

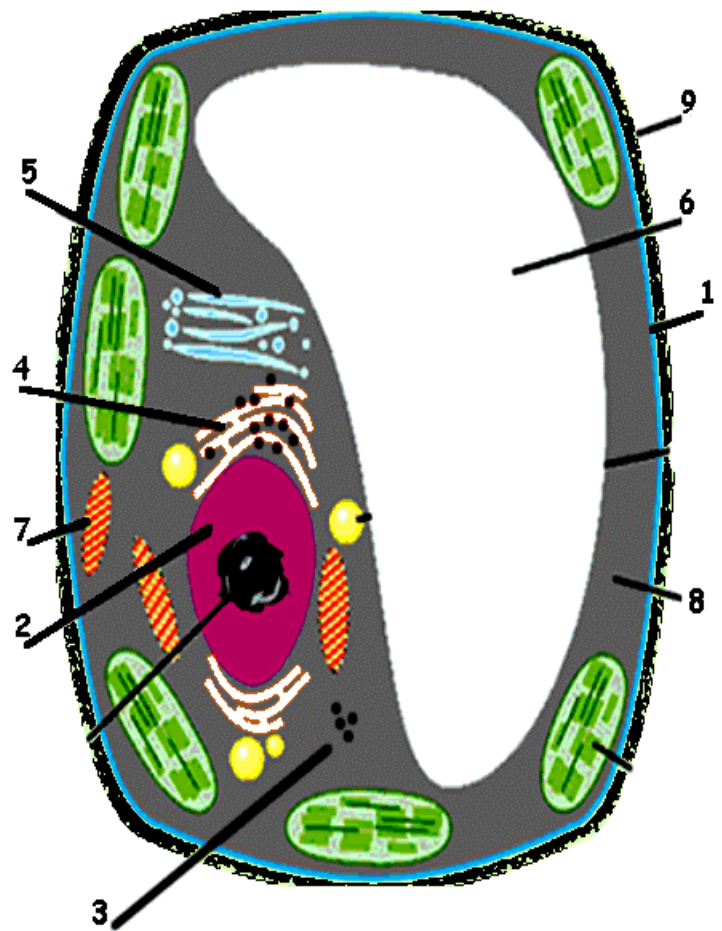
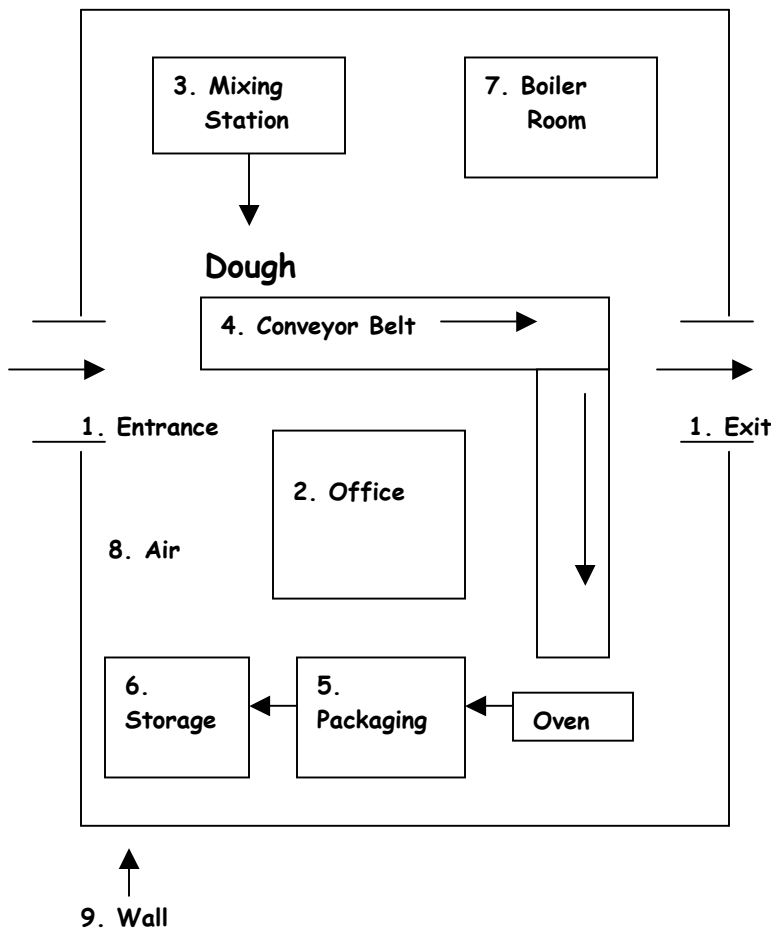
ANALOGY-THE CELL IS LIKE A FACTORY

I. Similarities of Structures and Functions

- a. **Directions:** study the diagrams below. Note that each numbered structure in the factory and in the cell perform similar functions. Identify the factory structures and state their functions. Next identify the cell structure.

Bread Factory

Cell



Complete the table on the following page according to the parts of the bread factory and the cell.

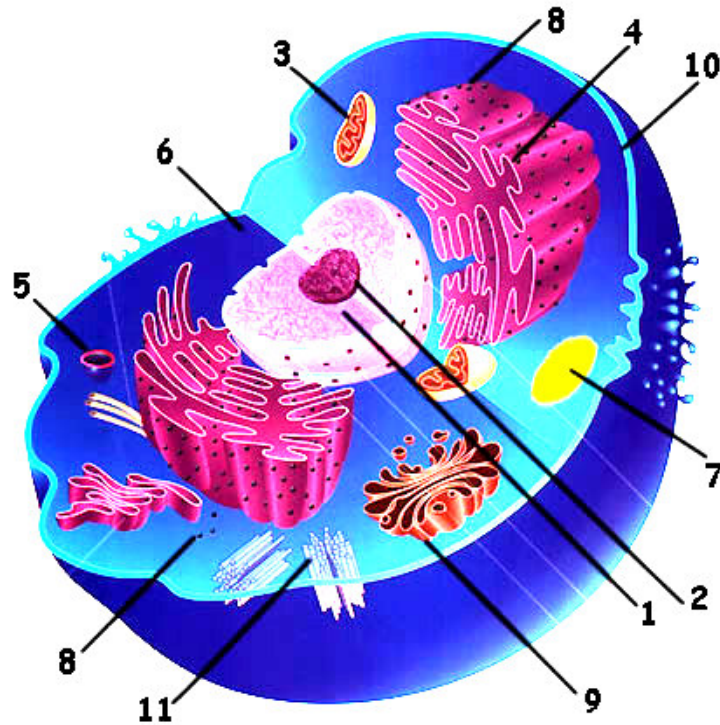
<u>Factory Structure</u>	<u>Cell Part</u>	<u>Function</u>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

Assume that the factory above is a bread factory and that the cell is a typical animal cell, explain the statement: "Both the bread factory and the animal cell have many different parts that function as a unit."

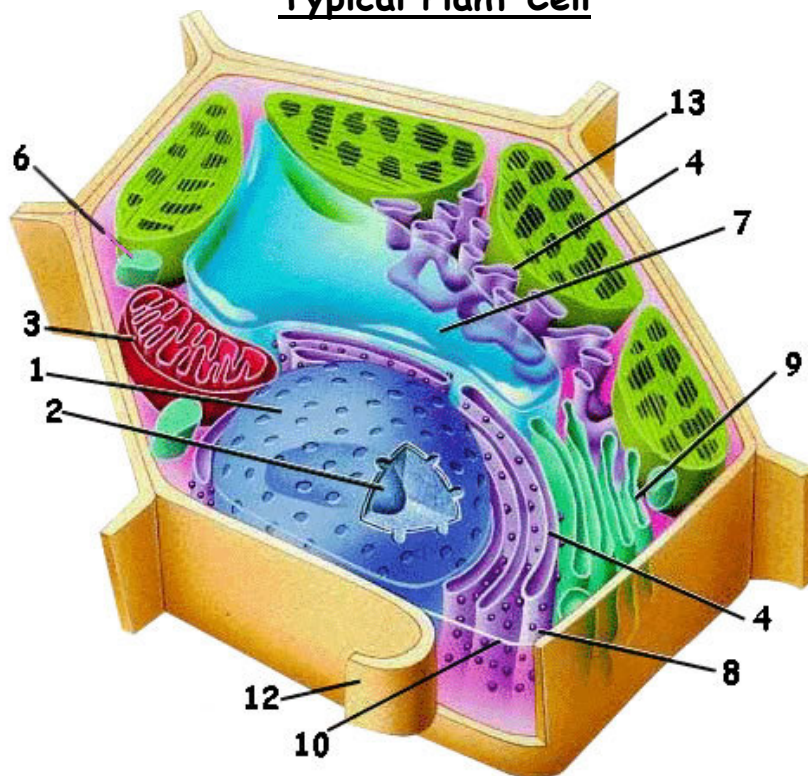
Parts and Functions Of a Typical Plant Cell and Animal Cell

