

DIGITAL ACTIVITY

Build Your Own Compass

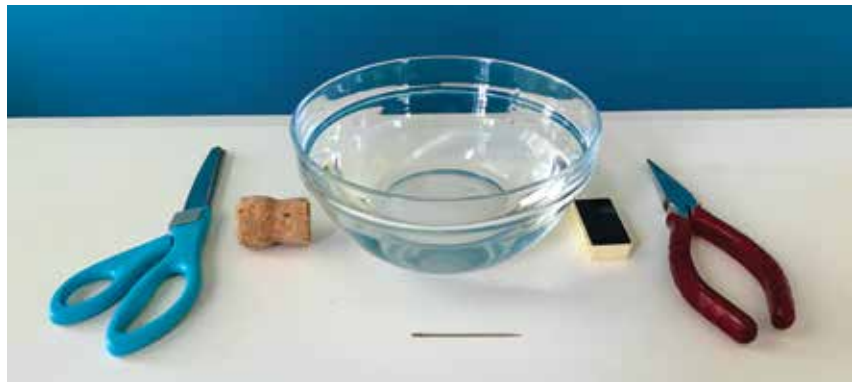


BACKGROUND

Compasses have been in use for nearly 1,000 years. They are devices that indicate direction and are incredibly important for navigation. The compass allowed sailors to sail for greater distances and longer periods throughout the whole year. These tools have continued to be improved upon, becoming more advanced with each passing century. Today compasses are based on the same principles as those built 1000 years ago but are constructed of more advanced and modern materials. Similar to when they were first developed, compasses are still used for navigation, orientation, astronomy, and building. In this activity you will learn how to build a simple compass using common household items.

MATERIALS

- Cork
- Scissors
- Cup or Bowl
- Water
- Magnet (any magnet will work but the stronger the better)
- Pliers
- Metal sewing needle



PROCEDURE

1. Holding the blunt end of the sewing needle, rub the magnet against the needle at least 50 times, moving from the middle of the needle to the needle's tip. When rubbing the needle with the magnet, be sure to rub in a single direction. This process will magnetize the needle.

Take note of which side of the magnet you are using. Flip the magnet to the other side and flip the needle around so you are now holding the pointed end. Take the magnet and rub from the middle of the needle to the blunt end of the needle 50 times. Be sure to rub from the center of the needle toward the blunt end.

2. Take the cork and cut off about 1/4 inch from the end. Once you finish this step you should have a small cork disk that is about 1/4 inch tall.



PROCEDURE (continued)

3. Using the pliers, carefully push the needle through the 1/4 inch side of the cork disk (this step may require help from an adult). Press the needle all the way through the disk until the cork is centered on the needle.

4. Fill a cup or bowl with at least 1 inch of water.

Place the cork and needle onto the surface of the water. Try to keep the disk from touching the sides of the cup or bowl.

5. Observe the needle (it should align to the north and south poles).

WHAT HAPPENED

If successful, you should have seen the needle align with the north and south poles. Why does this happen?

Compasses work on the principle of magnetism. Through the process of rubbing the magnet on the needle, the needle became magnetized and functioned as a temporary magnet. As a magnet, the needle is able to interact with Earth's magnetic field.

The magnetic field surrounding earth is relatively weak. However, by floating the needle in water it is able to react freely with the Earth's magnetic field. This means that the needle, while magnetized, should always align itself so that one end points north while the other points south. The same end should always point in the same direction.

Be sure to check out our video at FloridaMaritimeMuseum.org/pip-the-pelican.

EXTRA FUN

Try carefully walking around the room with the compass or move it around on the table.

What happens when you do this?

What happens when you bring the magnet close to the needle?

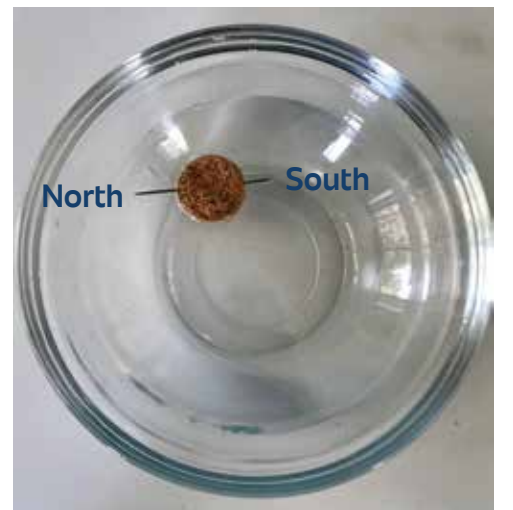
What happens if you create a second compass and add it to the bowl?



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