

Lab 8: Faraday's Law Simulation

- 1) Ways to cause induction
 - a) Reversing the polarity of the magnet
 - b) Moving the magnet relative to the coil, at least partially parallel to the axis of the coil.
- 2) I think induction occurred because the light bulb lit up, proving a current to exist in the wires.
- 3) Any change to the magnetic field inside the coil of wire.
 - a) Moving the coil
- 4) The simpler simulation expects us to discover the changing magnetic field, whereas this one can be used for making equations and simulating actual events, to predict an outcome. Therefore, this one needs to be more accurate, and show more variables.
- 5) Induction is the creation of a voltage difference in a wire by manipulating the magnetic field around it.
- 6) A light bulb and voltmeter will both detect the presence of current, and therefore also a voltage difference, in a wire. Both can be used to detect whether induction is happening. The bulb has a brightness based on the current flowing in the wire though, so it is used for detecting the relative amount of current created. A voltmeter is more direct, since induction creates voltage, and it directly measures that voltage.
- 7) We can measure the size of the current by using a voltmeter, and measure the maximum voltage of the meter during a trial, since voltage is proportional to current. We can use the voltmeter to determine the direction of that current. Then, we can manipulate different variables and run trials to see how these dependent variables change. Move the magnet through the coil, north end first, then back it out, moving the south end first.

Loop Area	Loop Count	Magnet Strength	Voltage	Direction
50	1	75	5	+ Then -
50	1	100	8	+ Then -
50	3	75	15	+ Then -
100	1	75	5	

8) Induction is caused by any change in the magnetic field inside of a coil, which is caused by moving a magnet at least partially parallel to the axis of the coil. It can also be caused by moving a coil around a magnet, in the same manner. The direction of the current is dependant only on the direction of the magnetic field inside the coil. So reversing the polarity of the magnet, or moving it through the other way, will cause the current to go the other way. The strength of the current is dependant on the strength of the magnet, and the number of loops in the coil.