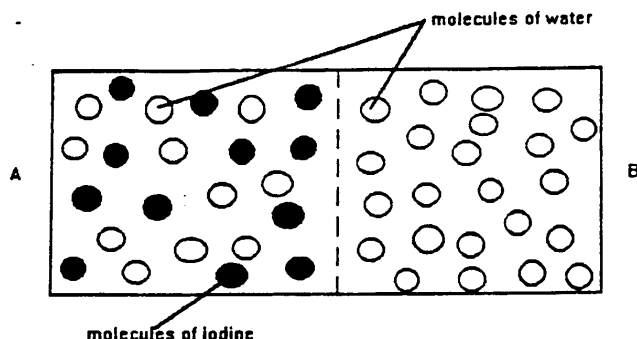


# Cell Transport

**Part I:** Two sides of a container are separated by a membrane permeable to both water and iodine.

## BEGINNING OF THE EXPERIMENT:

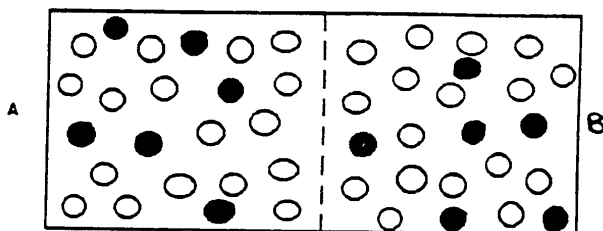


The left side of the membrane contains solution of water ( $H_2O$ ) and iodine (KI).

The right side of the membrane contains pure water.

- The picture below shows the apparatus after it is allowed to sit for a period of time.

## END OF THE EXPERIMENT



- In the illustration above, which substance (water or iodine) is the solute? \_\_\_\_\_
- Which substance is the solvent? \_\_\_\_\_
- In the top illustration, which side of the membrane (left or right) shows a true solution – meaning it has both a solute and a solvent? \_\_\_\_\_

Fill out the following chart:

Number of Molecules at the Beginning of the Experiment	Number of Molecules at the End of the Experiment

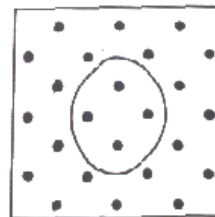
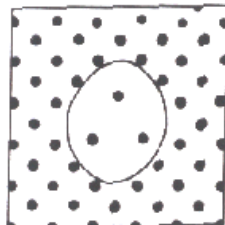
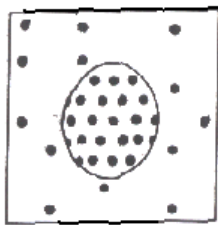
	Left Side	Right Side	Left Side	Right Side
Iodine				
Water				

- 5) Did diffusion take place during this experiment? \_\_\_\_\_ Which molecules (water, iodine) diffused during this experiment? \_\_\_\_\_
- 6) Describe the movement of water and iodine molecules during this experiment.
- In which direction did the iodine molecules diffuse? (left to right , right to left ) *circle one*
  - In what direction did the water molecules diffuse? (left to right, right to left ) *circle one*
  - Iodine molecules moved from an area of \_\_\_\_\_ (high, low) concentration of iodine to an area of \_\_\_\_\_ (high, low) concentration of iodine.
  - Water molecules moved from an area of high \_\_\_\_\_ (water, iodine) concentration to an area of low \_\_\_\_\_ (water, iodine) concentration.
  - Movement is always from \_\_\_\_\_ (high, low) to \_\_\_\_\_ (high, low).
  - Always compare movement of \_\_\_\_\_ (like, unlike) molecules.
- 7) At the beginning of the experiment (on the first page), the two sides of the apparatus have differences in the concentrations of solute particles. What is this difference called? \_\_\_\_\_
- 8) Does the movement of water or iodine in this experiment require energy other than the heat found naturally in the molecules? \_\_\_\_\_
- 9) What is another term for the type of transport that **does not** require metabolic energy (ATP)?  
(circle answer)                      **Passive transport**                      **Active transport**
- 10) Describe the concentrations of iodine and water molecules in the two sides of the container at the **end** of the experiment. \_\_\_\_\_

- 11) What term do we use to describe this condition? \_\_\_\_\_
- 12) At the end of the experiment, are molecules of iodine and water still moving? **Explain.**

## Part II

Label the pictures below ( isotonic, hypertonic, or hypotonic environments)



## Predicting the directions of osmosis

**IMPORTANT:** Concentrations can be expressed as high or low but we can also use **percent concentration**. If a solution of water and salt has 25% salt in it, it then has 75% water in it. Cells have many different types of solutes in them. A cell with 25% solute concentration will have 75% water in it.

*In the following situations, you are given the percent concentrations of solute inside and outside a cell.*

- I. Show the resulting direction of water movement (into the cell, out of the cell or equal movement in or out of the cell) in or out of the cell. **Your answer MUST be complete!** Use question #2 as a model.
- II. Identify the type of solution the cell has been placed into (isotonic, hypotonic or hypertonic).

2) A cell with 3% solute and 97% water is placed into a solution of 5% salt and water.

\_\_\_\_\_ % solute  
\_\_\_\_\_ % water

\_\_\_\_\_ % salt  
\_\_\_\_\_ % water

Water will move \_\_\_\_\_  
The cell will \_\_\_\_\_  
The solution is \_\_\_\_\_

3) A cell with 20% solute is placed into a solution of 80% water and 20% salt.

<div><div>_____ % solute</div><div>_____ % water</div></div>	<div>_____ % salt</div> <div>_____ % water</div>	Water will move _____
		<u>The</u> cell will _____
		The solution is _____

4) A cell with 95% water is placed into a solution of 80% water.

<div><div>_____ % solute</div><div>_____ % water</div></div>	<div>_____ % solute</div> <div>_____ % water</div>	Water will move _____
		<u>The</u> cell will _____
		The solution is _____

5) A cell with 99% water is placed into a solution with 10% oxygen and water.

<div><div>_____ % solute</div><div>_____ % water</div></div>	<div>_____ % O<sub>2</sub></div> <div>_____ % water</div>	Water will move _____
		<u>The</u> cell will _____
		The solution is _____