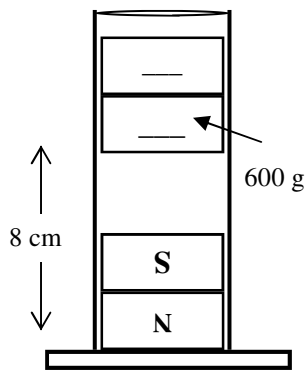
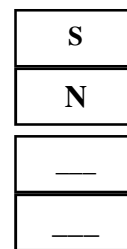


- Magnets have two sides called: \_\_\_\_\_.
- Instead of positive and negative they are called: \_\_\_\_\_ and \_\_\_\_\_.
- In the diagram at the right, the two magnets are attracted to each other. Label the blanks on the lower magnet.



- Two magnets are placed inside a graduated cylinder. The upper magnet is suspended in the air because it is being repelled by the lower magnet (called magnetic levitation [MagLev]).
  - Label the top magnet.
  - Since  $1000\text{g} = 1\text{ kg}$ , the object has a mass of \_\_\_\_\_ kg.
  - What is the weight of the object?
  - How much force is the bottom magnet exerting on the top magnet?
  - How much force is the top magnet exerting on the lower magnet.
  - This must be true due to which of Newton's Laws?
  - Remembering to use meter, calculate the energy of the upper magnet.

- Two circular magnets are placed on a table next to each other.
  - Attract or repel?



- Attract or repel?

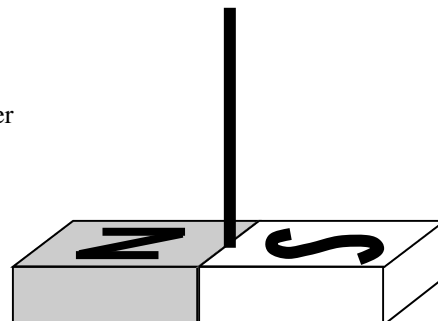


*For the next few questions you will need a magnet. Either borrow one off the refrigerator or borrow one BEFORE class starts.*

- Find an aluminum can. Is a magnet attracted to aluminum?
- Find a penny. Is a magnet attracted to a copper?
- Find a paper clip (made of stainless steel [which is partly made of iron]). Is a magnet attracted to steel?
- A magnet will pick up any piece of metal. True or False?
- Find something to which the magnet is attracted. Pull the magnet away from the object, little by little. Does the magnetic force increase or decrease?
- So, does magnetic force increase or decrease with distance?

*Starting in your book on page 767...*

- A bar magnetic as seen at the right, is suspended by a string so that it is free to turn.
  - Which side of the magnet points toward the earth's north pole?
  - The magnet stops moving in the position shown, which side of this piece of paper is facing toward the earth's north pole?
  - The earth's geographic north pole is what pole of the earth's internal magnetic field?
- What does Maglev mean?
  - Give the book's example of Maglev.



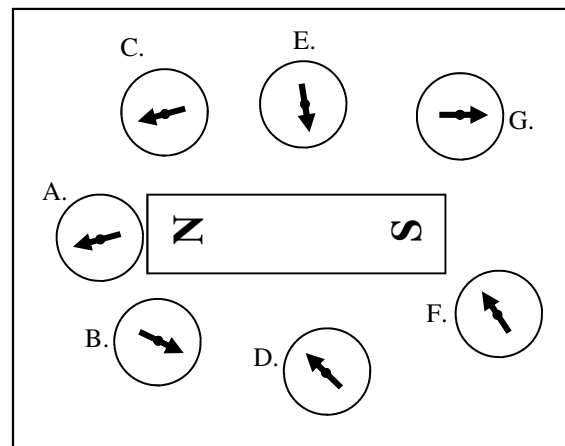
14. Describe how to separate a north from a south pole.
15. Give two ways to magnetize a piece of iron.
  - i.
  - ii.
16. Give two ways to unmagnetize the iron.
17. What is a soft magnetic material (and give an example)?
18. What is a hard magnetic material (and give an example)?

19. Study Figure 21-2.

A. Magnetic field lines always point from \_\_\_\_ to \_\_\_\_.

*Just like with electric field lines, when the magnetic field lines are closer together, the field strength is greater.*

B. In the diagram at the right, which compasses are correct?



20. What variable do we use for magnetic field?
21. How is the direction of B defined?
22. Describe the relationship between the magnetic and geographic north poles of the earth.
23. Where does the earth's magnetic field come from?

*More on back  
Turn to p.772—*

24. What is the classical explanation of the origin of magnetism?
25. Why is it that most materials are not magnetic?
26. What three metals tend to have magnetic properties?
27. Why are they magnetic?
28. Define and explain "magnetic domains". (PS—this is VERY important.)