

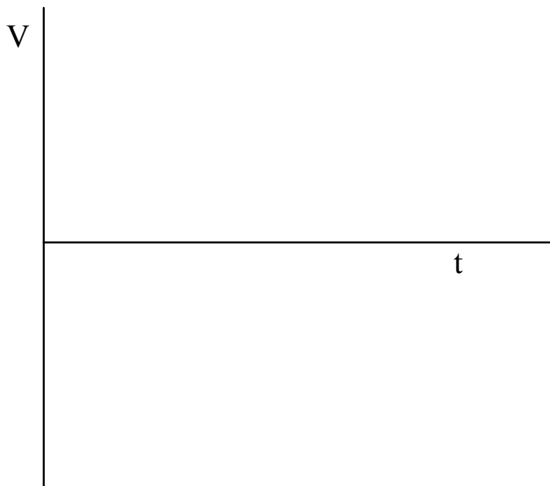
Name: _____ Partner: _____ PH2223 - ____

Experiment Sheet for Faraday's Law of Induction

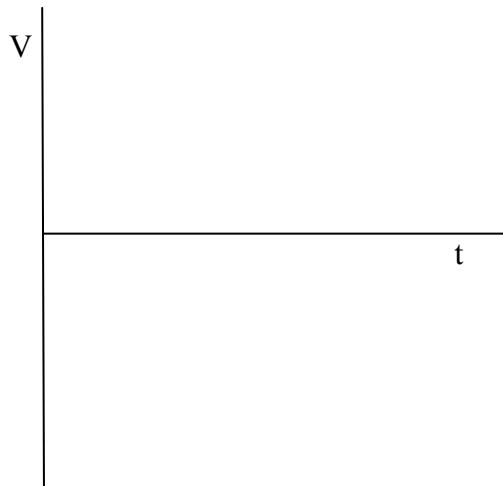
Moving Magnets In and then Out

Sketch what your V vs. t graph looked like when you put the magnets into the coil and when you pulled your magnets out of the coil (only have to sketch one set of in and out).

V vs. t for putting magnets into coil



V vs. t for pulling magnets out of coil



Dropping Magnets Through the Coil

Sketch what your V vs. t graph looked like when you dropped the magnets through the coil (only have to sketch one of your drops).

V vs. t for dropping magnets through the coil



Questions:

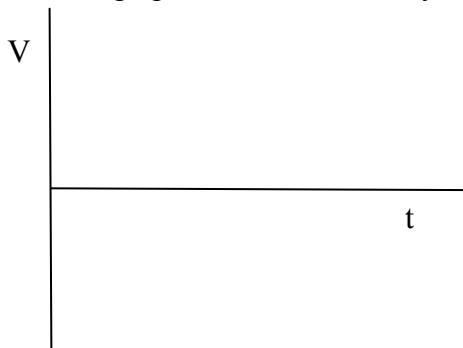
1. Explain why in the previous graphs the voltage pulses are sometimes negative and sometimes positive.
2. Explain why when the magnets fell through the coil one of the voltage pulses was taller and skinnier than the other.
3. When magnets are dropped through a coil what should $\Delta\Phi_{\text{total}}$ be (for the whole trip)? ____
Assume the magnets start and end the same distance from the coil.
4. Graphically what did you find for: $N\Delta\Phi_{\text{in}} =$ _____,
 $N\Delta\Phi_{\text{out}} =$ _____, and $N\Delta\Phi_{\text{total}} =$ _____.
5. When you dropped the magnets from a higher point did it result in greater or lesser voltages and why?

Moving Coil to find BQuestions:

1. What did you get for $\left| \int V dt \right|$ (area of graph region)? _____
2. Using your answer for $\left| \int V dt \right|$ find the strength of the magnetic field of your magnet (B).
Show your calculation in the space below.

$$B \approx \underline{\hspace{2cm}}$$

3. Sketch what your V vs. t graph looked like when you rotated your coil in the magnetic field.



4. Explain why the graphed looked like this.

Transformers

Questions:

1. Even though your outer coil was not hooked up to the voltage source it still had a voltage output. Why? How did it get this voltage?
2. What was the ratio of the peak voltages of the outer to inner coil without the iron rod? _____
3. What was the ratio of the peak voltages of the outer to inner coil with the iron rod? _____
4. What does the iron rod do?
5. Which coil do you think had more turns (loops) of wire (outer or inner)? _____
6. Was this a step-up or a step-down transformer? _____