Topic 5.3 – Electric cells **Formative Assessment**

NAME: _____ TEAM:__

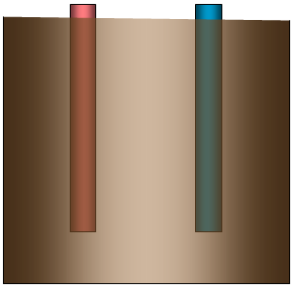
THIS IS A PRACTICE ASSESSMENT. Show formulas, substitutions, answers (in spaces provided) and units!

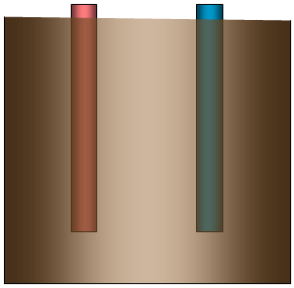
The following questions are about chemical cells.

1. Explain why a chemical cell would use two different types of metal for its terminals, rather than one type. _____
_____.

2. Who was it that is responsible for our using "conventional current" rather than electron current?
2. _____.

3. Sketch and label a chemical cell that uses electron current, and one that uses conventional current. Explain for each of them how the cell makes the charge move. Explain for each of them where the charge has the higher potential.





The following questions are about primary and secondary cells.

4. What is a primary cell? _____.

5. What is a secondary cell? _____.

6. Label each battery/cell with its correct designation: Primary or secondary, cell or battery.

_____ _____

_____

The following question is about changing the potential energy of charges through battery usage.

7. A 225 μC of charge is brought from an electric potential of 2.75 V to an electric potential of 15.75 V through use of a battery. What is the change in potential energy of the charge?

7. _____

The following questions are about a common "battery" such as one found in your calculator.

8. Explain how you would determine the emf of one of the cells in your calculator. _____.

9. Explain how you would find the internal resistance of the same cell using a 3000. Ω resistor.
_____
_____.

Suppose you measure the unloaded p.d. of one of the cells of your calculator to be 1.50 V. Then, while a 3000. Ω resistor is connected across the terminals of the same cell, you measure the loaded p.d. of the cell to be 1.47 V.

10. What is the emf of the cell? 10._____

11. What is the terminal voltage of the cell under the load? 11._____

12. What is the internal resistance of the cell under this load? 12._____

A cell has an unloaded potential difference of 1.38 V. A 1250 Ω resistor is connected as a load as shown in the picture. The meter shows the new p.d.

13. What is the emf of the cell? 13. _____

14. What is the current through the resistor? 14. _____

15. What is the internal resistance of the battery? 15. _____

16. Explain what emf stands for, and in words, what in general is the emf of a cell?
_____. _____.

17. What is the rate at which heat is being produced in the in the 330 Ω resistor?
17._____

18. What is the rate at which heat is being produced in the battery?
18._____

19. What is the rate at which chemical energy is being converted to electrical energy in the cell?
19._____

20. What is the terminal potential difference of this cell under load?
20._____