

Matthew Vieira

Seeing the Magnetic Field

1, 40 minute class period

Goals:

- Understand the shape of a magnetic field created by a permanent magnet
- See how the strength of a magnetic field changes based on position

Objectives

- Draw a magnetic field
- Predict the behavior of a particle in a magnetic field and its speed relative to another particle somewhere else in the field

Materials

- Blank paper
- Bar magnets
- Compasses
- Iron Filings
- Shoe Box
- Mouthwash cups (2 oz.)

Prior Knowledge:

- Magnets and magnetic dipoles

NJCCCS:

5.1.8.B.3; 5.1.8.C.1; 5.1.8.C.2;

Procedure:

1. Begin discussion of magnetic fields
 - a. Students should be able to explain what happens in a magnetic field
 - b. Students should be asked to predict what the field looks like
2. Distribute blank paper, a bar magnet, and at least 2 compasses to groups of 4 students (mixed ability)
3. Placing the magnet in the center of the page, trace the magnet and identify the north and south poles
4. Now place a compass next to the magnet, draw an arrow following the direction of "north"
5. Repeat many times (at least 30) around the magnet and then at distances further from the poles. [15 min]
6. Collect the magnets and discuss what the different fields look like
7. Make sure that the student drawings have the arrows facing the correct way

- a. If not, explain why it is not entirely correct, but very close
8. Distribute shoe boxes and a cup of iron filings
9. With box facing up, place the magnet under the box in the center.
10. Sprinkle the filings all over the inside of the box and observe the magnetic field