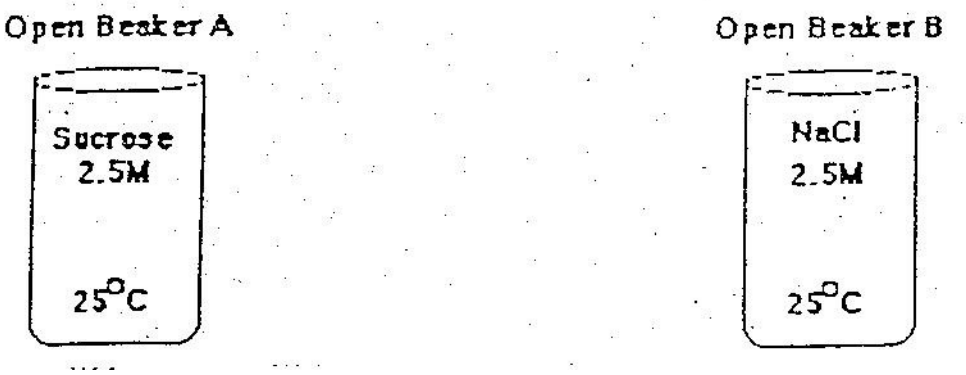
Name_____
AP Biology—Period ____ Date _____
Cell Unit

Introductory Water Potential Worksheet



	Write Symbol	Write Value (A)		Write Symbol	Write Value (B)
Pressure Potential					
Ionization Constant					
Molar Concentration					
Temperature °K					
Pressure Constant					
Solute Potential	Write Symbol	Write Formula		Write Symbol	Write Formula
Solute Potential	Calculations			Calculations	
Solute Potential	Answer			Answer	

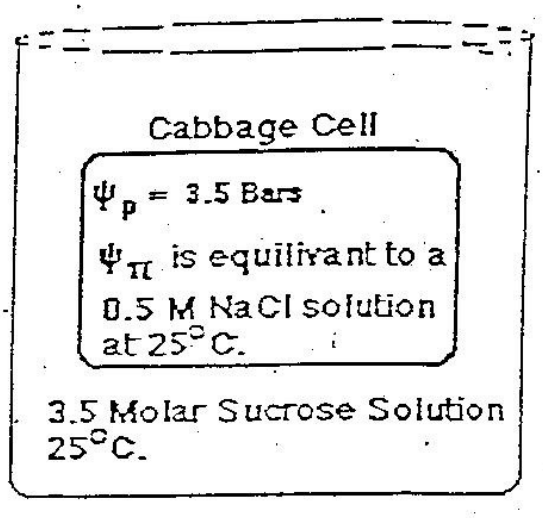
1. Show the complete formula for the calculation of water potential. Use both symbols and word.
2. Substitute the numerical values for each of the following

   Ψ Beaker A = _____ + _____ = _____

   Ψ Beaker B = _____ + _____ = _____

3. If the beakers were connected by a membrane permeable only to water, would the net movement of water be from A to B or B to A? (Circle the correct answer) **Explain**.

   Beaker A to Beaker B Beaker B to Beaker A



4. In the space below calculate the water potential of the fluid in the beaker. Be sequential, show formulas and work.

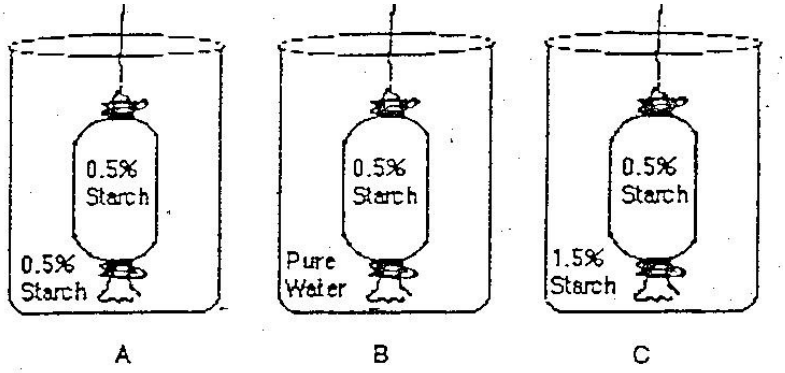
5. In the space below calculate the water potential of the red cabbage cell that has just been placed in the beaker. Be sequential, show formulas and work.

6. If the membrane of the cabbage cell is permeable only to water will water move from cell to beaker of beaker to cell?

7. Use a term to describe the probable appearance of this cell after 3 hours in the beaker.

DIFFUSION - OSMOSIS - DIALYSIS - WATER POTENTIAL

I. Dialysis bags containing a 0.5% starch solution are placed in beakers containing the starch solutions indicated below:



Indicate the letter of the beaker in which the following events occur.

a. The dialysis bag remains the same size _____

b. The dialysis bags swells. ___

c. Water moves from the dialysis bag into the beaker. _____

d. The solution inside the bag is hypotonic to its surroundings. __

e. Water potential inside the bag is higher than water potential outside the bag. _____

f. The solution inside the bag is isotonic.to the solution outside the bag. _____

II. A plant cell, when initially placed in pure water, has a solute potential of -4 bars and a pressure potential of + 2 Bars.

a. Which way will the water osmose? _____

b. When will the net movement of water stop?_____

c. When equilibrium is reached, what are the cell's solute potential and pressure potential values?

Ψ_s = _____ Ψ_p = _____

III. A protozoan cell is placed in a O.5M sucrose solution at 270C. Assume the cell has a solute potential of -2 bars. Because the protozoan lacks a cell wall, it cannot generate turgor pressure and will always have a pressure potential of 0 bars.

a. When the cell is placed in a sucrose solution, which way will water osmose? _____

b. When will the net movement of water stop?_____

c. What will be the appearance of the cell when equilibrium is reached?_____

d. What will be the cell's Ψ_s value at equilibrium?_____

e. What will be the cells Ψ_p value at equilibrium?_____

IV. **A plant cell with a rigid cell wall is placed in a O.2M solution of NaCl at 270C and is allowed to equilibrate. Assume the cell has an initial osmotic potential of -8 bars and an initial pressure potential of +2 bars. Based on this information**

a. In which direction will there be net movement of water?_____

b. What will be the cell's water potential at equilibrium? _____

c. What will be the cell's ψ_s value at equilibrium _____

d. What will be the cell's Ψ_p value at equilibrium?_____

How does sugar or salt curing preserve meat? (The meat is placed in salt for a period of time.)