

Magnetic Force due to a Current Lab

Procedure

Make a chart with Quantity Measured/Symbol for Measurement/Instrument Used. Briefly, but completely, describe the procedure for this lab – and include labeled sketches.

Data

$$I = \underline{\hspace{2cm}}$$

$$L = \underline{\hspace{2cm}}$$

<i>m</i>	<i>F</i>	<i>L</i>

<i>m</i>	<i>F</i>	<i>I</i>

Graphs

Graph *F* on the y-axis and current, *I*, on the x-axis. Then, graph *F* on the y-axis and length, *L*, on the x-axis. Draw the best fits line for each graph.

Questions

- 1) Explain why the change in apparent weight of the PVC/magnet thing is equal to the magnetic force exerted on the current carrying wire. What direction is the magnetic force acting on the PVC/magnet thing? Explain how you know.
- 2) Draw the wire as seen from the front and slightly above. Draw the direction of the current acting on the wire, and the direction of the magnetic force acting on the wire. Finally, which direction is the magnetic field in the PVC/magnet thing? As seen from the front, right to left, or left to right? Explain your answer.
- 3) Find the slope of your first graph. Use your slope to find the strength of the magnetic field used. Show your work, and include units.
- 4) Find the slope of your second graph. Use your slope to find the strength of the magnetic field used. Show your work, and include units.
- 5) Since neither value above can be considered an accepted value, find the percent difference between the magnetic fields calculated, rather than the percent error.

Error Analysis

Thoroughly explain what the main sources of error are for this lab, and how you would correct them.

