

# Magnetic Field Strength

## MATERIALS

Iron filings  
Compasses  
Magnetic Field Probes  
Various Magnets (cow, bar, neodymium, horseshoe)

## MAGNETIC FIELD STRENGTH

Investigate the magnetic fields of the magnets we looked at in the previous activity. This time, we will be making a variety of measurements and observations to understand magnetic field strength.

## IRON FILING OBSERVATIONS

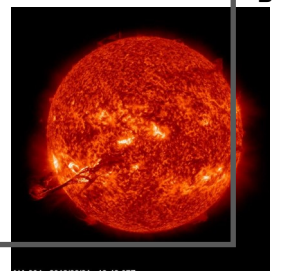
Place various magnets on top of an iron filing case and make observations about the field around each magnet. Where does the field appear to be strongest? How can you tell? Observe the iron filing patterns of several magnets. Can you determine which magnets are stronger?

## COMPASS OBSERVATIONS

Place small compasses around a magnet and make careful observations. How is each compass deflected? How do the differences in the compass deflections indicate differences in the strength of the magnetic field?

Compare the compass deflections for several magnets. How do the compass deflections indicate the differences in the magnets?

How can a compass be used to measure magnetic field strength? How is this data like the iron filing observations?



A long, magnetic filament burst from the Sun

### **PAPER CLIP OBSERVATIONS**

Pick up some paperclips using one of your magnets. Which part of the magnet is best for picking up paperclips?

How many paperclips can you pick up with each of your magnets?

Find the maximum distance at which each magnet can move a paperclip.

Organize and record your data below. What similarities or patterns do you observe?

### **VERNIER MAGNETIC FIELD PROBE OBSERVATIONS**

Use the Vernier Magnetic Field Probe to better understand the strength of magnetic fields. Investigate variables such as magnetic field strength and distance from pole, or magnetic field strength at set distances for different magnets. Organize and record your data below.