# 2009 Magnetism 1

Name: _____

*End of Course Exams will be May 22 and May 25.  All students will have to take it.  It will cover ALL of the material from this year. We will be preparing each day for this test and on the homeworks.  As a result homework will be graded at the very beginning of class with no time to ask questions.  Do so before class starts!*

1. *The following are questions you should be able to answer from your current knowledge of magnets.*
2. Magnets have two sides called: _____.
3. Instead of positive and negative they are called: _____ and _____.

4. In the diagram at the right, the two magnets are attracted to each other.  Label the blanks on the lower magnet.

| S |
|---|
| N |

| ___ |
|---|
| ___ |
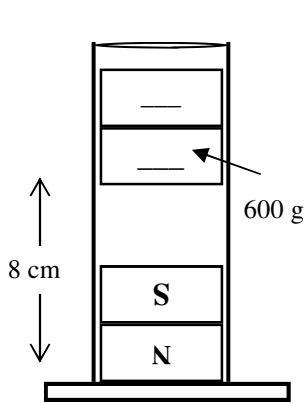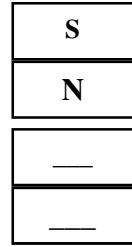
5. Two magnets are placed inside a graduated cylinder.  The upper magnet is suspended in the air because it is being repelled by the lower magnet (called magnetic levitation [MagLev}).
   A. Label the top magnet.
   B. Since 1000g = 1 kg, the object has a mass of _____ kg.
   C. What is the weight of the object?

   D. How much force is the bottom magnet exerting on the top magnet?

   E. How much force is the top magnet exerting on the lower magnet.

   F. This must be true due to which of Newton's Laws?

   G. Remembering to use meter, calculate the energy of the upper magnet.

600 g

8 cm

| ___ |
|---|
| ___ |

| S |
|---|
| N |

6. Two circular magnets are placed on a table next to each other.

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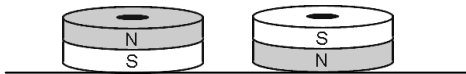
   B. Attract or repel?
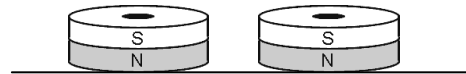
   *For the next few questions you will need a magnet.  Either borrow one off the refrigerator or borrow one BEFORE class starts.*

7. Find an aluminum can.  Is a magnet attracted to aluminum?
8. Find a penny.  Is a magnet attracted to a copper?
9. Find a paper clip (made of stainless steel [which is partly made of iron]).  Is a magnet attracted to steel?
10. A magnet will pick up any piece of metal.  True or False?

11. 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?
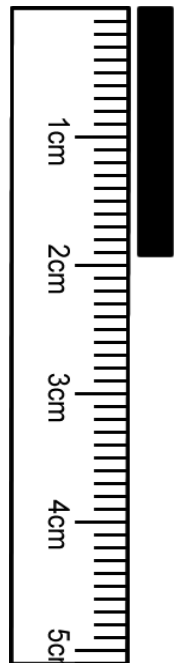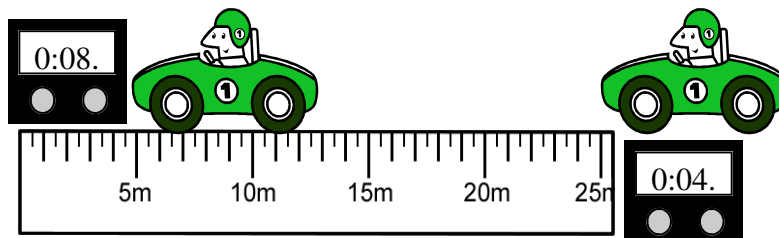
12. So, does magnetic force increase or decrease with distance?

13. Use the ruler at the right to answer the following.
    A.  How long is the black line in millimeter?    B.  In centimeters?    D.  In meters?
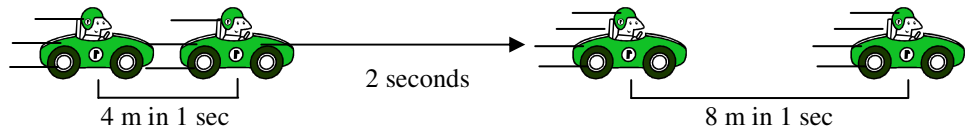
14. A.  Does the car have a positive or negative speed?

