Make Your Own Compass – Student Activity

Earth's magnetism and its affect on rocks can help us understand continental plate movement

If free to move, magnetic material will always align North/South. Navigators used to find north by floating a magnetised needle on a piece of paper or parchment on a dish of water. As long as the paper remains dry the needle will respond to the lines of magnetic force generated from the Earth's core. North can also be found by using a compass, a map or street directory or an app.

Do you know any other ways of finding magnetic north? _____

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Temporary magnetism can be induced by stroking a metal object with a bar magnet

AIM To make a simple compass

MATERIALS per student or group

- A pin or safety pin
- A small piece of paper
- A beaker half full of water or Petri dish full of water
- A bar magnet
- Masking tape
- Thread

METHOD

1. Thread the pin through the paper.
2. Gently stroke the pin twenty times with the bar magnet. ***NOTE always stroke in the same direction.***
3. Let your needle and paper float and note the direction to which it points.
4. Turn the beaker through 90 degrees and note what happens.
5. Turn through a further 90 degrees.

RESULTS

First position	Turned through 90^0	Turned through 90^0

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What happened to the magnetised needle when the beaker of water was rotated?

_____

Explain why we had to push the needle through paper._____

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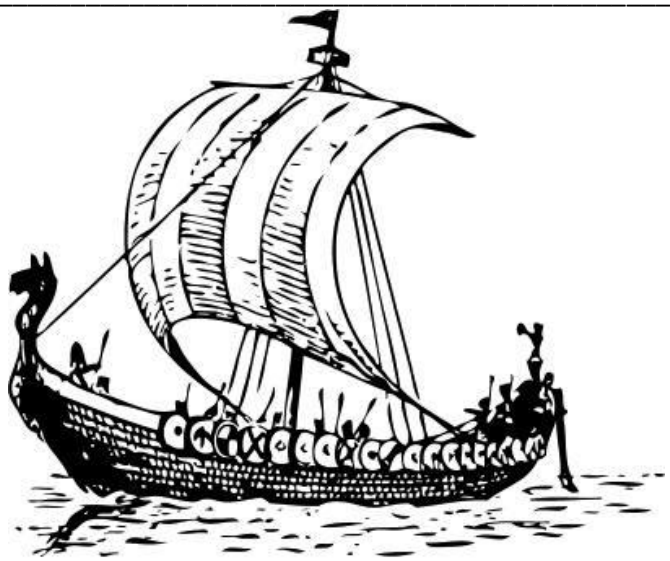

Early seafarers used this technique to find magnetic North and calculate their direction of travel their direction of travel. They used a magnetised piece of metal or a piece of the mineral magnetite. The device was called a lodestone (leading stone)

Extension

By measuring the orientation of minerals in some rocks we can locate the position of the poles at that time and whether they were north poles or south poles.

Our magnetic poles are not the same as our fixed geographic poles. Magnetic poles "wander in fixed paths. Interestingly out poles have "flipped" over hundreds of times in our geological past, most recently during the Stone Age about 780,000 years ago and there is some evidence we may be entering another reversal. The exchange of North and South poles takes between 1,000 and 10,000 years to occur. These events have been mapped and no relationship between them and catastrophic events such as extinctions has been noted. NASA has modelled the effect on our magnetosphere, which shields Earth from cosmic radiation, because any change in the magnetosphere would affect global communications. Interested students may wish to research "The Carrington Solar Storm". The Sun's magnetic poles flip every 9 to 12 years.

Information on possible side effects of pole exchange can be found at:
http://www.livescience.com/18426-earth-magnetic-poles-flip.html