Penny and Nickel Battery

I. Testable Question: How does the number of coins effect current and voltage of a battery?

<u>IV:</u> _____

<u>DV:</u> _____ and _____

II. Hypothesis: _____

III. Materials and Equipment

• Pennies (10)

• Nickels (10)

• Vinegar (any kind, 1/4 C.)

• Salt (1 Tbsp.)

• Small bowl/container

• Small plate (ceramic, plastic, or Styrofoam^{TM}; not paper or metal)

• Digital multimeter (any kind that reads mA and mV)

• Paper towels

• Scissors

IV. Experimental Procedure

1. In a small bowl, mix together 1/4 C. of vinegar (electrolyte) and 1 Tbsp. of salt (ions).

2. Using scissors, cut up a paper towel into small squares, each approximately 1 cm x 1 cm.

3. Place the small squares to soak in the bowl of salt-vinegar solution, and set them aside.

4. Start building your stack on a dry paper towel on your plate. Put down a penny first, then place a square of vinegar-soaked paper towel on top, and then add a nickel. Keep repeating the layers until you have a stack of four coins (alternating pennies, wet paper towel pieces, and nickels), making sure you end with a nickel on top.

5. Attach the leads of the multimeter to the two ends of the battery by touching the negative lead (black) to the penny on the bottom and the other (red) to the nickel on the top. Measure the voltage produced by your battery (in millivolts, mV). Also measure the current produced (in milliamps, mA). Record data in data table.

6. Repeat the experiment, each time adding a pair of coins until you have used 10 pennies and 10 nickels.

One important rule is to always start with a penny and end in a nickel, so the number of layers of penniesand nickels will always match.

V. Data:

Data Table:

Title: _____

Total Number of pennies and nickels	Voltage (mV)	Current (mA)

Make a graph on a separate piece of paper (2 graphs)

What type of graph will you make? _____ Why? _____

VI. Conclusion *(you must use complete sentences to answer the questions):*

a. Why did you do the experiment (what question were you trying to answer?

b. Restate your hypothesis and tell if your data rejects or proves your hypothesis.

c. Explain how at least 3 specific data collected let you decide if your hypothesis was rejected or proven.

d. What did you learn from the experiment?

VII. Reflection: *(you must use complete sentences to answer the questions):*

    a. Give at least 2 possible sources of error and how explain you could correct them in your procedure.

    b. What is a different question that you could ask or a new hypothesis that you could make based upon the knowledge that you gained in this experiment?

    c. Give a real life example to which this lab would apply.