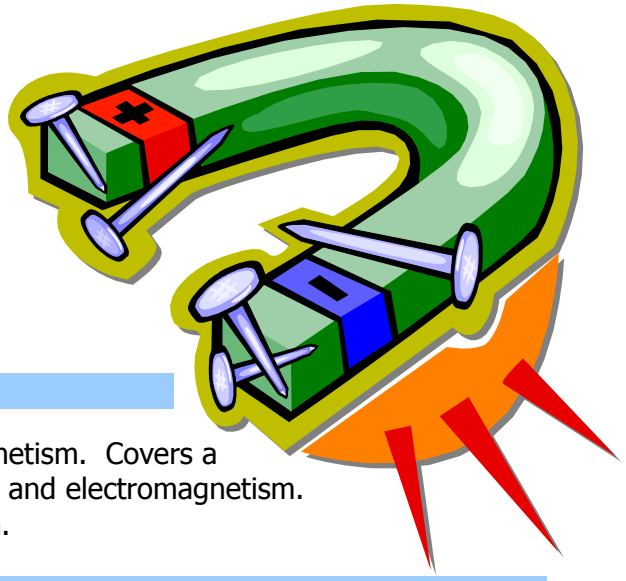
#9291
MAGNETISM

AIMS MULTIMEDIA
2001
Grade Levels: 5-10
18 minutes
1 Instructional Graphic Enclosed



DESCRIPTION

Presents general information about magnets and magnetism. Covers a brief history, the principles of attraction and repulsion, and electromagnetism. Simple experiments clarify the principles of magnetism.

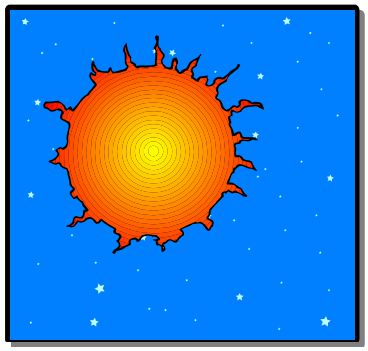
ACADEMIC STANDARDS

Subject Area: Science: Physic al Sciences

- Standard: Understands forces and motion
  - Benchmark: Knows that magnetic forces are very closely related to electric forces and can be thought of as different aspects of a single electromagnetic force (moving electric charges produce magnetic forces and moving magnets produce electric forces); the interplay of these forces is the basis for electric motors, generators, radio, television, and many other modern technologies

INSTRUCTIONAL GOALS

1. To study our discovery and understanding of magnetism.
2. To explore how magnets can be used in many ways.
3. To learn about the attracting and repelling properties of magnets.
4. To understand how the Earth is like a magnet.
5. To identify magnetic materials.
6. To learn how to create simple magnets.
7. To better understand electromagnetism.



VOCABULARY

1. attract
2. compass
3. electromagnetism
4. horseshoe
5. magnetic field
6. magnetite
7. poles
8. repel
9. solenoid
10. sunspots

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BEFORE SHOWING

1. What do you know about magnets?
2. What does a *simple magnet* do?
3. What kinds of materials does it attract?
4. Does a magnet attract more material to its middle or to its ends?
5. Two things can happen when magnets are placed near each other. What are they?

AFTER SHOWING

Applications and Activities

1. Review and discuss the questions in BEFORE SHOWING.
2. Ask students to use a magnet to test the magnetic properties of the items listed below. When they are finished, ask them to look closely at the objects that were attracted by the magnet. What do they have in common? Do they have similar weights, colors or forms? Of what are they made?
   a. sewing needle
   b. pencil
   c. eraser
   d. plastic comb
   e. copper wire
   f. paper
   g. thumbtack
   h. paper clip
   i. rubber ball
   j. cloth
   k. toothpick
3. An audiotape works because of magnets, but magnets can also ruin audiotapes if they get too close to them. Why might a magnet ruin the sounds recorded onto an audiotape?
4. A compass uses a small magnetized needle to help us find directions. What might happen if a powerful magnet got too close to a compass?
5. Magnets are invisible, but we can see their forces by using iron filings. Allow the class to work with iron filings and two small bar magnets. First, have them place the bar magnets with like poles facing each other. Next, the students should place a sheet of paper over the bar magnets and sprinkle iron filings on the sheet. What happens?
   a. Have them repeat the experiment by placing the magnets with opposite poles facing each other. What happens to the filings now?
   b. What could be the explanation?
6. The strength of a magnetic field is measured in units called "gauss." The Earth's magnetic field is about ½ gauss. Ask students to find out for who the gauss is named. What was this person's contribution to the study of magnetism?
7. Many scientists contributed to our understanding of magnetism and electromagnetism. Ask students to investigate the contributions of each scientist listed below. Encourage them to summarize the main discovery or invention of each scientist in a few sentences.
   a. Thales of Miletus
   b. William Gilbert
   c. Hans Christian Oersted
   d. Andre Marie Ampere
   e. William Sturgeon
8. Scientists believe that magnetite, the mineral that the Ancient Greeks discovered to be magnetic, was formed deep in the Earth. Ask students if they can guess why the magnetite

