Name _____ # ____ Name _____ # ____

Lab # ___ Date _____

The Deflecting Compass

Materials: D-Cell battery (1.5 V), battery holder with contacts, wire, switch, magnetic compass, 3 connecting wires with alligator clips, tape (optional)

Procedures:

( )1. Distribute the above materials for each pair of students

( )2. Use the alligator clip to attach one of the connecting wires to the + (ANODE) terminal of the battery. Connect the other end of this wire to the longest wire in the tray. Line up the center of the long wire with the compass needle by holding it above the compass. (You may wish to tape this wire down in order to hold its position).

( )3. Attach the other end of the long wire to one side of the push button switch with another connecting wire.

( )4. Use the third connecting wire to attach the remaining side of the switch to the - (CATHODE) terminal of the battery. Your electric circuit should now look like the one pictured above

( )5. Pay attention to the compass needle and press the switch to complete (close) the circuit. What happens?

Questions:

( )1. What did the compass needle do when the circuit was completed?

( )2. How did the compass needle deflect when it was above or under the wire?

( )3. What is the reason for the compass needle to move?

( )4. What would the compass do if a magnet were to approach it?

( )5. What can we conclude about the surroundings of an electric current?

Explanation:This laboratory shows that a MAGNETIC FIELD exists around an electric current. As soon as the circuit is completed, by closing the switch, the North-pointing needle of the compass will deflect to the left (the way it is set up in the sketch). This illustrated the LEFT-HAND RULE: When holding the left hand over a compass, such that the flow of electrons is from the wrist to the fingertips, the thumb and the compass needle will point in the direction of the north pole of the magnetic field. (Make sure that the palm is facing the compass).

Follow-up:Each laboratory partner is to copy the above explanation on a separate sheet of paper and attach it behind this page before turning the lab in for a grade.