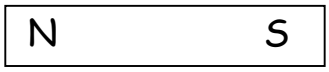
LAB: MAGNETIC FIELDS _____

The direction of a magnetic filed is the direction that a _____ pole would travel in the field. Therefore, field lines go from _____ to _____ outside the magnet.

1. Determine the magnetic field of the bar magnet according to the compass method. To do this method, place a bar magnet in the space on the below. Next, place a small compass beside one of the poles of the magnet. One end of the compass needle will point toward the magnet (side 1), the other will point away (side 2). Place a dot on your paper where side 2 points away from the magnet. Next, pick up your compass and re-place it on the paper so that the side 1 of the needle points toward the dot. Put a mark on your paper by side 2 of the needle. Repeat this process until the dots run off the page or back to the magnet. Connect the dots. Repeat this entire process starting at different places around the magnet until the entire _____ is drawn.

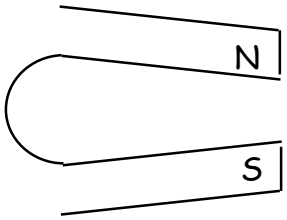
2. Determine the following magnetic fields using the iron filings method. To do this, place the bar magnet on the table and cover it with a piece of acetate (a transparency sheet for the overhead projector). Now, sprinkle iron filings on top of the sheet in order to determine the shape of the magnetic field. Each filing becomes a _____ magnet by the process of _____. Tap the sheet lightly, enabling the filings to spread out according to the strength of the field. Put a compass at various points around the magnet and notice how its direction compares with that of the iron filings. When you finish, draw a picture of the field showing at least 8 lines of flux, labeled appropriately. Return the filings to the shaker and repeat for the remaining pictures.

Case #1 - Bar Magnet



Case #2 - Horseshoe Magnet

Repeat above procedure. If the poles are not labeled, use another magnet or compass to determine the poles. Draw the magnet and the field to the right.



Case #3 – Two Unlike Poles

Line up two bar magnets in the holder so that N of one is beside S of the other, separating them by about 10 cm. Cover with the acetate and repeat as before.

Case #4 - Two Like Poles

Repeat above procedure placing two like poles together.