

A compass by another name...

(...is called a magnet!)

Follow the exact* footsteps of the earliest experiments on magnets and learn how 2 cultures named the poles of a magnet differently. Find out why *repulsion* is more informative than *attraction* by observing the interactions of magnets with each other and some other types of materials.

(This activity works best in groups of 2)

Materials:

2 magnets (donut shaped or rectangular with hole in middle work best)
12-18 inches of fine string
Black and White adhesive Velcro
a compass, something metallic
3 x 5 index card (optional)
paper-clip (optional)

Assembly:

Attach the string to the magnet via the hole in the middle of the magnet.

To Do and Notice:

Try to forget you know anything about magnets and do NOT use the terms North (or South) until you hear the name Dinsdale Piranha.

Stand in an area that is not too close to metal tables or chairs. Hang the magnet by the thin string and watch what happens. When the magnet stops moving, **notice which direction(s) the 'flat' surfaces of the magnet is facing.** Move the magnet so that the flat surface is facing a different direction, then let go and watch what happens. If you do this in a larger group (10 -15 people), notice how many other magnets are facing in the same direction as your magnet, and how many are in the opposite direction.

More often than not, most of the magnets should be facing the same direction(s). Coincidence, or not...?

As a group, decide which landmark the magnets are facing and then stick the Velcro (the color will depend on the direction the group chooses) on the surface of the magnet that points to that landmark. Attach the other color to the opposite side/surface. We will now call the 2 faces of the magnet 'Black' and 'White'.

Using the compass, find out which direction/landmark is North.

[^] LIGO-SEC/ T. Huynh-Dinh 2014 (Modified 06-20-2018)

So What?:

Since the magnet has two large surfaces facing in the opposite directions, your group had a choice as to which surface to pay attention to (or define which way a magnet will point!). The Chinese chose the South pointing end and the Europeans chose the North pointing end. (Interestingly enough, the Chinese write from top right to bottom left, while Europeans write from top left to bottom right.)

Per the Amazing PD (Paul Doherty), the European cultures had already adopted the North Star as a navigational tool and saw the magnetic needle of a compass as a way to locate the North star when it was not visible.

What's Going On?

Each surface/end of your magnet is a magnetic pole. The pole that points towards the North was *originally* called the 'North-seeking pole'. Later that name was shortened to 'the North pole'.

Data table:

Working in groups of 2, fill in the table below by holding your magnet and with the *named surface* pointing towards your partner's magnet. For example, White Velcro to white Velcro, black Velcro to black Velcro, etc...

Slowly move them closer together and see/feel what happens. Complete the table below by doing all 9 possibilities.

	Black Velcro	White Velcro	Metallic material
Black Velcro			
White Velcro			
Metallic material			

From the completed table, notice that *Repulsion* is more revealing! Why you may ask...?!

Discuss this with your neighbors and see if they agree with that statement.

Questions, comments, and/or suggestions...? Please email: .. tien@ligo-la.caltech.edu