Bio I

Study Guide: Cellular Transport

- The cytoplasm of *Elodea* cells is composed of about 70% water molecules and 30% othr kinds of molecules.

Read the three examples given below:

a. *Elodea* cells are put into a liquid that is 50% water

b. *Elodea* cells are put into a liquid that is 70% water.

c. *Elodea* cells are put into a liquid that is 100% water.

Study the predictions below and select the example above that matches the prediction.

_____ 1. The *Elodea* cells in the liquid will shrink.

_____ 2. The *Elodea* cells in the liquid will swell.

_____ 3. The *Elodea* cells will not change in size.

- The diagram below shows a cellophane bag containing molasses. The bag is in a beaker of water. An open glass tube extends from the bag. The molasses comes up a short distance in the tube.

Use the diagram to answer the questions.

_____ 1. Movement of water molecules across the membrane is the result of

a. osmosis

b. the glass tube

c. active transport

d. air pressure

_____ 2. After 24 hours, the size of the cellophane bag will probably be

a. smaller

b. larger

c. the same

_____ 3. After 24 hours, the beaker will contain

a. water only c. both water and molasses

b. molasses only d. neither water nor molasses

_____ 4. After 24 hours, the cellophane bag will contain

a. water only c. both water and molasses

b. molasses only d. neither water nor molasses

- *Study the diagrams showing a beaker containing water and a salt solution separated by a permeable membrane. Draw stage 3. Then answer the questions in the spaces provided.*

1. Why do the salt molecules move to the left side of the beaker?
2. What do you think the relationship between salt molecules and water molecules on each side of the beaker would be after four hours?
3. What is this process called?

- *Answer the questions below.*

1. How is osmosis related to diffusion?
2. What does the term semipermeable or selectively permeable mean?
3. Define the following terms: hypertonic, hypotonic, and isotonic
4. If you were to dissolve some sugar in a liter of water and then place some of this solution into a dialysis bag; then place the bag into a beaker of distilled water, what would happen to the size and weight of the bag of sugar water?
5. Explain the mechanism of what happened to the bag explained above using the terms, hypertonic, hypotonic or isotonic.

6. Diagram the above procedure and then explain what you would have to do to reverse the process.
7. Why do saltwater fish die when placed in freshwater? Explain your answer.
8. What is phagocytosis? Diagram this process below.
9. What is pinocytosis? Diagram this process below.
10. You have a solution of 50% NaCl (salt solution) and 50% H_2O. Which is the solute? The solvent?

- *Determine if the cell is hypotonic, hypertonic or isotonic to the solution it is submerged in.*

1. The cell contains 68% water, 2% salt, and 30% other materials. The solution it is found in contains 70% water, 3% salt, and 27% other materials. What type of solution is this?
    - Draw a diagram that best represents the above situation. Be sure to use arrows to show the movement of water.

2. The cell contains 78% water, 2% salt, and 20% other materials. The solution it is found in contains 75% water, 3% salt, and 22% other materials. What type of solution is this?
    - Draw a diagram that best represents the above situation. Be sure to use arrows to show the movement of water.

- *Label the following diagrams as hypertonic, hypotonic or isotonic. Draw arrows to show the movement of water and explain your answer.*