10 The Earth as a magnet

The Earth behaves just as if it were a giant bar magnet.

Since ancient times, people have known that some black rocks had mysterious properties. These rocks could attract a piece of iron to them. Some people were afraid that if they sailed their ships too close to such black rocks then all of the iron nails would be pulled from the ships and they would sink.

(Picture 1) Some rocks, such as this one, are magnetic. This rock has been dipped in iron filings. The filings are not stuck on. They are simply held there by magnetism. This kind of rock is called lodestone.

Lodestone

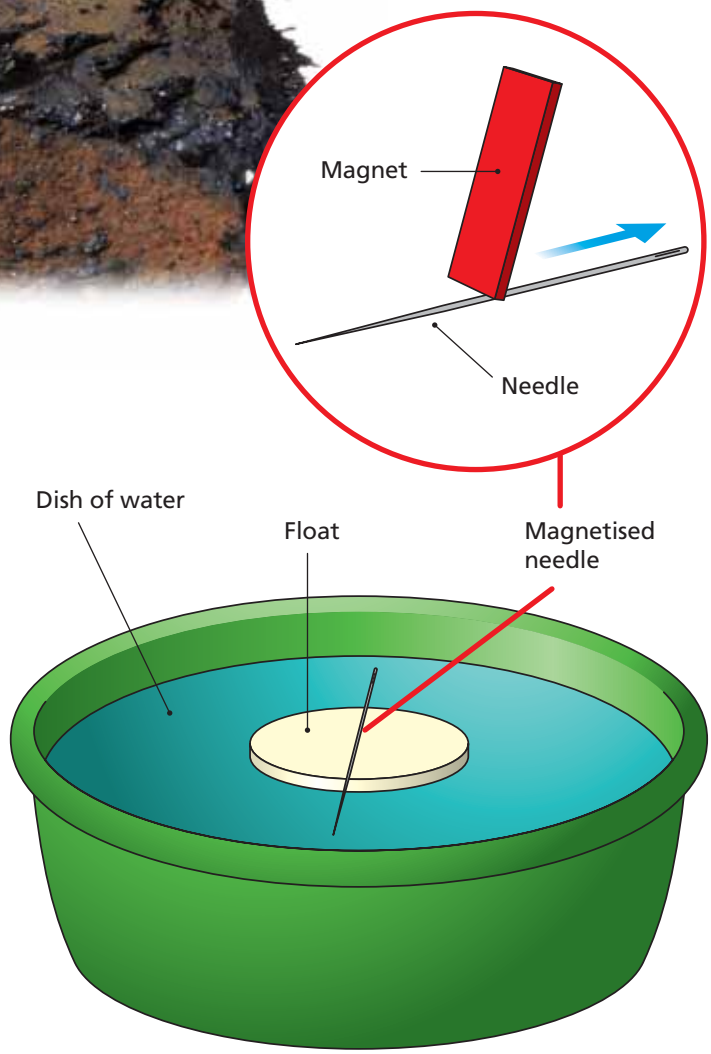
This was, of course, not true. But they did find out some useful things about this strange rock. For example, if a small sliver of the rock was hung from a piece of string, then they saw two things:

- The stone always turned until it faced one particular way.
- One particular end always pointed north.

They called this rock lodestone (Picture 1), meaning leading stone, because it would help lead them home.

Compass

People found that needles and other pieces of iron or steel that had been magnetised would work in the same way



(Picture 2) You can make a compass for yourself using a needle or thin nail, a piece of foam to act as a float and a dish of water. Magnetise the needle or nail as described on page 16, then put it onto the float and watch it turn. Use a shop-bought compass to check that it faces north.

