

MAGNET DETECTIVES

BENCHMARK and TASKS

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 classifies objects, including metals and nonmetals, according to their behavior with magnets.
- The student uses magnets to make some things move without being touched by the magnet.



KEY QUESTION

What will a magnet attract?

Can a magnet make some objects move without touching them?

BACKGROUND INFORMATION

There are three different kinds of magnets: natural, permanent, and temporary. **Natural magnets** are found in some rocks that contain a lot of iron. **Permanent magnets** are made out of steel (hard iron) or other magnetic alloys. They are strong and hold their magnetism for a long time. **Temporary magnets** are weak and last only a short time. An **electromagnet** is an example of a temporary magnet. All metals are not magnetic.

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.

Every magnet has a **magnetic field**, which interacts with the magnetic fields of objects containing iron or other magnetic materials. Magnetic fields can pass through both magnetic and nonmagnetic materials.

MATERIALS

Teacher

3 magnets
piece of clothing w/a pocket
scissors or 2 large paper clips
Magnets and Using Magnets
(Benchmark Education Co.)

Per group

container of small objects (chalk, pencil, crayon,
paper clip, matchbox car, button, key, brad,
marker, nail, bottle cap, eraser, etc.)
variety of magnets
We Think, We Know sorting sheet

TEACHING TIPS

1. Any object that is attracted to a magnet may be substituted for the scissors.
2. Place the small objects in a bag or a box lid for each group.

ENGAGE

Do either or both of the following engaging activities:

1. Wear a piece of clothing with a pocket.
Hide a magnet in the pocket.
Casually bring a pair of scissors or two large paper clips to the outside of the pocket.
Remove your hand and let the scissors/clips remain stuck to your clothing.
Some students may say you have a magnet in your pocket.

2. Before students arrive, place two magnets on the overhead projector.
Turn on the overhead projector.
Place the magnets so they repel each other.
Bring one toward the other, and let the students see the second one *scoot* away from the other.
Then turn the magnets so they attract.
When one jumps toward the other, the class will probably identify the objects as magnets.

EXPLORE Part 1

1. Place students in groups and distribute the bags/containers of small objects and the *We Think and We Know* worksheet to each group.
2. Have students remove one item at a time from the container and predict whether or not the item will “stick” to the magnet.
3. The item should then be placed in the appropriate box on the *We Think* part of the sorting sheet.
4. After all items have been placed in the appropriate *We Think* boxes, distribute the magnets.
5. The students should test the items one at a time and then place each object in the appropriate *We Know* box.

EXPLAIN

Have the groups examine their *yes* and *no* collections.

Ask:

How are the objects in the “yes” box alike?

How are the objects in the “no” box alike?

What will a magnet attract?

EXPLORE Part 2

1. Have students place a magnet above each object without allowing the magnet to touch the object. Gradually lower the magnet until the object moves without being touched.
2. Have students use different kinds of magnets to try and move the objects.

EXPLAIN

Discuss observations.

Ask:

What happened?

Did all the objects move?

Did they move the same way when you used different magnets?

Was any work done?

How do we know work was done?

EXTEND/APPLY

1. Discuss how magnets are used in everyday life (magnets at junk yards to pick up cars, magnets to pick up pins, magnets on cabinet doors, paper clip holders, etc.).
2. Ask: *Have you ever seen someone at the beach with a metal detector trying to find any jewelry or money that has been lost in the sand?*
What do you think may be inside the metal detector?
3. Have the students bring objects from home that they would like to explore with the magnets. Set up a center with various magnets so the students may check the objects.
4. Read *Magnets* and *Using Magnets*.

ASSESSMENT

Display some items that they have not had an opportunity to observe. Thinking about what they now know about objects that stick to magnets, have them predict which of the new items would go in the yes and no boxes. Ask them to give reasons for each of their predictions.



WE THINK

YES

NO

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WE KNOW

YES

NO

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