I. With the aid of your textbook identify and label the structures in a typical animal cell and plant cell.

Typical Animal Cell



Typical Plant Cell



a. Complete the table below for the structures and functions of a typical animal cell.

Organelle	Location	Function
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10		
11.		
12.		
13.		

b. Identify the two organelles that are found only in a typical plant cell.

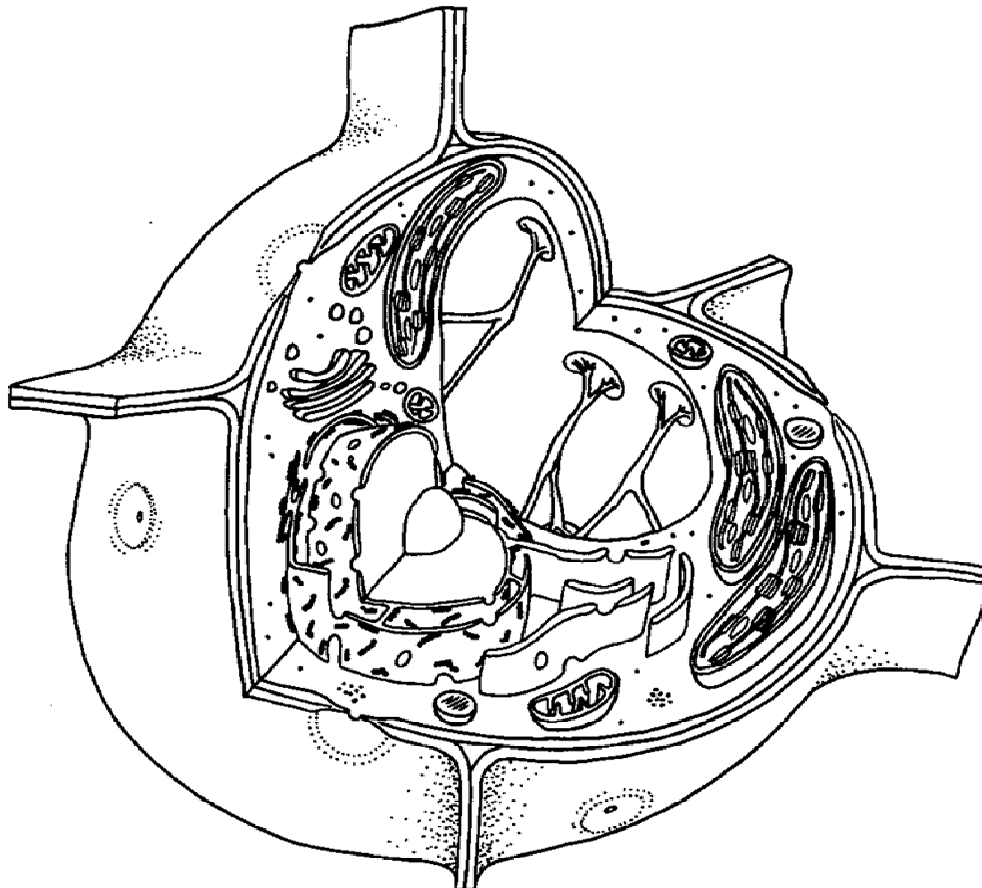
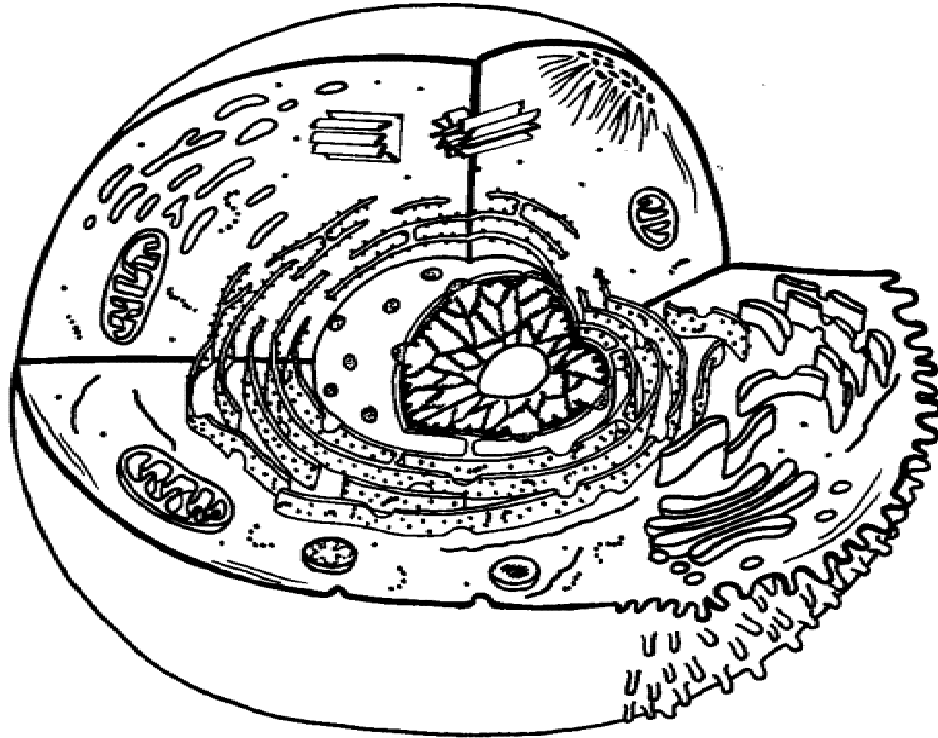
Organelle	Location	Function
A.		
B.		

