

GLE 0107.12.1 Investigate materials that are attracted to magnets.

- ✓ *0107.12.1 Identify and classify objects in the classroom as magnetic or non-magnetic.*
- ✓ *0107.12.2 Make predictions about how various objects will be affected by a magnet.*

MAGNIFICENT MAGNETS

A. Lesson One: MAGNETIC HUNT

1. Objectives/Goals
 - To illustrate that magnets produce an invisible force, and that some things respond to magnetic force or pull, others do not
2. Materials
 - chart paper and markers, 10 to 15 horseshoe magnets, science journals
3. Prior Knowledge for Students
 - None
4. Key Vocabulary
 - Magnet, magnetic, force
5. Procedures/Activities
 1. Introduce the unit of study. Display chart paper with the heading, "What we already know about magnets." (KWL chart found at end of lesson.) As students offer responses, record them on the chart. Do not correct the students' inaccurate responses. This will be helpful in ascertaining the students' prior knowledge, including accurate and inaccurate assumptions. This chart can be referred throughout the unit of study as a way for students to reflect upon their learning and to rethink inaccurate ideas.

2. The study of magnets begins with an open exploration of magnetic and non-magnetic objects. Provide each pair of students with a horseshoe magnet. Have the students work with a partner to go on a "magnetic hunt." They explore the room, predicting what objects are magnetic and what objects are not magnetic. As they test their hypotheses, they record their findings in their science journals (or sheet of paper if students do not have journals). ****IMPORTANT:** It might be a good idea to tell students which objects they should not test with magnets, i.e. computer screens, computer disks, audio cassette tapes, etc.
3. Have students come back together to share their findings. Discuss any objects the students found in common. Allow students to share any other observations or things they noticed in experimenting with the magnets.
4. Evaluation/Assessment: Teacher evaluates student responses and science journals.

B. Lesson Two: WHAT CAN A MAGNET ATTRACT?

1. Objectives/Goals
 - a. To illustrate that magnets produce an invisible force and that some things respond to magnetic force or pull; others do not
 - b. To classify objects and formulate hypotheses regarding materials and their magnetic properties
2. Materials for each cooperative group
 - a. A bag of objects containing: a pencil, eraser, paper clip, butter knife, keys, coins, piece of cloth, piece of paper, small comb or other plastic object, nail, an aluminum can, tin can, marble (any classroom objects may be used in place of or in addition to these; there are blanks left for modification)
 - b. A bar magnet
 - c. Prediction Chart (found at the end of the lesson)
 - d. For each student: science journal
3. Prior Knowledge for Students

- a. Magnetic, hypothesis, conclusion
- 4. Key Vocabulary
 - a. Magnetic, hypotheses, conclusion
- 5. Procedures/Activities
 - a. Pass out bags of materials to each group. As a class, ask students to predict which objects will be attracted to the magnet. Record their predictions on the chart paper. From these predictions, ask the students to formulate a hypothesis i.e. "Metal objects are attracted to magnets." Also record the hypothesis on the chart paper so that it may be referred to at the end of the lesson.
 - b. Each group experiments with the objects in the bag to determine if they are magnetic or not. As each item is tested, students sort the objects into two groups by marking them on their own Prediction Chart.
 - c. As each object is classified, the students record the results. The students then record what material the object is made of (wood, plastic, metal, glass, etc).
 - d. After the groups have completed the activity, bring the class together for discussion: Were more objects magnetic or non-magnetic? Were there any objects that surprised you? Why? Do you see anything in common among the objects that are magnetic? Were all the metal objects magnetic? Was our hypothesis correct? What conclusions can we draw from our observations?
 - e. Following discussion, have the students write about the conclusions they can make from their observations.
- 6. Evaluation/Assessment
 - a. Teacher evaluates student responses and science journals.

C. Lesson Three: MAGNETIC FORCE FIELD

- 1. Objective/Goals
 - a. To illustrate: magnetic pull is greatest when the object is closest to the magnet; magnetic power passes through objects it attracts, however the magnetic force

decreases with distance; a magnetic force can hold a limited amount of weight.

2. Materials

- a. For each pair of students: a horseshoe magnet, straight pins, steel ball bearings, paper clips, hairpins, staples
- b. For each student: Science journal

3. Prior Knowledge for Students

- a. Lessons One and Two

4. Key Vocabulary

- a. Magnetic force field

5. Procedures/Activities

- a. Introduce the lesson by asking students to consider how far magnetic force reaches, and introduce the vocabulary, "force field." Model the procedure for the lesson. Ask students to predict which items the magnet will be able to hold the most (straight pins, ball bearings, paper clips, hairpins, or staples). Ask students to explain their hypotheses for their predictions (explain why they made that prediction). Have students record their own hypothesis in their science journal.
- b. Each pair of students works together to explore the strength of the horseshoe magnet by picking up a straight pin with the end of the magnet. They add another pin to the first, then another and another. They keep adding pins in a dangling string from the magnet until the last one no longer sticks. How many pins could the horseshoe magnet hold? They record their findings in their science journals.
- c. The students repeat the procedure with each of the objects, recording their findings.
- d. When students have completed their experimentation, bring the class together to discuss their findings: Which object did the magnet hold the most? The least? Were our predictions correct? Were our hypotheses correct? Did everyone get the same answers? Why did the magnet hold more (staples) than (ball bearings)? What conclusions can we make?

- e. Have students write their conclusions in their science journals.
- 6. Evaluation/Assessment
 - a. Teacher evaluates student responses and science journals.

D. Lesson Eleven: HOW DO WE USE MAGNETS EVERY DAY?

- 1. Objectives/Goals
 - a. To expose students to the roles magnets play in our everyday life.
- 2. Materials
 - a. Journal, pencil, chart paper, objects (or pictures of objects) that utilize magnetism: refrigerator magnets, can opener, computer diskettes, cassette recorder and tape, speakers, VCR and VCR tape, clothes dryer, refrigerator, etc.
- 3. Prior Knowledge
 - a. Information gained in Lessons One Through Three
- 4. Key Vocabulary
 - a. Prior vocabulary
- 5. Procedures/Activities
 - a. Students gather together in a group. Teacher begins discussion. We have learned a lot about magnetism. What can you tell me that you have learned? Teacher writes on a chart paper headed with "What we have learned about magnets." This paper should be posted next to chart paper completed in Lesson One. After completing, discuss with students the similarities and differences of their responses then and now. Why have some theories changed? Allow students to lead the discussion and question each other.
 - b. Ask students, now knowing what magnets are and what they attract, to brainstorm (on chart paper) ways we use magnets every day. Allow all thoughts to be put on paper.
 - c. Now show students items or pictures (can opener, diskettes, etc.). As you display each item, ask students

to predict whether or not that item utilizes magnetism to work.

- d. After all items have been displayed, point out that all these objects use magnetism in one way or another.
- e. Students write and draw in journals, Appendix K, explaining ways in which magnets are used every day.
- f. Students are directed to take home journals and find at least two more ways they use magnets at home.

6. Evaluation/Assessment

- a. Teacher will assess student's understanding based on contributions to class discussions and journal entries.

I. OTHER SUGGESTED ACTIVITIES AND RESOURCES

A. Centers

- B. Website- <http://kids.aol.com/homework-help/junior/science/magnets>; make sure to check out the video and the DragMag game!

Magnificent Magnets

KWL

What do you know?	What do you want to know?	What do you want to learn?

