WATER POTENTIAL WORKSHEET

1. Write the formula for water potential. Explain the meaning of each symbol.

2. Water potential is measured in what two units of measurement?

   _____ and _____

3. What two factors determine water potential? (See equation you wrote above)

4. Explain what direction water will move regarding water potential.

5. Can Ψ_s be a positive number? Explain.

6. Fill in the blanks below.

   Pure water has a Ψ = _____

   If Ψ = -2 bars and Ψ_s = +2 bars, then Ψ_p = _____.

   If Ψ_s = +3 bars and Ψ = 0 bars and, then Ψ_p = _____.

   If Ψ = -9 bars and Ψ_p = +4 bars, then Ψ_s = _____.

Use the following URL for Lab Bench. Click on concept 6. Complete activities for concepts 6,7, and 8.

http://www.phschool.com/science/biology_place/labbench/lab1/watpot.html
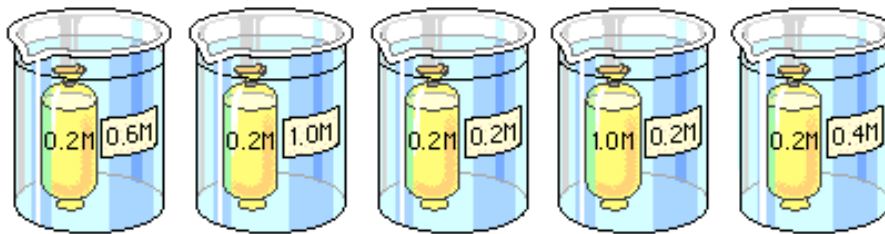**After completing concept 6;**

6. Why does water potential effect animal cells differently than plant cells?

After completing concept 7;

7. Explain how Ψ is effected by adding additional solutes.

**Complete the lab exercise #3 "Water potential and potato cores"**

8. Which beaker(s) contain(s) a solution that is hypertonic to the bag? _____

9. Arrange the beakers above in order of the mass of the bags inside them after the experiment has run for 30 minutes. List the bag that loses the most mass first.

10. In beaker B, what is the water potential of the distilled water in the beaker, and of the beet core?

Beaker Ψ = _____   Beet Core Ψ = _____
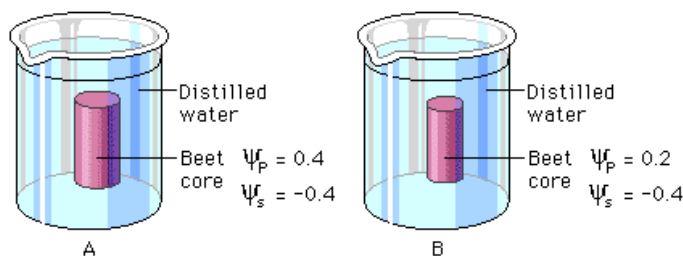
11. Which of the following statements is true for the diagrams above?
   a. The beet core in beaker A is at equilibrium with the surrounding water.
   b. The beet core in beaker B will lose water to the surrounding environment.
   c. The beet core in beaker B would be more turgid than the beet core in beaker A.
   d. The beet core in beaker A is likely to gain so much water that its cells will rupture.
   e. The cells in beet core B are likely to undergo plasmolysis.

12. The formula used to determine Ψ_s.   Explain each component of the formula.

$$\Psi_s \quad = \quad -I \quad \times C \times R \times T$$

13. Calculate, using the above formula, the Ψ_s of a .6 molar sucrose solution, such as that you used in the lab. Show your work.