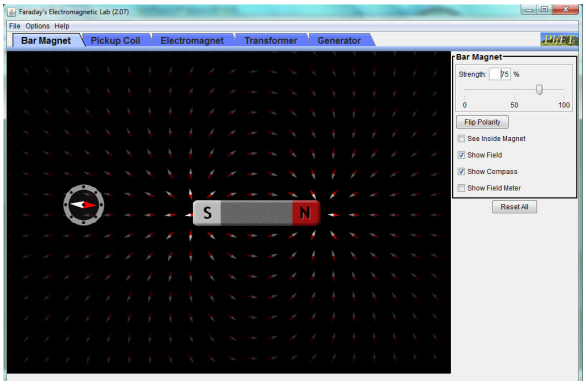
Do not copy or attach
or print out this manual
for your lab report.
Follow the instruction.

Conceptual Lab for the Magnetic Field and Electromagnetic Induction

Your name _____ Instructor's sign _____

Go at http://phet.colorado.edu/en/simulation/faraday and download the software.

1. A magnet and magnetic fields



- Select the tab, "Bar Magnet." Find

- Discover three rules from the simulation. (You can change any parameters in the category.) For example, "The N-pole of the compass is always directed to the S-pole of the magnet." ⇐ Do not use this for your answers.

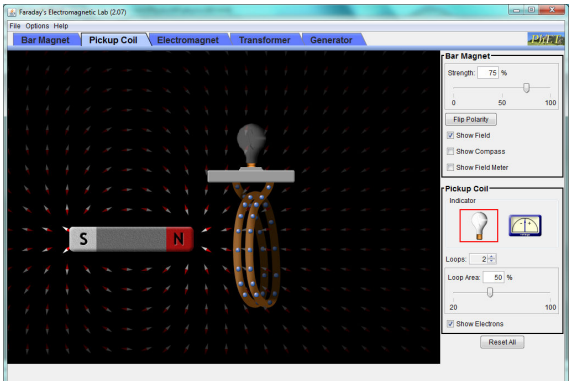
◆ **Question 1**: Write down three of your discoveries, and explain them to your instructor.

➢ _____

➢ _____

➢ _____

2. Electromagnetic induction



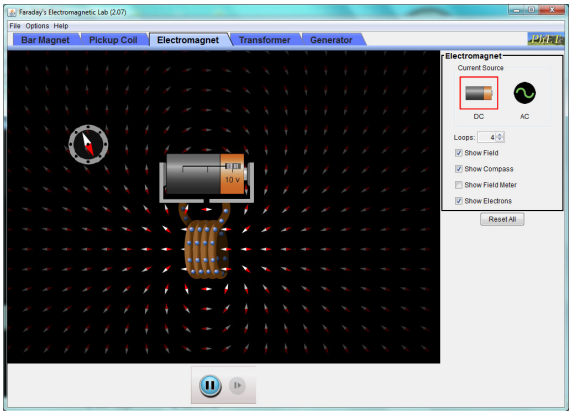
- Click the tab, Pickup Coil.

- Move the magnet inside the coil.

◆ **Question 2**: How do you describe the relationship between the speed of the magnet and the brightness of the light?

◆ **Question 3**: How about if you move the magnet outside the coil? Does the result make sense to you? Explain.

3. Direct and alternating currents for electromagnetic induction

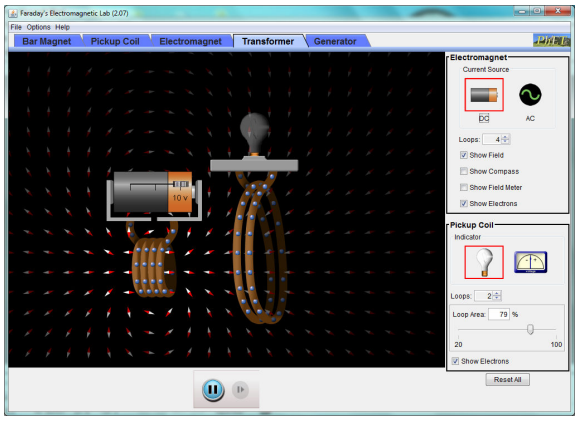


- Click "Electromagnet" tab.

- Select the current source DC and AC in the menu.

◆ **Question 4**: What are the differences when you use DC or AC current?

4. Transformer (mutual inductance)



- Click "Transformer" tab.
- Switch from DC to AC in the menu.
- Move the primary coil around the secondary coil.
- Change any of parameters from the menu to observe the change of the phenomenon.

◆ **Question 5**: What is the main difference between when using DC and AC voltage sources?

◆ **Question 6**: What makes the large change of the "mutual inductance"? (The mutual inductance is the capability of inducing the voltage from one coil to the other.)

You are not allowed to leave until you and your partners answer all of the above questions!! All of the group member must have consensus to the answers.

For the lab report

① Write the introduction. ② Write the discussions and conclusion including the answers of the questions above.