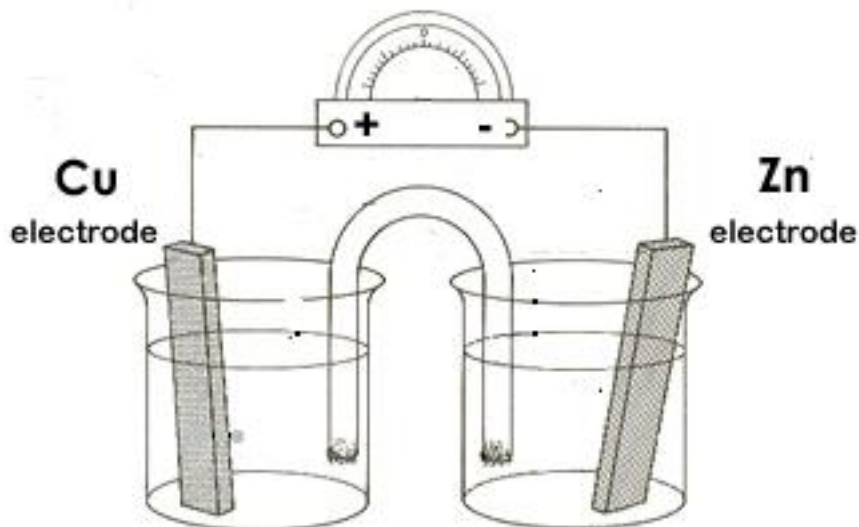## Lab 11: Electrochemical Cells

Name_____   Oxidizing Partner's name_____

Purpose: To build an electrochemical cell with Zn, Cu and the appropriate solutions, to measure its voltage and to find ways of increasing it.

Procedure:

1. Add 0.5 M $CuSO_{4(aq)}$ or $Cu(NO_3)_{2(aq)}$ solution to a 100 mL beaker until it is half-full. Place a clean strip of copper into the solution, and connect it to the positive end of the voltmeter.
2. Take a second beaker and fill half of it with $Zn(NO_3)_2$ solution. Place a clean strip of zinc into the solution, and connect it to the negative end of the voltmeter.
3. Get the salt bridge ready by filling a U-tube with an electrolyte. Seal both ends with cotton, and try to minimize the amount of air in the tube.
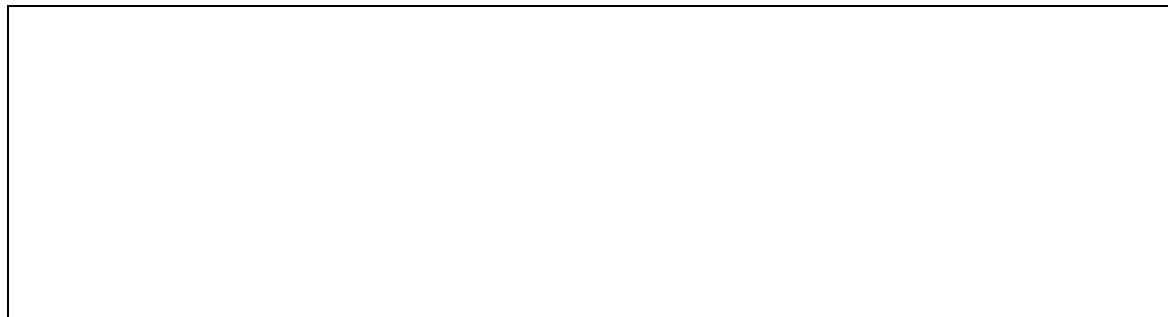4. Record the voltage.

Voltage reading(**use one estimated figure; include unit**)	