- 1. List the organelles common to both the plant cell and the animal cell.**
- 2. List the organelles found only in the animal cell.**
- 3. List the organelles found only in the plant cell.**
- 4. In terms of cellular structure, explain why plants do not have to ingest nutrients and do not carry on the function of locomotion (being able to move from place to place).**
- 5. Explain why both the plant and animal cells carry on the life function of respiration but only plant cells carry on the function of photosynthesis.**

Plant Cell vs. Animal Cell

Directions: Color the parts of the plant cell and animal cell according to the guidelines below.

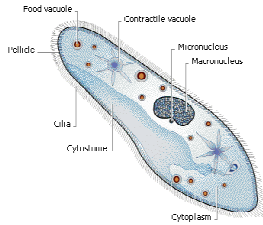
Cell Membrane - Navy blue, Vacuole - yellow, Nucleus - red, Nucleolus - pink,
Nuclear Membrane - purple, Lysosome - orange, Mitochondria - maroon, Golgi Body - baby blue,
Ribosome - brown, ER - black, Cytoplasm - peach, Centrioles - gray, Cell Wall - dark green,
Chloroplast - light green



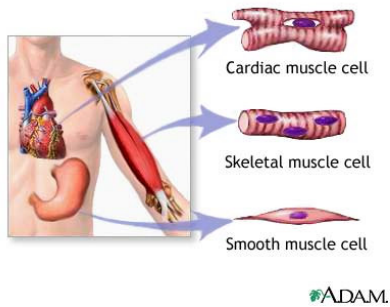
Differences In Organization

Directions: Explain the differences in each of the following:

