

# OSMOSIS WORKSHEET

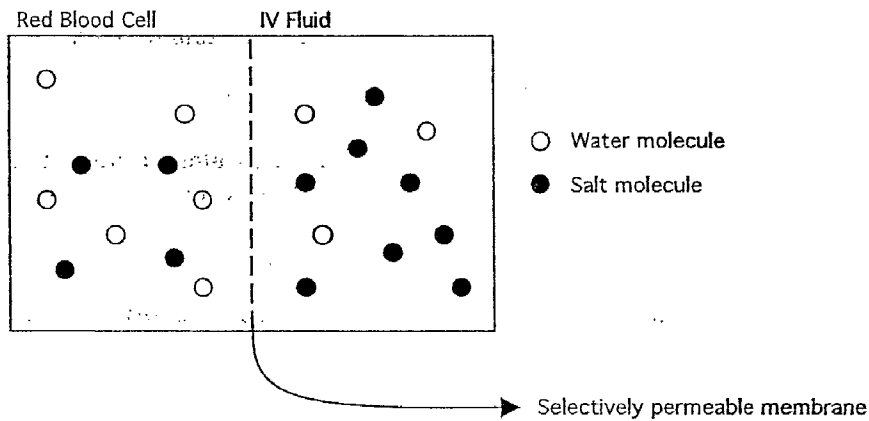
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Name: \_\_\_\_\_

Section: \_\_\_\_\_

Using the information you learned in lab, complete the following questions.

1. Below is a diagram of a red blood cell surrounded by intravenous (IV) fluid.



a) How many solvent molecules are in the red blood cell?

b) How many solute molecules are there in the IV fluid?

c) The membrane is permeable to water only.  
What direction (if any) will water move?

d) Is the IV fluid hypertonic, hypotonic, or isotonic to the red blood cell?

2. You have a red blood cell that contains 125 molecules of salt and 75 molecules of water. The IV fluid contains only 200 molecules of water.

a) What is the concentration of each solute in the cell. Show your calculations.

b) How many molecules of salt would you add to give the IV fluid a 25% solute concentration? Show your calculations.

c) With this new IV solution, what direction (if any) will water move and explain what will happen to the cell?

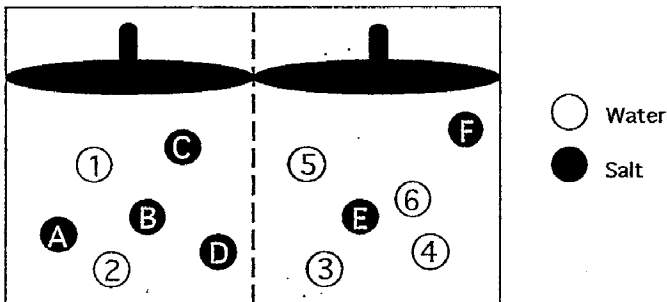
3. You have a red blood cell that contains 45 molecules of salt, 10 molecules of sugar, and 170 molecules of water. What is the concentration of each solute in the cell. Show your calculations.

4. You have a new red blood cell with the following composition:

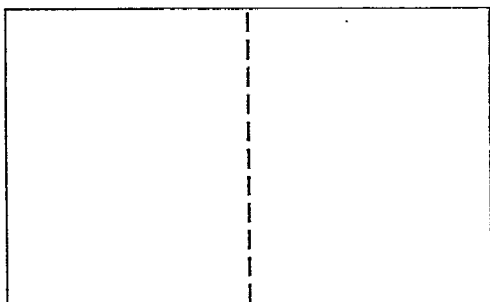
- 3% salt
- 1% protein
- 96% water

You want to make an IV solution that is isotonic to the cell using only salt and water. What percent of salt would you put into the solution? Explain and show your calculations. (Hint: See 'Part V: Two Solutes' in your lab manual)

5. The container below is divided by a selectively permeable membrane and has a plunger on each side that can move up and down in response to pressure. The solution has two types of molecules, water and salt. The membrane is permeable only to water (open circles with numbers), but not to salt (filled circles with letters).



- a) In the diagram below, draw the system as it might look when it reaches equilibrium. Don't forget to label the molecules and indicate any pressure changes. Then explain the drawing in the space provided.



- b) In the diagram below, draw the system as it might look some time after it reaches equilibrium. Then explain the drawing in the space provided.

