

MIGHTY MAGNETS

BENCHMARKS and TASK

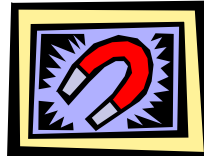
SC.C.1.1.2 The student knows that there is a relationship between force and motion.

SC.C.2.1.1 The student knows that one way to change how something is moving is to give it a push or a pull.

- The student determines that certain parts of a magnet are stronger than others.

KEY QUESTION

Which part of the magnet is the strongest?



BACKGROUND INFORMATION

Magnets usually have two poles – north-seeking and south-seeking. Like poles **repel** and unlike poles **attract** each other. Bar magnets have poles at each end. Horseshoe magnets are bar magnets that have been bent into that shape. The poles of ring magnets are on their flat sides. Magnets are strongest at their poles and weakest midway between them.

MATERIALS

Teacher

class chart or Tree Map

horseshoe magnet

The Mystery of Magnets (MacMillan Science Bks)

Magnets (Newbridge)

Per group

assortment of magnets (horseshoe, ring, bar, U-shaped, disc)

30 paper clips

1 sheet of acetate

small container of iron nuggets

shoebox lid or small tray

Mighty Magnets recording sheet

Per student

pencil

ENGAGE

1. Hold up a horseshoe magnet and ask:

What do you think will happen if I hold this magnet over some paper clips?

Allow time for students to share their predictions.

2. Ask:

Do you think that the magnet will hold the same number of paper clips all over or will more stick to some places on the magnet than to other places?

EXPLORE

1. Divide the class into groups. Give each group several different shaped magnets and about 30 paperclips in a shoebox lid or on a tray.
2. Ask each student to select a magnet and make a sketch of it on the data sheet.
3. Have students investigate which parts of their magnets are the strongest. Direct students to hang a paper clip on the magnet. Add paper clips, one at a time, to the first paper clip to make a chain until the magnet will no longer hold any more on the chain. Do this on different parts of the magnet and record on the *Mighty Magnets* recording sheet.

EXPLAIN

1. Ask:
Are there places on your magnet that attracted more paper clips than other places?
What places on your magnet held the most paper clips?
2. Have students tape their drawings on a class chart or Tree Map labeled with the name of the types of magnets used.
3. For each type of magnet ask:
Do you see a pattern that can help us determine where on the magnet the most paper clips were picked up?
Which part of a magnet is the strongest?
Did all magnets react in the same way?
4. Instruct students to take turns moving a paper clip along the length of the magnet.
Ask: *What did you notice as you moved the paper clip along the length of the magnet?*
5. Introduce the word “poles” at this time. Have students look at magnets in the classroom and note whether or not they are labeled with an *N* and an *S*. Explain that the *N* refers to the north pole and *S* refers to the south pole. Reinforce their observations about the strongest part of the bar magnet. Encourage them to use the word poles in describing that part.
6. Review *attract* as a pull and *repel* as a push.

EXTEND/APPLY

1. Distribute a bar magnet, a sheet of acetate, and a small container of nuggets to each group. Have students place the magnet under the sheet of acetate and sprinkle the nuggets on top. Allow time for students to observe and sketch the pattern created by the nuggets.
2. Ask:
Where on the magnet were most of the nuggets attracted?
What does this tell us about the strongest part of the magnet?
3. Read and discuss *The Mystery of Magnets* and *Magnets*.

EXTENSION

This is an appropriate time to label the four walls or corners (your compass will tell you where the label should be placed) of your classroom as North, South, East, or West. Use a compass to determine where “north” is and label with NORTH on a piece of cardstock. Continue with the other directions. Refer to them throughout the year.

ASSESSMENT

Have students draw or write in their journals where the strongest part of a magnet is located.

MIGHTY MAGNETS



Names _____

Trace each magnet.

Try to attach a paper clip chain to different parts of the magnet. Make Xs to show where you attached the paper clips.

Bar Magnet	Horseshoe Magnet	Ring Magnet