Questions and Calculations **Electrochemical and Electroplating**

1. Calculate the mass gained and lost at each electrode for each trial.

	Trial 1	**Trial 2**
Initial mass of cathode		
Final mass of cathode		
Change in mass of cathode		
Initial mass of anode		
Final mass of anode		
Change in mass of anode		

2. Write the oxidation and reduction half-reactions that occurred at the anode and cathode, respectively. Do these agree with the experiment's results?

3. Calculate the number of moles of copper electroplated at the cathode in each trial. Calculate the number of moles of copper oxidized at the anode in each trial. Assume that the molar mass of copper is 63.546 g/mol.

4. Calculate the number of moles of electrons required to reduce the copper at the cathode and oxidize the copper anode in each trial.

5. Calculate the average current flow in each trial.

6. Calculate the total number of coulombs that passed through the cell in each trial.

7. Calculate the number of electrons used in the electrolysis during each trial.

Electrochemical and Electroplating
Synthesis

1. Use the results from Question 4 and Question 7 to calculate the value of Avogadro's number for each trial. For the number of moles of electrons, use the average values calculated for the cathode and anode in Question 4 for each trial.

2. Calculate the average value of Avogadro's number from the two trials.

3. Calculate the percent error of your calculated value of Avogadro's number.

4. Calculate the value of the Faraday constant in coulombs per mole of electrons from the data in each trial. Additionally, calculate the average of the two trials.

5. Calculate the percent error of your value for the Faraday constant.

6. Which measurement limited the number of significant figures in the experiment? How could the experiment be changed to improve the number of significant figures and the accuracy of the Faraday constant determination?

7. Suppose the variable resistor was not adjusted (or it was not present) and the ammeter readings fluctuated throughout the experiment. How would this affect the results?

8. Suppose that after one of the trials pieces of copper were present in the bottom of the beaker. How would this affect your results?

9. What are possible sources of error in your experiment?