

Magnetic Fields

MATERIALS

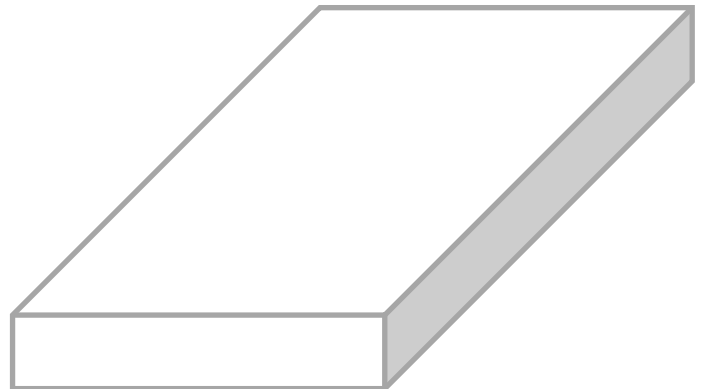
Bar magnet
Iron filings
Compasses
Various other magnets

MAGNETIC FIELD INTRODUCTION

The purpose of this activity is to investigate the area around a magnet known as the *magnetic field*. We will make observations about the shape of the field, and compare the fields of different magnets. The activities in this handout illustrate the ways in which investigations into magnetic fields can be differentiated and adapted across the K-12 science curriculum.

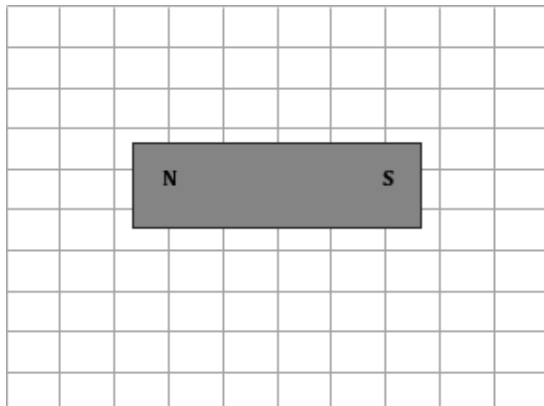
FIELD SHAPE WITH IRON FILINGS

Place a bar magnet on top of the case with iron filings. Sketch and describe what you see below. Make observations from the top and side views.



MAGNETIC FIELD DETECTORS

The direction of a magnetic field is taken to be the way that a compass would point if it were placed in the field. A compass is just a small magnet with an arrow marked on its north end. For each of the following configurations, place a small compass in each square and record the direction the needle points.



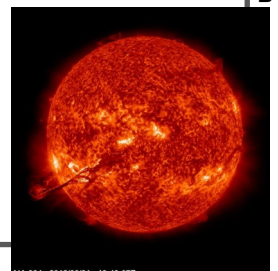
What pattern do you see?

Can you connect the arrows to form *magnetic field lines*?

Does this look the same as the iron filings?

If your magnet is not marked, is there a way to determine which end is the North pole and which is South?

A long, magnetic filament burst from the Sun



When describing magnetic fields, scientists agree that field lines come out of the north pole and enter the south pole. Add arrows to the sketches that you made to show the behavior of the iron filings.

For each of these configurations predict how the field lines will look. Record your predictions. Then use filings, compasses, or another magnetic field line detector to sketch the field lines.



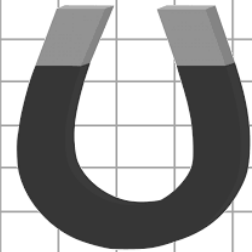
Prediction -



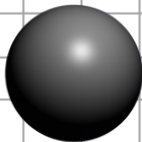
Prediction -



Prediction-



Horseshoe Magnet Prediction:



Magnetic Marble Prediction:



Neodymium Magnet Prediction: