Name _____

MAGNETISM

Pre-Test

A. Directions: Circle the word or phrase that completes the sentence.

1. If two bar magnets are brought near each other and they repel, then
   - **the poles of the magnets are the same.**
   - **the poles are opposites.**
   - **nothing.**
2. If two bar magnets are brought near each other and they attract each other, then
   - **the poles of the magnets are the same.**
   - **the poles are opposite.**
   - **nothing.**
3. A natural magnet comes from a rock called
   - **iron.**
   - **magnetite.**
   - **steel.**
4. - **Atoms**
   - **Molecules**
   - **Electricity**

   _____ and magnetism are related.
5. The ends of a bar magnet are called
   - **poles.**
   - **circuits.**
   - **attract.**

B. Directions: Answer the following questions with a short answer. You may use the back of this sheet if you need more space.

1. What can electromagnets do that can't be done by permanent magnets?

2. Describe some ways electromagnets are used.

3. Tell whether the following bar magnets would attract or repel by circling either attract or repel.

Attract or Repel

Attract or Repel

Name _____

MAGNETISM

Video Quiz

Directions: At the end of the program there is a quick quiz. You can answer the questions on this sheet.

1. If unlike sides of two magnets are brought close to each other what will they do?
   a. push away from each other
   b. spin around
   c. pull towards each other
   d. nothing

2. True or False: A magnet can be made by rubbing a piece of steel or iron with a permanent magnet.

3. A magnet that can be turned on and off is called a _____.
   a. lodestone
   b. magnetite
   c. electromagnet
   d. permanent magnet

4. Who were the first people to use magnets for traveling on the oceans?
   a. Italians
   b. Chinese
   c. French
   d. English

5. Michael Faraday proved that magnetism could be used to make _____.
   a. electricity
   b. power
   c. light
   d. electromagnetism

Name _____

MAGNETISM

Word Search

Directions: There are nine words scattered throughout this puzzle. They are listed below. See how many you can find. They may be written diagonally, horizontally, or vertically.

M L D I M W T W E N E W
I H I A E Z O T Z J N H
Z Q O R C O I L C Q E P
U Q R F O T U A Y C M Q
T D N G E N E R A T O R
B O E N L V R P V C Z T
G M G W E A R H O Y V X
F A K S C O I R D V M K
M I K F T F G Y W H F G
A N R O R E B H O P B Z
G S M A O O E D H H N T
N L J S M X P L H V M K
E G Q B A M O X L J Z J
T T T W G G J A E F Y J
I A R O N H O V U X C C
S Q I R E T N D S X C C
M C O P T R R D E S L M

Here are the words to look for:

MAGNETISM	IRON	GENERATOR	MOTOR
ELECTROMAGNET	STEEL	MAGNETITE	DOMAINS
COIL			

Name _____

MAGNETISM

Fill-In

Directions: Use the words at the bottom of the page to fill in the blank spaces in the following sentences from the program.

Over 2,000 years ago the _____ discovered a special stone that could pick up small bits of iron. The stone was called a _____ and was made of _____. It is possible to make a magnet if we rub a permanent magnet across either _____ or _____ nails.

It was found that an electric _____ flowing through a wire would make magnetic effects. An _____ is made by coiling an electric wire around an iron nail. The mag netism can be controlled by turning the electricity on and off. A _____ is used to make electricity by spinning coiled wire in a magnetic field.

Fill-In Words:

STEEL	GREEKS	IRON	MAGNETITE
GENERATOR	CURRENT	HEATED	COOLED
DROPPED	LODESTONE	ELECTROMAGNET	

Name _____

MAGNETISM

What Do Magnets Attract?

Purpose: To test different objects to see if they are attracted by magnets or not. Before you test an item be sure to make a guess as to whether you think the item will be attracted to the magnet. Write your guess in the observation section.

Materials: 1. Magnet
2. objects to test (such as spoons, coins, feathers, marbles)

Procedure:

1. Test each item by bringing the magnet close to it. Watch for any movement by the object.
2. Touch the magnet to the object and slowly pull the magnet away.
3. Write down what you discover in the chart below.

Observations: Fill-in the chart below with your guesses and test results.

Object Tested	What is your guess?		Did the magnet attract it?	
	Attract	No	Yes	No
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				

Name _____

MAGNETISM

Can Magnetism Go Through Objects?

Purpose: To see if magnets can work through objects.

Materials:

1. bar magnet
2. paper clip
3. drinking glass (made of glass)
4. wooden ruler
5. plastic ruler
6. cardboard
7. book cover
8. water

Procedures:

1. Put the paper clip in the drinking glass.
2. Bring the magnet next to the glass and see if it will attract the paper clip. Move the magnet up the side of the glass to see if the paper clip will also be pulled along.
3. Try the same thing with water in the glass.
4. Test the magnet with wood. Put the paper clip on one side of the wooden ruler and the magnet on the other.
5. Test other objects to see if magnetism can go through the object.

Observations: Make a list of materials magnetism can go through and still attract the paper clip.

Name _____

MAGNETISM

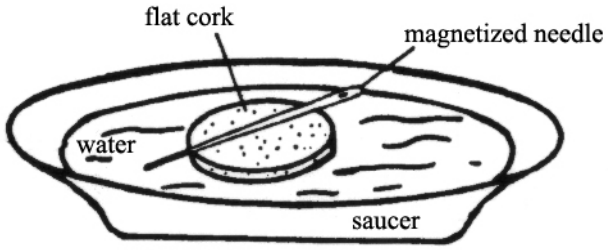
Compass Construction

Directions: Do the following experiment to build your own compass.

Purpose: To construct a compass.

Materials:

1. bar magnet
2. sewing needle
3. flat cork
4. saucer of water
5. tape



Procedures:

1. Turn the sewing needle into a magnet by stroking it across a bar magnet. Stroke it in only one direction and on only one pole of the magnet. At the end of a stroke, lift the needle off of the magnet and bring it back to the starting point. Stroke the needle across the magnet at least 40 times.
2. Tape the magnetized needle to one of the flat sides of the cork.
3. Pour water into the saucer.
4. Float the cork in the water with the needle on top.
5. Give the cork a spin and make observations. Repeat.

Observations:

1. What happened when you first placed the cork and needle in the saucer of water?

2. What happened when you spun the cork and needle?

Conclusion: Why did the needle and cork behave as they did?

Name _____

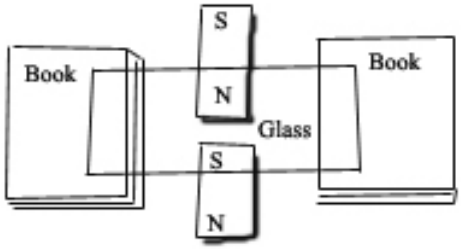
MAGNETISM

Lines of Force

Purpose: To see the lines of magnetic force that exist in a magnetic field.

Materials:

1. two bar magnets marked with N for north and S and south poles
2. a piece of glass, plastic, or poster board (at least 6" by 6")
3. iron filings
4. two identical books

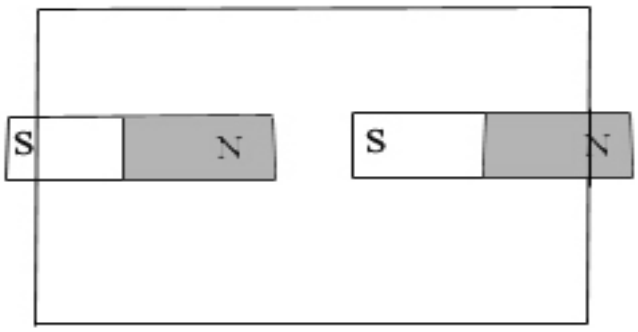


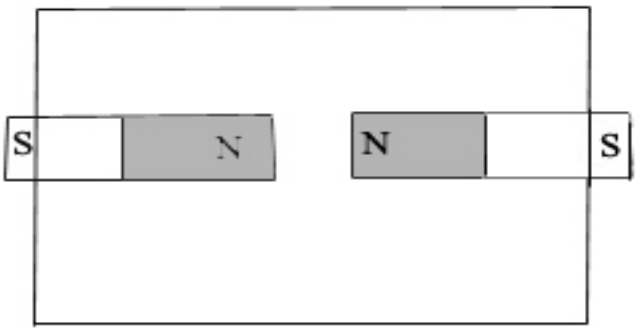
Procedures:

1. Set the two books so that there is a space of at least four inches between them.
2. Place the sheet of glass on the books so that the books become a support.
3. Move the two magnets under the supported sheet of glass and between the books. The magnets should be placed so that the N pole of one magnet is facing the S pole of the other magnet.
4. Sprinkle iron filings on the top of the glass and make observations.
5. Repeat this experiment but this time have identical poles facing each other.

Observations:

1. Draw what you observed from Procedures 4 and 5 above.





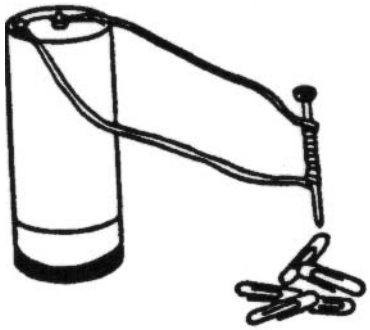
Conclusion: What do the lines of filings tell you about the invisible magnetic lines of force?

Name _____

MAGNETISM

Electromagnets

Purpose: To construct a working electromagnet.



Materials:

1. iron nail about 3" long
2. 1 and a half volt dry cell
3. insulated wire
4. paper clips

Procedures:

1. Wrap the insulated wire around the iron nail with as many turns as you can. Be sure to leave wire on the ends to allow a hookup with the dry cell.
2. Remove about an inch of insulation from the ends of the wire.
3. Bring the nail and wire close to a pile of paper clips. Make observations. Write an answer for observation 1.
4. Attach the ends of the wire to the dry cell and repeat procedure 3. Make observations. Write an answer for observation 2.
5. Disconnect the dry cell and make observations. Write an answer for observation 3.

Observations: You may use the back of this paper to record your observations or use a separate piece of paper.

1. Are the nail and wire magnetic?
2. When connected to the dry cell, did the iron nail attract or pick up paper clips?
3. What happened to the magnetism of the nail when the dry cell was disconnected?

Conclusion: Under what conditions will an electromagnet pick up things made of iron?

Things to try:

What would happen if there were fewer turns of wire?
What about more turns of wire?
What if you add a stronger dry cell or more than one dry cell?

Name _____

MAGNETISM

Post-Test

Part A Directions: Circle the word that completes the sentence.

1. Magnetism and _____ are related.
   protons
   electricity
   atoms
2. The ends of a magnet are called _____.
   poles
   attract
   circuits
3. When two magnets are brought close to each other they try to move apart, we say the two magnets _____ each other.
   attract
   repel
   circuit
4. If two magnets come together, we say they _____ each other.
   attract
   repel
   circuit
5. The first magnets were called _____ .
   poles
   lodestones
   circuits

Part B Directions: Answer the following questions with a short answer.

1. Circle the picture that shows two magnets attracting each other.

A   **B**  

2. What can an electromagnet do that can't be done with a regular magnet?

3. Describe some ways electromagnets are used.

4. If we brought two magnets together, what would you expect to happen if the same poles are facing each other?