the earth's magnetic field to find our way!

In this activity you'll learn how to make your own compass at using materials you have at home!

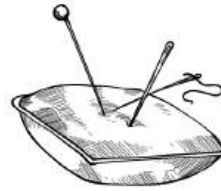


Materials



Needles are sharp. You will need an adult to help you find and use the follow:

- Sewing needle about 1-2 inches long
- Small bar magnet or refrigerator magnet
- A small piece of cork (a flat piece from a wine bottle works but make sure it is cork and not plastic)
- A shallow bowl
- Water
- Pliers



Time to make your compass

1. To magnetize the needle: Rub a magnet along the needle a few times in ONE DIRECTION ONLY
2. Cut off a small circle at one end of the cork (about $\frac{1}{4}$ ' thick)
3. Securely grip the needle with the pliers and with the circle of cork on a flat surface, push the needle through one end of the cork and out the other so that the needle is sticking out of both ends of the cork evenly. (Be careful)
4. Fill the bowl half-way with water and float the "compass" on the surface of the water
5. Place the whole "compass" on a flat surface and watch the needle as it tries to align itself with the magnetic fields. The needle should point towards the nearest magnetic pole (north or south) depending on where you live.
6. Now go test out your new compass and see if you can orient yourself on a map!

Why your compass works

Magnetic fields are like invisible forces made by moving electrical charges. Earth makes its own magnetic field with a north and south poles, just like a giant magnet. Your compass can point towards these poles because the needle in the compass is a tiny magnet that floats and can spin freely in the water. It turns to match Earth's magnetic field, helping you find your way.