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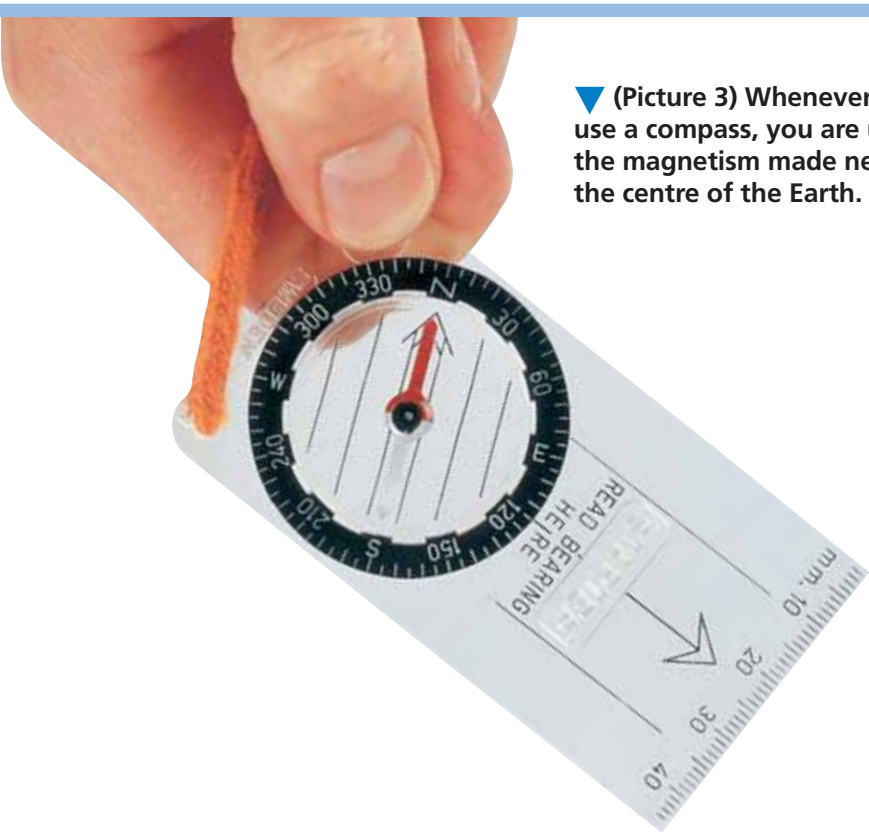
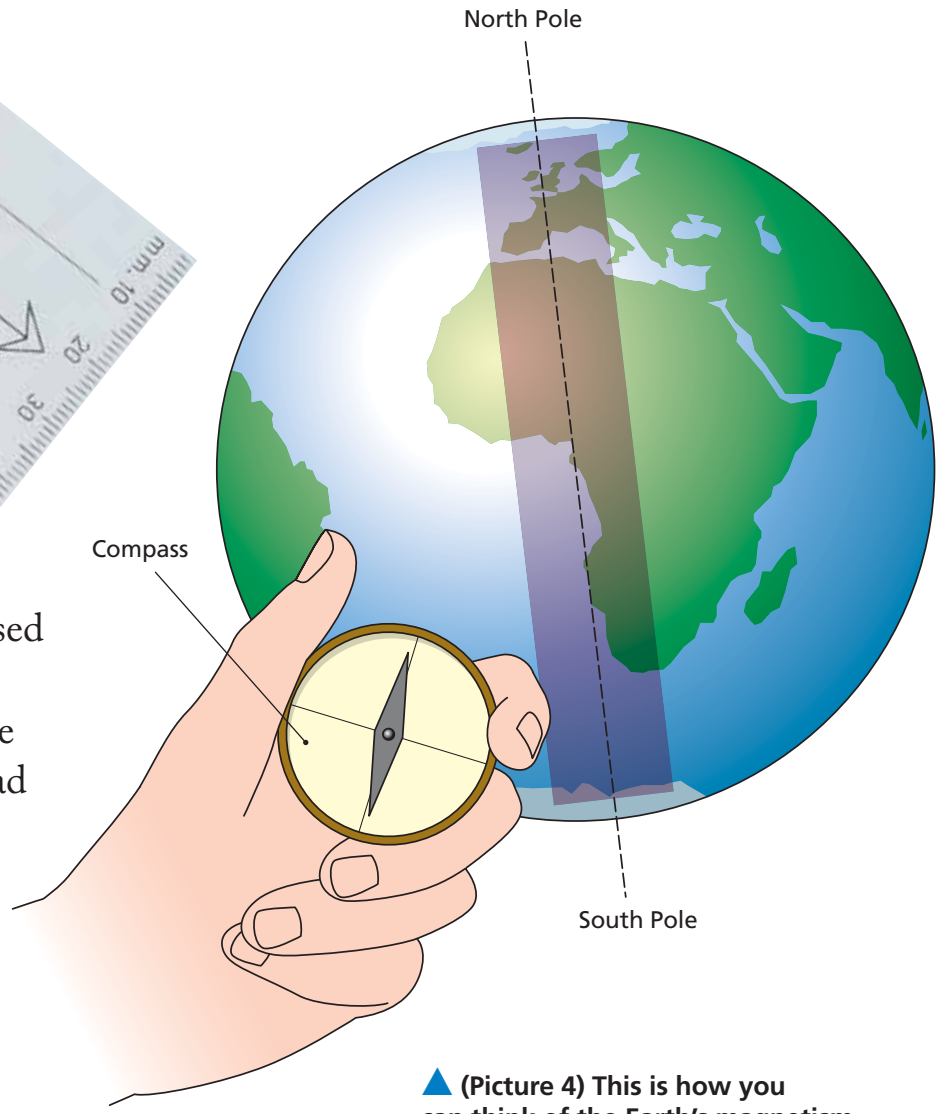


▼ **(Picture 3) Whenever you use a compass, you are using the magnetism made near the centre of the Earth.**

(Picture 2). If they put a magnetised needle on a piece of material and floated it on water then the needle would turn to face north. They had invented the **COMPASS**. Some modern compasses still float on water, but many simply turn in air (Picture 3).

The Earth

A compass only works because the magnetism in the compass needle is affected by magnetism in the Earth. Scientists have found that the centre of the Earth is made from iron, and this is what makes the Earth into a giant magnet. It works just as though there was a giant bar magnet inside (Picture 4).



▲ **(Picture 4) This is how you can think of the Earth's magnetism. However, there is no bar inside the Earth. All of the magnetism is at the ball-shaped centre of the Earth.**

Summary

- **The Earth is a giant magnet.**
- **A swinging magnet is called a compass.**
- **A compass is turned by the Earth's magnetism so that it always faces north.**

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