Magnet Mania

NAME_____ PARTNERS _____

Whenever one body exerts a force on another through a distance, the concept of a field of force is used to describe the interaction. We use the concept of gravitational field to describe how a body is pulled toward Earth. We use the idea of an electric field to describe the way in which electrically charged bodies attract or repel one another.

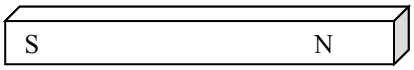
Effects of magnetic fields, unlike those of gravitational or electric fields, are rather easy to observe. You will use iron filings, a couple of magnets, and a compass to investigate this newest field concept.

PROCEDURES

(NOTE: Any sketches or responses are to be made in the RESULTS section of the write-up.)

1. **POLARITY CHECK.** Suspend a magnet from a string (away from an iron or steel object) to make sure the pole marked north in fact points to geographic north (some may not!).

2. **MAGNETIC FIELD LINES.** Place a bar magnet in the plastic tray, cover it with cardboard, and *lightly* sprinkle iron filings over the entire region. Tap the paper lightly and carefully sketch the resulting pattern.



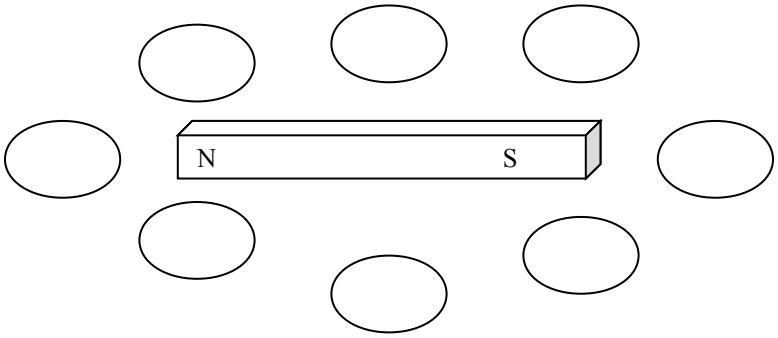
3. Place two magnets down with unlike poles approximately 1 inch apart and determine the magnetic field map with iron filings.

4. Now place like poles down and also determine the magnetic field between them.

5. **INDUCED MAGNETISM.** Test an iron for magnetism by touching it to something steel such as a thumbtack or paperclip. Test the nail again when attached to the end of a magnet. How many thumbtacks were you able to pick up?

How does the polarity of the **free end of the magnet** compare with the polarity of the **free end of the nail**?

6. **THE DIRECTION OF THE MAGNETIC FIELD.** Magnetic field lines run out of the north and into the south. Test this for yourself. Place a compass in each of the locations around the magnet shown and record the direction that each points.



ANALYSIS. Rewrite the following sentences correctly in your **conclusion.**

Magnetic field lines run out of _____ and into _____ -poles of magnets. Compasses show us the **B** nearby; typically that of the Earth. Oddly enough, the geographic north-pole of the Earth is a magnetic _____.

When a nail is attached to a magnet, magnetism is _____ (temporarily caused) within the magnet due to _____ (tiny cluster of atoms) becoming aligned within the nail. Three materials in which magnetism can be induced are _____, _____, and _____.

1. Near what points around a magnet is the magnetic field most concentrated?
2. Describe the magnetic fields between two like poles.
3. Describe the magnetic fields between two unlike poles.
4. Can you use a magnet to pick up aluminum cans? Why or why not?

ENRICHMENT:Do it well and earn a bonus!

Computer disks and cassette recorders have, for years, used magnetism as a means of recording information. Do some researching into this method and summarize your findings here.