

## Straw Magnets

Name \_\_\_\_\_ Per \_\_\_\_\_

**Your Goal:** is to make a model of a magnet, a “straw magnet,” using what are called iron filings (little shavings of iron) and a drinking straw. You will magnetize and demagnetize your magnet and then propose a theory to explain how these processes occur.

You may work in groups but everybody should get to make their own straw magnet to take home!

### Things you will need:

Soda straw

Iron filings

Low temperature hot glue gun

Bar magnet

Compass

Plastic weighing dish

Plastic pipet

Scissors

**Safety!** You will be using a hot glue gun with hot glue. **Please do not burn yourself!**

### Procedure

1. Plug one end of a straw (8-10 cm long) with hot glue (figure 1). Let it cool for a few minutes.
2. While the glue is cooling, make a small plastic funnel by snipping off the stem and top part of the bulb from a disposable pipet (share 1-2 between everyone at your table). The stem of the pipet should fit into the straw.
3. Add enough iron filings into a plastic weighing dish to fill the straw.
4. When the glue has cooled, use the plastic dish and the pipet funnel to **almost** fill the straw with iron filings (figure 2). Do this over a piece of paper you can put what you spill back into the dish. **Don't make a mess!**
5. Tap the straw gently and add iron filings if necessary. Allow enough room to have a tiny bit more space than you need to glue the end closed (figure 3).
6. Glue the second end closed with a plug of glue.
7. Magnetize your straw magnet by rubbing it with *one end* of the permanent magnet, rubbing in **one direction** (Figure 3). Fifteen to twenty times should be sufficient. Now **put the magnet far away**.
8. **Without disturbing the filings** inside the straw, **gently** lay it down in the middle of the space at the top of the next page.

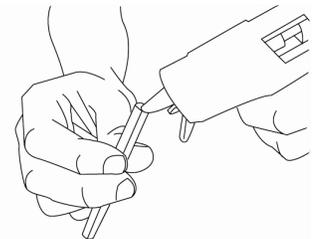


Figure 1



Figure 2

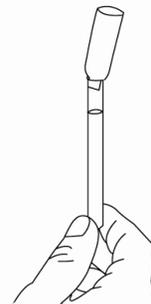


Figure 3

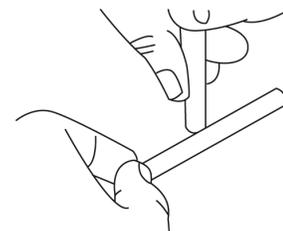


Figure 4

## Experiments in Magnetism Across Scale

9. Trace an outline of your straw in the space below and draw the magnetic field surrounding it. Label the North and South poles of your straw magnet.
  - a. Show the direction of the compass needle on each field line around the straw.
  - b. Label the North and South poles of your straw magnet.

10. Now, pick up the straw and shake it up. Place it in the space below and draw an outline. Now repeat steps 9 and 10 using the compass. Draw a sketch, as before, showing the positions of the compass needle around the straw magnet.



