Name: _____ Date: _____ Hour: _____

Building an Electromagnet Lab

Purpose: To further understand and investigate the connections between electric currents and magnetic fields. We will create electromagnets and test their strength in various situations.

Materials: C or D size batteries, 2-feet of wire, nail, paper clips, tape or a rubber band.

Problem: How will adding more coils around your nail impact your electromagnet's strength? How will adding more batteries affect what your electromagnet is able to pick up?

Hypothesis:

Procedure: Using the materials listed above, engineer your electromagnet to the best of your ability.

Questions:

1. Draw the battery, wire, coil and nail of your electromagnet. Label the positive and negative ends of the battery.

2. Before completing the circuit, describe what happens when you hold a paper clip near the coil.

3. Complete the circuit and hold a paper clip near the coil. Does it hold the paper clip?

4. Now disconnect the wire from the battery, does the electromagnet still hold onto the paper clip? Why do you think your electromagnet behaves this way?

5. Fill in the data tables below:

Coil Data:

Electromagnet	Number of Paper Clips Picked Up
5 coils	
10 coils	
15 coils	
20 coils	
25 coils	
30 coils	
35 coils	

Battery Data:

Electromagnet	Number of Paper Clips Picked Up
1 Battery	
2 Batteries	
3 Batteries	

Graph your data in the proper graph attached!

6. Based upon your data and using your graphs, how many paper clips do you think your electromagnet would hold if you had 40 coils? 70 coils? *Extrapolate the data!

7. Using your graph for battery information, how many paper clips do you think would be held by 4 batteries? 5 batteries?

8. What seemed to have a bigger impact on picking up paper clips, increasing coils or adding more batteries?

9. What are some ways that engineers might be able to use electromagnets?

Conclusion: Answer the problem, state whether your hypothesis was correct or not, and what you learned through doing this lab.