

MAKING A COMPASS

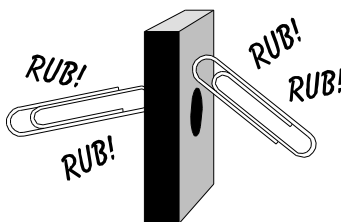
A COMPASS IS A MAGNET THAT CAN TURN
EASILY . . . LET'S MAKE ONE!



WHAT YOU NEED: a latch magnet, a bar magnet, a piece of cork, 2 paper clips, and a plastic cup with water. (and maybe a compass)

WHAT TO DO: Magnetize the needle like this.

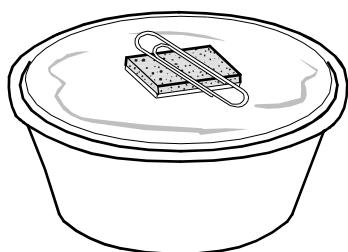
SCRATCH THE SMALL END OF A PAPER CLIP AGAINST ONE SIDE OF THE MAGNET.



SCRATCH THE BIG END OF THE *SAME* PAPER CLIP AGAINST THE OTHER SIDE.

Fill the plastic cup with water and float the cork on top.

SOAK THE CORK FIRST AND IT WON'T STICK TO THE SIDE OF THE CUP!



**Carefully put the paper clip on the cork.
There's your compass!**

Check to see if your floating needle compass really works. Move all magnets and steel away from it and watch which way it points. Which end of the floating needle points to Earth's North?

**Observe how your floating paper clip acts near your bar magnet.
Which end of the needle points to the bar magnet's N pole? _____**

**Bring another paper clip close to your floating compass without touching it,
and use it to drive your compass around in the cup!**

**Is it possible to reverse the magnetization of your floating compass?
Describe how:**

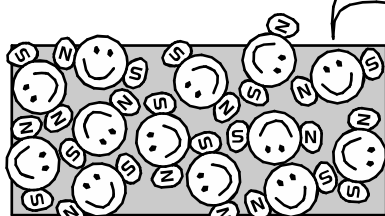
INTERESTING QUESTION:

**If the paper clip contains iron, and iron is magnetic, then why
do we have to rub the paper clip on the magnet to make it work?**

THESE FACES REPRESENT THE IRON ATOMS IN A PAPER CLIP. EACH IRON ATOM IS A MAGNET, BUT THE PAPER CLIP ISN'T A MAGNET BECAUSE THE IRON ATOMS CAN'T AGREE ON WHICH END OF THE PAPER CLIP TO MAKE NORTH.



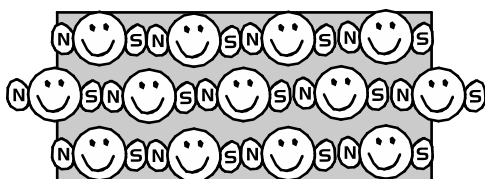
*IT'S NOT THAT WE'RE NOT MAGNETIZED.
IT'S JUST THAT WE DON'T KNOW WHICH
WAY TO POINT!*



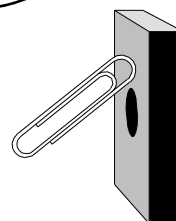
NEEDLE'S ATOMS

THE OUTSIDE MAGNET TELLS THE IRON ATOMS HOW TO LINE UP. ONCE THEY HAVE LINED UP THEY MAKE THEIR OWN MAGNET AND DON'T NEED AN OUTSIDE MAGNET TO TELL THEM WHAT TO DO.

*ALL IRON ATOMS!
SOUTH EARS THIS WAY!*



NEEDLE'S ATOMS



OUTSIDE MAGNET