5. On the next page, record any changes observed in the next 5 minutes. Try lifting the salt bridge out of the solution, and then placing it back in.
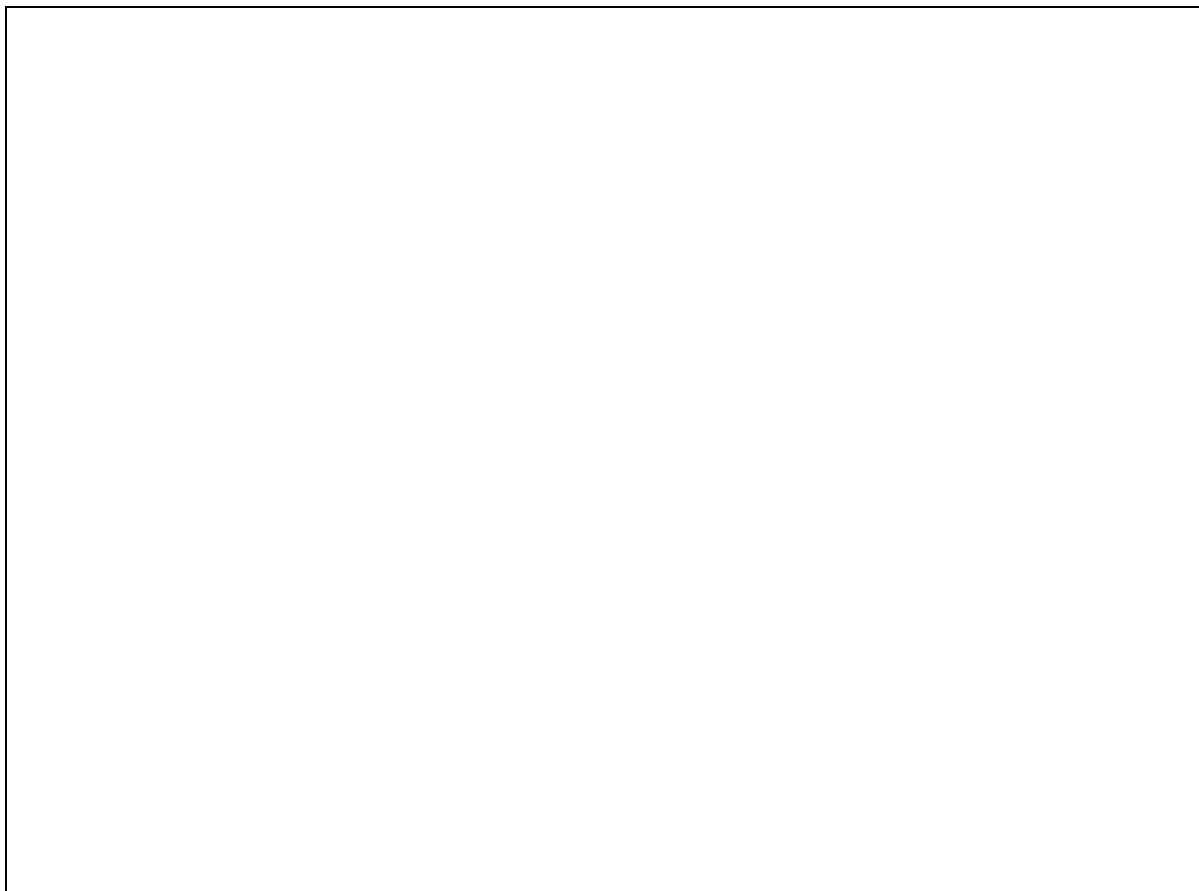
Name_____   Oxidizing Partner's name_____

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6. Use the multi meter to record current_____

7. If you noticed no changes yet, why do you think that
    is?_____

8.   Try connecting your cell and that of your neighbour***'s in a way that increases voltage.***
        What voltage is recorded ?_____

9.   Draw the setup of your battery (the way it's connected to your neighbour's.) Technically
        that's what a battery is: two or more connected cells.

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Lab 11: Electrochemical Cells

Name_____   Oxidizing Partner's name_____

Analysis:

1.   a.   What metal served as the anode?_____

      b.   What in the experiment revealed what the anode
            was?_____

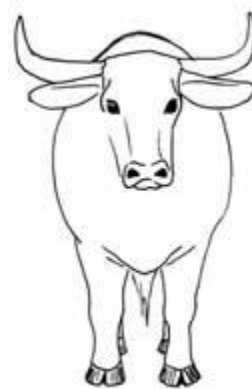2.   Write the two half-reactions that occurred:

      _____

      _____

3.   Write the overall balanced reaction.

      _____

An Ox=

anode = oxidation

4.   Was there any voltage before inserting the salt bridge?_____

5.   Use the measurement of current flowing through your electrochemical cell. Keeping in mind
      that exactly 1A = 1C/s, and that *every mole of electrons* has a charge of 96 400 C, how many
      hours would you have to wait before you saw 1.0 g of copper at the cathode?

Conclusion: