

MAGNETS:

A Hands-On Science Unit



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MAGNETS: A Hands-On Science Unit

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This magnet unit was created with first grade in mind, but it could be used in other primary grades. The lessons are hands-on, encourage cooperative learning, and reference Indiana state standards.

Lesson 1 - To Stick or Not to Stick 3

Students use magnets to experiment with metal and nonmetal objects and record data.

Lesson 2 - Amazing Magnets 5

Students use magnets to navigate objects through obstacle courses and around designs.

Lesson 3 - Mighty Magnets I 14

Students will investigate the varying strength of magnets and record data.

Lesson 4 - Mighty Magnets II 16

Students explain observations from Mighty Magnets I by using the data to create picture graphs.

Lesson 5 - Magnetic Attractions 19

Students will make predictions about whether a magnet will go through each of the barriers, then observe and collect data.

Lesson 6 - Magnet Magic 22

Students use magnets to separate mixtures of metal and nonmetals, and record observations.

Lesson 7 - Magnet Showtime 25

Students create a story and present it to others by manipulating the characters with magnets.

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Lesson 1 - To Stick or Not to Stick

Objectives:

- Students will observe, describe, and draw different objects.
- Students will determine and classify objects as either metals or nonmetals using magnets.

Materials:

- For each pair of students
 - bar magnet
 - donut or ring magnet
 - horseshoe magnet
 - student data sheet
- Plastic bag containing magnetic and nonmagnetic objects
 - twist-tie (plastic-coated wire)
 - marble
 - Popsicle stick
 - metal paper clip
 - plastic-coated paper clip
 - penny
 - cotton ball
 - piece of drinking straw
 - rubber band
 - plastic bottle cap
 - bolt
 - toothpick
 - washer
 - pop tab

Remind students to show concern, respect, and responsibility for equipment and others while experimenting in science. Demonstrate the importance of respecting all ideas and opinions, and treating others as they would wish to be treated.

Indiana State Standards

Science 1.1.1, 1.1.2, 1.1.4, 1.2.7
Social Studies 1.5.3, 1.5.4
Language Arts 1.6.1

Procedure:

1. Display the three different types of magnets. Ask students to identify them and their uses.
2. Identify them as a bar, donut, and horseshoe magnets.
3. Distribute bags containing the miscellaneous objects to each pair of students.
4. Instruct students to choose four objects from their bag and to make a drawing of each object in the first row of the data table. The objects may be taken out of the bag.
5. Once the drawings have been checked by the teacher, the student may have the bar magnet.
6. Experiment and record whether each of the objects attract or don't attract to the magnet. Write **yes** if it attracts and **no** if it does not attract in the second row of the data table.
7. Instruct students to record in the third row of the data table what each object is made of: wood, plastic, metal, cement, cotton, etc. and record in the data table.
8. If any group is working quietly or finishes early, encourage them to test something in the room with their magnets, excluding computers, and record it on the back of their data tables.
9. Gather for whole group instruction.
10. Elicit from students what they know about magnets.
11. Ask students to share some of their findings about the magnets with the class.
12. If there are discrepancies with some of the items attracting or not attracting to magnets, re-test the items and discuss the ideas of multiple trials in science.
13. Ask students to explain why their magnets stick to some metals but not others. (The reason some metals attract and others do not is because of the arrangement of their atoms. It is not necessary to share this information with the students. Let them discover that the metals must be somehow different. Magnets attract to only three types of metals: cobalt, nickel and iron.)
14. Conclude the lesson by asking children if they have any questions about magnets they would like to investigate. Write these down on the board or large piece of paper.

Magnet	Objects			
Bar	Object 1	Object 2	Object 3	Object 4
Draw object				
Did it attract? Yes or No				
What is it made of?				
Donut	Object 1	Object 2	Object 3	Object 4
Name or Draw				
Did it attract? Yes or No				
What is it made of?				
Horseshoe	Object 1	Object 2	Object 3	Object 4
Draw				
Did it attract? Yes or No				
What is it made of?				