

Biology 12 - Cell Membrane & Transport – Review Worksheet

⇒ **Part A:** Definitions: Define the following terms, **IN YOUR OWN WORDS, IN AS FEW WORDS AS CLARITY ALLOWS.**

i. cell membrane	the liquid that dissolves the solute in a solution
ii. diffusion	the pressure of water moving across membranes caused by a concentration gradient.
iii. concentration gradient	solution that has same concentration of solute as the cells it surrounds
iv. solute	the solid that is dissolved in a solution
v. solvent	phospholipid and protein covering of every cell, controls what goes in and out of each cell
vi. osmotic pressure	movement of molecules from region of greater concentration to region of lesser concentration.
vii. isotonic solution	solution that has lesser concentration of solute as the cells it surrounds. Will cause cells to burst
viii. hypertonic solution	solution that has greater concentration of solute as the cells it surrounds. Will cause cell to shrink
ix. hypotonic solution	hydrostatic pressure due to a plant cell being placed in hypotonic solution. Is pressure on inside of plant cell against the cell wall.
x. plasmolysis	the difference in concentration between two regions
xi. turgor pressure	shrinking of a plant cell (wilting) due to being place in a hypertonic solution.
xii. facilitated transport	. cell drinking” Endocytosis of small particles (small enough that an electron microscope is needed)
xiii. crenation	Current model of membrane structure. A phospholipid fluid sea is embedded with a wide variety (“mosaic”) of protein molecules.
xiv. active transport	Carrier-mediated transport that works against the conc. gradient and requires energy.
xv. endocytosis	Carrier-mediated transport that works with the conc. gradient and requires no energy
xvi. phagocytosis	endocytosis of large particles (large enough to be seen with light microscope)
xvii. pinocytosis	opposite of endocytosis. Vesicle inside cell fuses with cell membrane, depositing contents on the outside.
xviii. exocytosis	shrinking of animal cells placed in hypertonic solutions.
xix. glycolipid	“Cells bringing in materials by forming vesicle around substance outside the cell with the cell membrane.
xx. Fluid Mosaic Model	carbohydrate attached to phospholipid on cell membrane. Often serves in cell identification and communication.

PART B - SHORT ANSWERS

- Diffusion is the movement of molecules from the area of _____ concentration to the area of _____ concentration.
- Osmosis is the movement of water across a selectively permeable membrane.
- A cell is isotonic to a solution of 0.01% sugar.
 - What concentration would be hypertonic? _____
 - What concentration would be hypotonic? _____
- What happens to an animal cell in a hypotonic solution?
 - What happens to an animal cell in a hypertonic solution?
- Turgor pressure is best exemplified by placing a plant cell in a _____ solution
- Give an example:
 - of diffusion in the body _____
 - of facilitated transport _____
 - of active transport _____
- List 3 ways in which active transport differs from the process of diffusion across a cell membrane.

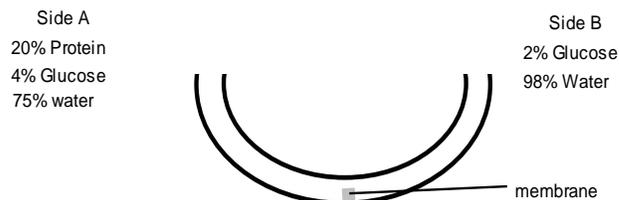
8. List 2 ways in which facilitated transport differs from active transport.

9. Within each of the three pairs, choose the more concentrated solution:

Pairs		Answer
a. 80% water, 20% starch	b. 90% water, 10% starch	
a. 5 g NaCl, 50 g water	b. 5 g NaCl, 25 g water	
85% solvent, 15% solute	75% solvent, 25% solute	

10. Consider this diagram.

- Will the concentration of water stay the same on side A or become greater or less with time?
- Will the concentration of protein on side A stay the same or become greater or less with time?
- Glucose will cross the membrane in which direction?
- On which side will the hydrostatic pressure increase?
- What will happen to the level of the solution on each side?



- Red blood cells neither gain nor lose water when put into 0.9% NaCl.
 - What term would you use to describe the tonicity of 0.9% NaCl for Red blood cells?
 - Are the solutions below hypertonic or hypotonic to red blood cells?
 - 15% NaCl
 - 0.001% NaCl
- A scientist notes that of three monosaccharides -- glucose, mannose, and galactose -- glucose enters cells much faster than the other two. What process is at work?
- Answer true or false:

a. If a plant cell is placed in salt solution, the central vacuole will shrink	
b. If a red blood cell is placed in distilled water, it will shrink	
c. If a plant cell is placed in distilled water, the cell membrane will move away from the cell wall	
d. If a red blood cell is placed in a salt solution, salt will enter the cells, giving them a strange appearance	
e. Crenation is to plasmolysis as hemolysis is to turgor pressure	
- A small lipid molecule passes easily through the cell membrane. Which of these statements is the most likely explanation?
 - a protein carrier must be at work
 - the cell membrane is partly composed of lipid molecules
 - the cell is expending energy to do this
 - phagocytosis has enclosed this molecule in a vacuole
- Which of these does not require an expenditure of energy?
 - diffusion
 - osmosis
 - facilitated transport
 - none of these require energy
- The thyroid gland contains a high concentration of iodine. This is an example of
 - passive transport
 - active transport
 - facilitated transport
 - endocytosis
- Cell drinking is synonymous with
 - cell eating
 - endocytosis
 - phagocytosis
 - pinocytosis
- If a cell uses active transport to take in salts, then osmosis will follow and water will enter the cell
 - true
 - false
- Which of the following substances would be taken into a cell by phagocytosis?
 - dissolved gases
 - proteins
 - simple sugars
 - steroid lipids
- An animal cell will always take in water when placed in a
 - hypertonic solution
 - hypotonic solution
 - isotonic solution
 - osmotic solution