**Magnetic Field Lines**

Purpose: To map the magnetic field lines of permanent magnets.

Apparatus: Two magnets: bar & horseshoe, compass, sheets of white paper, card-board,
and iron-fillings.



Procedure:

1. Identify the north and south poles of the compass needle using Earth’s magnetic field.
2. Place a sheet of paper on the lab table, place a bar-magnet on it, trace the outlines of the magnet, and identify the poles (N and S) of the magnet.
3. Draw a dot somewhere near the magnet and place the head (or tail) of the compass needle over the dot.
4. Draw a dot at the location of the tail (or head) of the compass needle.
5. Move the compass needle head to this new dot, and again draw a dot at the location of the compass needle tail (or head).
6. Repeat steps 4-5 until the line meets the magnet or paper’s edge.
7. Remove the compass from the paper and draw lines connecting the dots with arrows indicating the direction that the compass points.
8. Pick another spot near the magnet and repeat the process (steps 3-7).
9. Repeat the above procedures for a horse-shoe magnet.
10. View how iron fillings line along the magnetic field by doing the following: Place the magnet on the table, place a card-board above the magnet, and place a sheet of paper on the card-board. Sprinkle iron-fillings on the paper, and tap the card-board gently.