    B.  Determine  the speed of the car.

0:08.

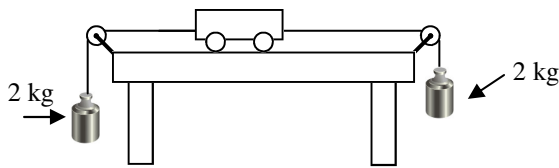0:04.

5m    10m    15m    20m    25m

1cm  2cm  3cm  4cm  5cm

15. A. Is the car at the right at constant speed or accelerating?

    B. How do you know?

    C. Calculate the acceleration of the car.

2 seconds

4 m in 1 sec

8 m in 1 sec

*Low friction cart*

2 kg

2 kg

16. A. What is the acceleration of the cart at the left?

    B. Which way is it moving?

Object A

Object B
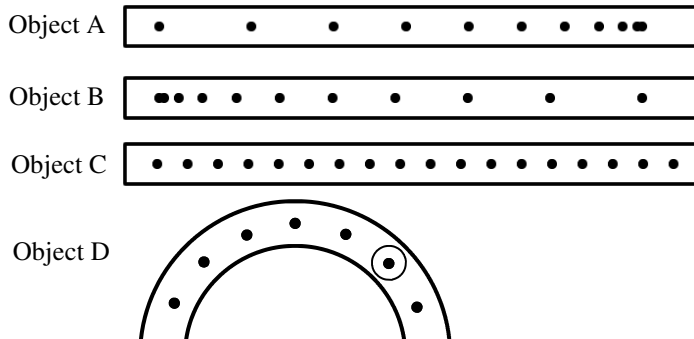
Object C

Object D

17. From "Acceleration" notes.
    The dots show the position of objects each second.
    Which object or objects show the following?

    _____ Constant speed.          _____ Distance increases
    _____ Positive acceleration.    _____ Starts at rest.
    _____ At constant velocity.     _____ Is stopping.
    _____ Accelerating.             _____ Constant direction.
    _____ Decelerating.             _____ Negative acceleration.
    _____ Acceleration = 0.         _____ $V_i = V_f$

18. At the position of the circled dot above draw and label an arrow that shows the direction of its acceleration.

4 m/s

A

6 m/s

B

3 kg

2 kg

2 m

2 m
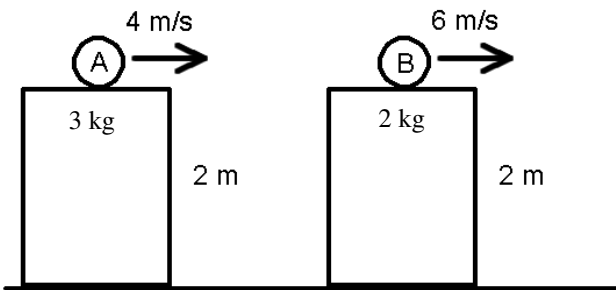
19. Two objects are thrown horizontally off of two identical tables.
    A. When ball A hits the ground, what will be its vertical displacement? $\Delta y =$

    B. Which one will have the greater range?
    C. Why?

    D. What is the initial vertical velocity of ball B? $Vy_i =$

    E. What is the vertical acceleration of ball A? $a_y =$

    F. If ball A is heavier than ball B, which ball hits the ground first?

    G. How much potential energy does ball A have to begin with?

    H. How much kinetic energy does ball A have to begin with?

20. From "Projectile Motion" notes or Study Help.
    A. Fill in the information on the graphic at the right.

    B. How was 30.6 m/s calculated?

    C. Calculate $\Delta x$.

**y-dir.**
$V_i =$
$V_f =$
$a_y =$
$\Delta y =$
$t =$    6.25 sec

**x-dir.**
$V_i =$
$V_f =$
$a_x =$
$\Delta x =$
$t =$

?

30.6 m/s

40 m/s

50°

25.7 m/s