Electromagnetic Induction Worksheet

Procedure:

1a) Deflection when circuit is closed:_________________________________

Note: if the deflection is negative, re-wire the circuit (battery poles) such that the deflection is positive when the circuit is closed. It should be negative when the circuit is re-opened.

1b) Now the deflection when circuit is closed:___________________________

2) You may need two or three loops of the wire.
   i) N pushed IN
   a) Deflection of galvanometer needle:_______________________________

   b) Indicate the direction of the current in the diagram to the right.

   c) Use the right hand rule (RHR) to find the direction of the field due to this induced current.

   d) Is Lenz’ Law obeyed? _________
   Explain:

   ii) N pulled OUT
   a) Deflection of galvanometer needle:_______________________________

   b) Indicate the direction of the current in the diagram to the right.

   c) Use the right hand rule (RHR) to find the direction of the field due to this induced current.

   d) Is Lenz’ Law obeyed? _________
   Explain:
iii) S pushed IN
  a) Deflection of galvanometer needle: __________________________

  b) Indicate the direction of the current in the diagram to the right.

  c) Use the right hand rule (RHR) to find the direction of the field due to this induced current.

  d) Is Lenz' Law obeyed? ________
     Explain:

iv) S pulled OUT
  a) Deflection of galvanometer needle: __________________________

  b) Indicate the direction of the current in the diagram to the right.

  c) Use the right hand rule (RHR) to find the direction of the field due to this induced current.

  d) Is Lenz' Law obeyed? ________
     Explain:

3) View the coil with the post facing you.

N pushed IN:
  Deflection: __________________________________________
  Explanation: __________________________________________
                                                                 ______________________________________________________________________
                                                                 ______________________________________________________________________
N pulled OUT:
  Deflection: __________________________________________
  Explanation: __________________________________________
                                                                 ______________________________________________________________________
                                                                 ______________________________________________________________________
S pushed IN:
    Deflection:______________________________________
    Explanation:____________________________________________________


S pulled OUT:
    Deflection:______________________________________
    Explanation:____________________________________________________


4) Place a second coil adjacent to the first. One coil is connected to a battery, the OTHER is connected to the galvanometer:

Battery Connected:
    Deflection:______________________________________
    Explanation:____________________________________________________

Battery Disconnected:
    Deflection:______________________________________
    Explanation:____________________________________________________


5) Connect the battery and let the needle come to rest.

Quickly move second coil away:
    Deflection:______________________________________
    Explanation:____________________________________________________

Quickly move second coil towards:
    Deflection:______________________________________
    Explanation:____________________________________________________
6) Repeat (4) with the straight soft iron core inserted.

Battery Connected:
   Deflection:____________________________________
Battery Disconnected:
   Deflection:____________________________________
Effect of iron core:____________________________________

7) Repeat (6) with the U-shaped soft iron core inserted.

Battery Connected:
   Deflection:____________________________________
Battery Disconnected:
   Deflection:____________________________________
Effect of iron core:____________________________________

Battery Connected:____________________________________
Battery Disconnected:____________________________________
Effect of iron core:____________________________________