

Name: _____

Period: _____

Diffusion and Osmosis Worksheet

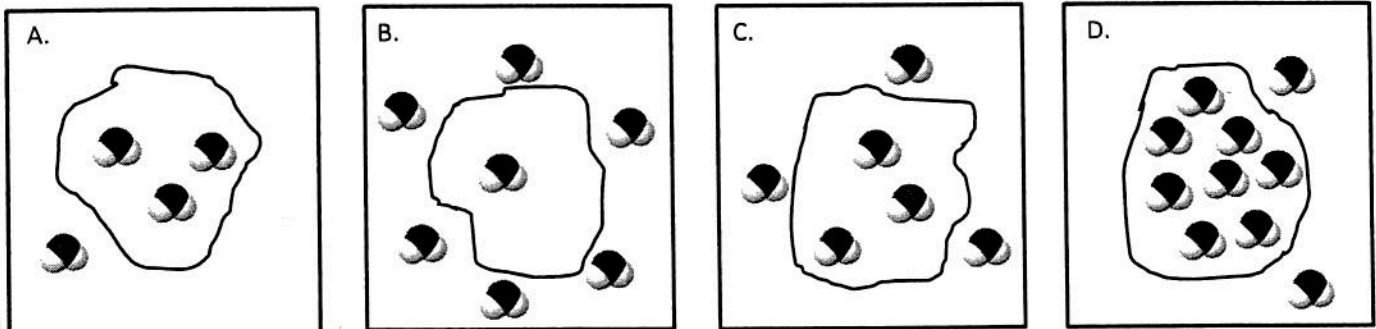
Despite their difference in size and shape, all cells are enclosed by a cell membrane that consists of a double layer of phospholipids interspersed with proteins. Its unique structure is described as selectively permeable because it permits some substances to cross it rapidly, while others are unable to cross it, or cross it slowly. Thus, the cell membrane regulates the substances entering and leaving the cell. There are three methods for passive transport of molecules through a cell membrane. **Passive transport** processes are ones that do not require cellular energy to proceed. A cell membrane that allows the passage of certain substances is said to be **semi-permeable**. For example, a semi-permeable cell membrane might not be permeable to certain large molecules, but might be permeable to oxygen and carbon dioxide, which means these molecules can pass freely across the membrane.

The force that propels oxygen, carbon dioxide, and other molecules across the membrane of the cell is called diffusion. **Diffusion** is defined as the movement of molecules from an area that is more concentrated (crowded) to an area that is less concentrated. The movement of water molecules across a membrane is a special kind of diffusion called **osmosis**. Osmosis typically occurs to balance the amount of salt found in the cell of the outside environment. When a red blood cell is placed in a very salty solution, water molecules will begin to flow out of the cell, causing the cell to shrink. **Facilitated diffusion** is the movement of molecules across the membrane with the aid of a transport protein from the cell membrane. Passive transport typically occurs until the number of molecules on either side of the membrane is equal.

1. What does it mean to be selectively or semi-permeable?
2. What is passive transport?
3. What are three types of passive transport that occur in the body?
4. What is facilitated diffusion? What structure assists with this process?
5. What is the overall goal of diffusion, osmosis, and facilitated diffusion?

Given the diagrams below (A-D) answer questions 6-10:

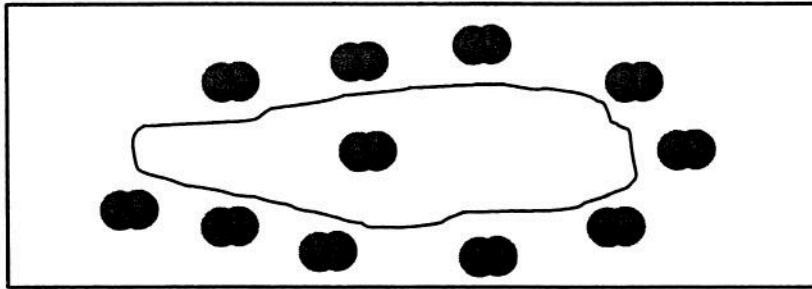
 = H₂O



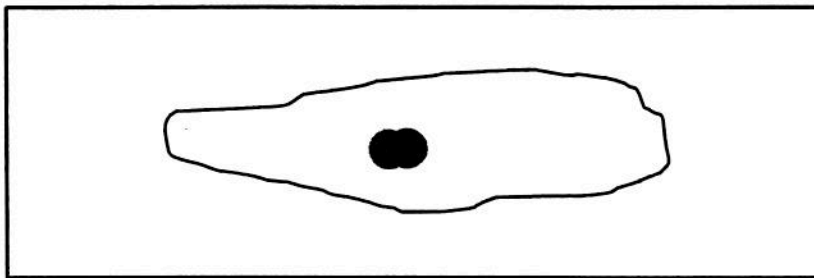
6. Which diagram(s) show that the cell will shrink? _____
7. Which diagram(s) show that the cell will swell? _____

8. Which diagram(s) show equilibrium in the cell? _____
9. All of the diagrams above are examples of a type of passive transport called?
10. A type of membrane that only allows certain materials to pass through is called?

Answer questions 11-14 using the diagram below:



11. Is the highest concentration of molecules inside or outside of the cell? _____
12. Draw the above cell in *equilibrium* with oxygen molecules.



13. What type of passive transport is displayed in the above diagram?
14. Oxygen is needed to produce energy in eukaryotic cells. Which organelle would you think needs oxygen the most?

Answer questions 15-17 using the information below:

Salt water has 95% water and 5% salt. Fresh water has 98% water and 2% dissolved substances.

15. If you were lost at sea and you drank salty seawater, what would you expect to happen to the cells in your body? (shrink, swell, or stay same size) Why do you think that?
16. A large-mouth bass is taken from a fresh water lake and transplanted into the river. If the conditions for survival are optimal, would you expect the cells in the fish to shrink, swell, or stay the same? Why do you think that?
17. If a sea star egg is taken from the ocean and put into Elk Lake would you expect the egg to shrink, swell, or stay the same? Why do you think that?