

Name: _____

Period: _____

AP Physics: Magnetism Lab

Go to the following website

http://phet.colorado.edu/simulations/sims.php?sim=Magnets_and_Electromagnets[^] [^] (those are underscores)

Click **Run Now!**

Move the compass around the bar magnet.

1. Which pole of the magnet does the red compass needle point towards?

Click “Flip Polarity” in the right menu.

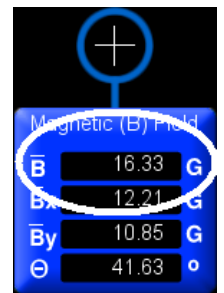
2. Now which pole of the magnet does the red needle point towards? Does it still point toward the same pole?

3. This means that the red part of the needle is a _____ pole.

Click **Reset All** in the right menu.

Check the box “Show Field Meter” in the right menu. A blue box should appear. This measures the Magnetic Field around the magnet (which is known as ‘B’). The Magnetic field is measured in Gauss (G). Move the field meter around the magnet.

4. Does the field increase or decrease as you move the meter closer to the magnet?



Move your meter so that it is about one inch (on your computer screen) away from the North end of your magnet.

5. What is the magnitude of field strength (B) in Gauss?

Now move the meter the same distance away from the South end of your magnet.

6. Is the amount of magnetic field the same for both North and South ends of a magnet?

At the top left of the simulation window, click the “Electromagnet” tab. You should see a battery connected to a wire with loops that has current running through it. Move your compass around the electromagnet.

7. Is the left side of the electromagnet the North end or the South end? How do you know?

Click “Show Field Meter” in the right menu.

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8. Move the meter around the electromagnet. Does the field strength increase or decrease as you move the meter closer to the electromagnet?

Place the meter about one inch (on your screen) from the left side of the electromagnet.

In the right menu you can adjust the number of loops in your electromagnet.

Loops:

For each number of loops (1-4) write down the field strength in the table below.

# Loops	Field Strength (in G)
1	
2	
3	
4	

9. Based on your data above, does the amount of field strength increase or decrease as you increase the number of loops in an electromagnet?

Set the number of loops for your electromagnet back to 4 and make sure your field meter is still one inch from the left side of the coils. Your battery has a sliding bar on it that lets you adjust the voltage in your electromagnet. Complete the table below by adjusting the voltage on the battery and writing down the field strength at each voltage.



Voltage (in V)	Field Strength (in G)
0	
2	
4	
6	
8	
10	

10. Based on your data above, what is the relationship between voltage and field strength in an electromagnet?