

1 Overview

Due to quantum mechanical, atomic, and structural properties, some materials have permanent magnetic fields. For more information on why some materials are “magnetic” while others are not, watch this short (less than 10 minute) video: <http://youtu.be/hFAOXdXZ5TM>.

Compass needles are made of magnetic material; when able to rotate freely, the needle will align with a magnetic field.

With a bar magnet, the magnetic field lines are defined to be point from the “north” pole towards the “south.” Hold a compass near a bar magnet and observe what this means for compass needle.

2 Setup

Each group has a board that is covered in paper. Underneath the paper is a set of bar magnets; the magnets are arranged differently on different boards. Each board is labeled with a number; please note which board you used on your lab report.

3 Task

You will use a compass to map out the magnetic field on your board, and create a scale drawing on a piece of graph paper.

4 Questions

1. Describe your process for finding the magnets, including any challenges you faced and how they were overcome.
2. How many permanent bar magnets did you find?
3. How does one identify a region of strong field intensity? Where are these areas located with respect to the bar magnet?
4. Examine your map. Do the field lines ever intersect? Should they? Explain.

5 Grading

You will not write a full report. Turn in your scaled drawing, and answers to the questions.