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gained magnetic properties. Tell them to keep two things in mind: The Earth's natural magnetic field and the presence in all magnets of atoms lined up in the same direction.

9. Ask students to go through their homes making a list of the things that use magnets. When they are finished, ask them to choose o ne of the items on the list. Have them write a paragraph describing what life would be like without the item. How would their lives be more difficult? Encourage class members to share their paragraphs with one another.
10. Complete the vocabulary puzzle worksheet. (See INSTRUCTIONAL GRAPHICS.)

RELATED RESOURCES

Captioned Media Program

- Energy: Working for Us #2606
- Magnets! Magnets! #2198

World Wide Web

The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and "kid safe" sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **THE HISTORY OF ELECTRICAL ENGINEERING**

http://library.thinkquest.org/27826/htmldocs/english/tb.htm

Briefly describes a short biography of contributors to electricity, magnetism, and other forces. Includes Ampere, Gilbert, and other scientists.

- **CIRCLES OF MAGNETISM I**

http://www.exploratorium.edu/snacks/circles_magnetism_I.html

You can make a magnetic field that's stronger than the Earth's! Find out how here. Simple materials are needed then follow the directions.

- **LET'S THINK ABOUT…MAGNETS AND GRAVITY**

http://pbskids.org/jayjay/care.curr.cl.17.html

Based on the PBS show, "JayJay the Jet Plane," explains what are magnets and gravity, what they do, how science and inventors use them, and other brief information.

INSTRUCTIONAL GRAPHICS

- VOCABULARY PUZZLES

Vocabulary Puzzles

Name _____

MAGNETISM PUZZLE

M_____	The force created by a magnet is known as a ___ field.
A_____	Spinning electrons make each ___ like a tiny magnet.
G_____	The ancient ___ discovered the first natural magnets.
N_____	A compass needle always points to the ___ pole.
E_____	___ can be used to create a magnet using electricity.
T_____	A ___ magnet gains and loses magnetism very easily.
I_____	Materials containing ___ have strong magnetic properties.
S_____	A ___ is created with a coiled wire and electricity.
M_____	A permanent ___ keeps its magnetism for a long time.

NUMBER CODE

A = 1	**F = 6**	**K = 10**	**O = 14**	**T = 18**
B = 2	**G = 7**	**L = 11**	**P = 15**	**U = 19**
C = 3	**H = 8**	**M = 12**	**R = 16**	**V = 20**
D = 4	**I = 9**	**N = 13**	**S = 17**	**W = 21**
E = 5				

1. 4-9-17-10 magnets are used in the speakers of radios and televisions.

_____

2. A permanent magnet is usually made from 8-1-16-4 metals, like iron and steel.

_____

3. Small 8-14-16-17-5-17-8-14-5 magnets are used in radar machines.

_____

4. During the Middle Ages, people thought that magnets had 12-1-7-9-3-1-11 powers.

_____

5. Magnets are used to keep cabinets and refrigerator doors 3-11-14-17-5-4.

_____

6. The 3-14-12-15-1-17-17 made it possible for navigators to explore unknown worlds.

_____

7. Even the most powerful magnetic field is 9-13-20-9-17-9-2-11-5 to the human eye.

_____

8. There are two types of magnets: 13-1-18-19-16-1-11 magnets, like lodestone, and 1-16-18-9-6-9-3-9-1-11 magnets, which are made by people.

_____ and _____

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