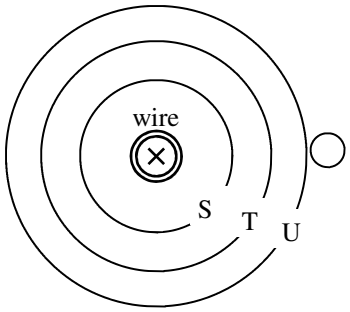
A-Day Due Mon., May 18
B-Day: Due Tues., May 19

2009 PreAP Magnetism 4

You should first complete the regular physics homework: Magnetism 4.



1. The diagram at the right shows a wire with current flowing into the page.
   A. Draw arrows on the rings to show the direction of the magnetic field.
   B. At which ring (S, T, or U) will the magnetic field be strongest?
   C. How would the magnetic field strength change if the current is increased?

   D. In the small circle, draw the compass needle.

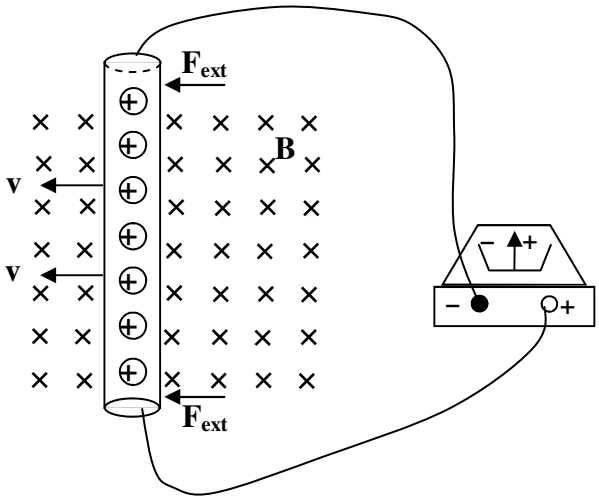
2. An electron is stationary above the equator in the earth's magnetic field.
   A. Give the direction of the magnetic force on the electron.

   The electron is then dropped.
   B. Give the direction of the magnetic force on the electron.
   C. Describe the path of the electron.

Starting in your book on p.794

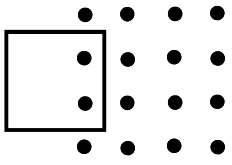
3. Define electromagnetic induction.

4. A wire is moved while inside a magnetic field, as shown at the right. Notice that the wire is NOT being moved by the magnetic force, but by an external force (by a person).
   A. What part of the RHR is the moving wire?
   B. Which direction will the magnetic force inside the wire?
   C. Which direction will the induced current flow inside the wire?
   D. If the wire is connected to a galvanometer as shown, will the galvanometer read positive or negative?

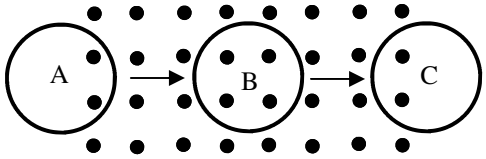


5. (*Bottom of p. 795*) When is the induced emf greatest: when the moving loop is perpendicular or parallel to the field?

6. (*Top of p.797)* Changing what causes induction?



7. A square loop of wire is moving into a magnetic field.
   A. Which sides of the loop break magnetic field lines?
   B. Which sides of the loop will not experience a magnetic force?
   C. Remembering that the moving wire is the moving charge in the RHR, determine the direction of the induced current in the loop as it enters the field.



8. A circular loop of wire is move into, thru, and out of a magnetic field.
   A. When does the magnetic field strength change in the loop?

   B. When will there be no induced current?

   C. Use the RHR to determine the direction of $F_{magnetic}$ in each loop.

9. A magnetic is moved into a solenoid (coils of wire). When is there an induced current: when it moves in; when it is stationary inside; when it moves out?

(p.804) Use the diagram at the bottom of the page to answer the following.

10. The loop of wire is turning in a magnetic field. In part A of the diagram notice that the wire loop is perpendicular to B.
    A. Is the loop breaking any field lines in part A?
    B. Is there any induced emf in part A?
    C. Is the loop breaking any field lines in part B?
    D. Is there any induced emf in part B?
    E. Using all of the pictures, does the magnitude of the emf change while the loop is rotated?
    F. Does the direction of the current change while it is rotated?
    G. What kind of current is being produced?