

Main Topic	Magnetism
Subtopic	Magnetism
Learning Level	Elementary/Middle
Technology Level	Low
Activity Type	Student

Description: Inquiry lab in which students investigate the magnetic field around different shaped magnets.

Required Equipment	Bar magnet pair, Horseshoe magnet, other magnets, Magnetic Chips, Transparency sheets
Optional Equipment	Iron Filings, White paper

Educational Objectives

- Observe and describe the shape and strength of the magnetic field around different shaped magnets.

Concept Overview

Students will make observations of bar and horseshoe magnets, using iron filings or magnetic chips to map the field. The filings will be close together where the field is strong, and farther apart where it is weak. Lines will form, following the lines of the field, from the north pole to the south.

Lab Tips

Transparency sheets make it easy to see the physical shape of the magnet, but ordinary paper is a good substitute. Placing a pencil under each edge of the paper will keep it level, and keep the filings from sliding off.

If students use too much iron, they will have trouble distinguishing the lines. If they use too little, they may miss details of where the field is strong.

Students are asked about proper storage of magnets. When magnets are stored with like poles together, the magnetic fields oppose each other. The magnets are continually working to demagnetize each other, and over time, demagnetization does in fact occur. Likewise, iron objects that are not magnets can become magnetic when stored for a long time with a magnet.

This even occurs in the earth's magnetic field. Metal objects such as storage cabinets can develop magnetic properties when they are left in one place for several decades.

Magnetic Fields around Magnets

Name: _____

Class: _____

Goal:

Observe and describe the shape and strength of the magnetic field around different shaped magnets.

Materials:

Bar magnet pair, Horseshoe magnet, other magnets, Magnetic Chips,
Transparency sheets

Procedure:

1. Place a single bar magnet lengthwise under the transparency sheet. Use two pencils at the edges of the sheet to keep it from sagging. Sprinkle magnetic chips (or iron filings) evenly over the sheet. Shake lightly, like salt, until you see a pattern. Draw the pattern you see, and describe it in words.



2. Carefully lift the transparency sheet up and return the magnetic chips to the container. Repeat the experiment with the horseshoe magnet, draw the pattern, and describe it in words.
3. Remove the transparency and return the chips. Now use two bar magnets. Repeat the experiment three more times, using three different arrangements of the magnets together.

