A-day: Due Wed., May 26
B-day: Due Thurs, May 27

2009-10 Magnetism 5

Name: _____

I cannot put everything on one homework. What was covered on Magnetism 5 will not be covered on this homework. Also, there is enough information on Transformers in the notes and the website. I won't go over it again.

1. Two current carrying wires are shown at the left. They have current flowing in the same direction.
   A. Below wire 1, which direction does wire 1's magnetic field point?
   B. Above wire 2, which direction does wire 2's magnetic field point?
   C. So, do the wires attract or repel each other?
2. Two current carrying wires have current flowing in opposite directions. Will they be attracted or repelled by each other?

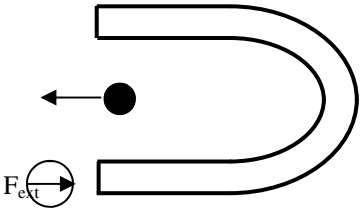
3. Electrons have a negative c_____. Protons have a positive c_____. Neutron have a no c_____.
4. What is electricity?
5. A moving c_____ feels a m_____ force. Moving e_____ causes m_____.
6. So, what causes both electricity and magnetism?
7. (*From "Magnet" notes*) On the atomic level, what causes magnetism?

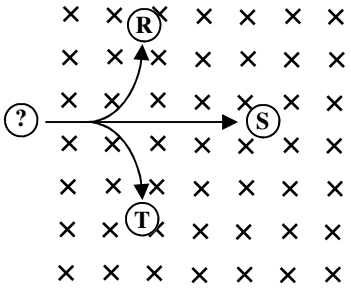
8. If the atomic magnets line up in the same direction, is the substance magnetic?

From your book (we have a book?) or the Internet, etc...

9. Where does the Earth's magnetic field come from?

10. How does the Earth's magnetic field protect us here on Earth?





11. A. Use the compass at the left to decide which side is N and S.
    The wire is pulled to the left by an external force.
    B. Is the magnet moving the wire?
    C. So, what part of the right hand rule (RHR) is the moving wire?
    D. Which direction does the magnetic field point?
    E. Which direction will the magnetic force be in the wire?
    F. Which direction will the induced current be?

12. Scientists need to determine the charge of a particle, so they project it (shoot it) into a magnetic field. By watching its path, they will know its charge.
    A. ___Which path would prove it is negatively charged?
    B. ___Which path would prove it has no charge?
    C. ___Which path would prove it is positively charged?

This is one way that scientists can determine the charge of a particle. The picture at the left is that of "pair production", when an electron and a positron (an anti-electron) are formed in a nuclear accelerator. (I don't know which is which because I don't know the direction of the magnetic field.) The two particles have equal mass (more mass would be a much larger spiral path), but you can see by the opposite paths that they have opposite charges. The positron is the antimatter particle of an electron.

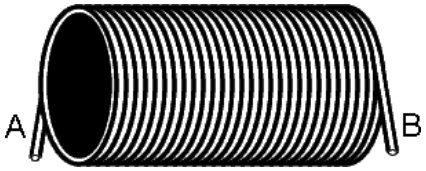
13. Attracted to a magnetic: yes or no?

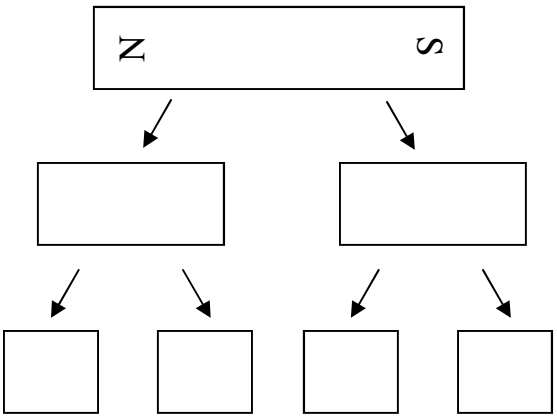
A._____Aluminum
B._____Steel
C._____A penny
D._____A compass
E._____A copper wire with no electricity flowing.
F._____A current carrying wire.
G. ____A moving charge.
H. ____Another magnetic
I. _____Iron
J. _____A charge at rest (a stationary charge).

14. Permanent magnet, temporary magnet, electromagnet?

A._____A piece of iron when next to a magnet.
B._____Will not lose its magnetism.
C._____Loops of wire when electricity is flowing.
D._____Can have its poles switched by a second magnet.

15. Use the diagram at the right to answer the following.
   A. The coils of wire is called a: _____.
   B. If positive current flows into A and out B, which side is North?
   C. If positive current flows into B and out A, which side is North?
   D. So, when the current flowing thru the wires is reverse, the direction of the magnetic field is r_____.
   E. Where is the magnetic field the strongest: inside the center of the coils; at the opening; on the side of the coils?





16. A bar magnet is split in half. Each of the two halves is also halved.
   A. Label each of the bars.
   B. So, how small would one of the bars have to be to have just a single North or single South pole?