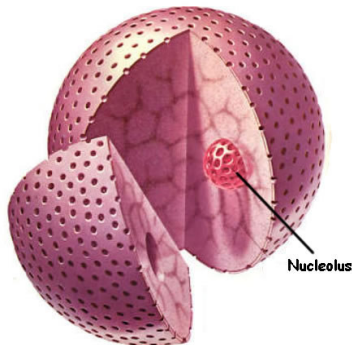
A. Unicellular (Paramecium) -



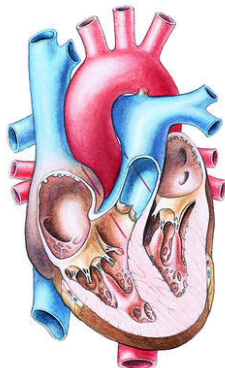
B. Multicellular (Man) -



C. Organelle (Nucleus) -



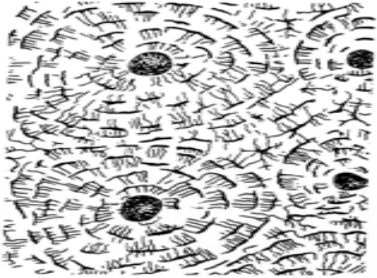
D. Organ (Heart) -



Cells as Units of Functions

Directions: List the function of each different cell.

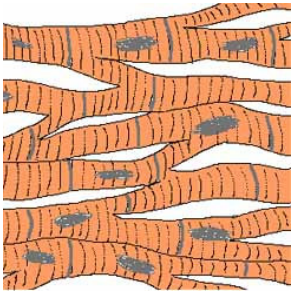
A. Bone Cell -



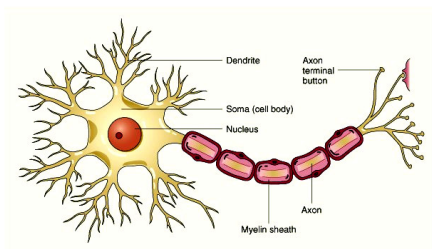
B. Red Blood Cell -



C. Muscle Cell -



D. Nerve Cell -



Structure and Composition of The Cell Membrane

I. Structure of The Cell Membrane

A. Demonstrations:

1. Analogy of the sieve:

Observe the demonstration with the sieve. Record and explain your observations.

2. Demonstration of the dialysis bag:

Observe the demonstration of the dialysis bag on the front desk. Record and explain your observations before and after.

3. Demonstration of bean seeds:

Observe the dry seed and the seed that has been soaked in water. Record and explain your observations.

4. Conclusion: All of the above demonstrations apply to the cell or plasma membrane. Based on these demonstrations make an inference or logical conclusion. Use your observations to support your conclusion.

a. Define the following terms:

Semi:

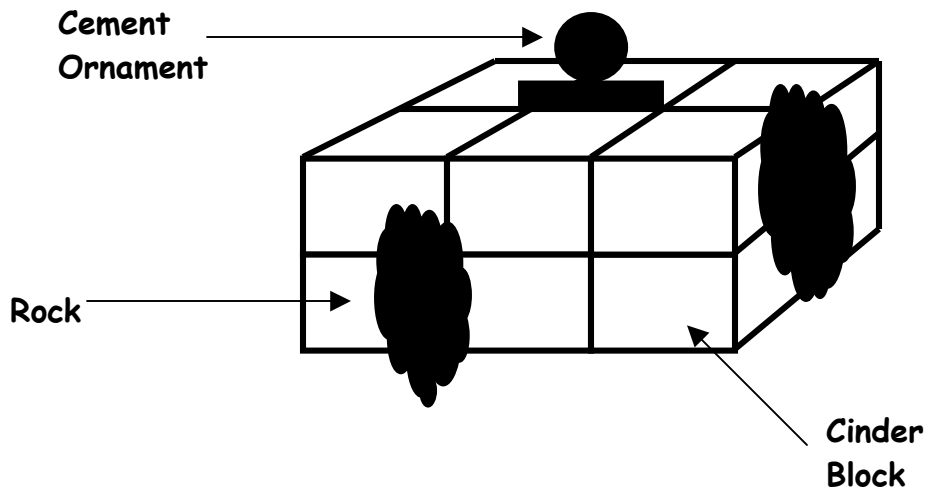
Permeable:

Semipermeable:

II. Composition of The Cell Membrane

A. Analogy of The Cinder Block Wall

Study and describe the diagram below of the cinder block wall.
Answer the questions that follow.

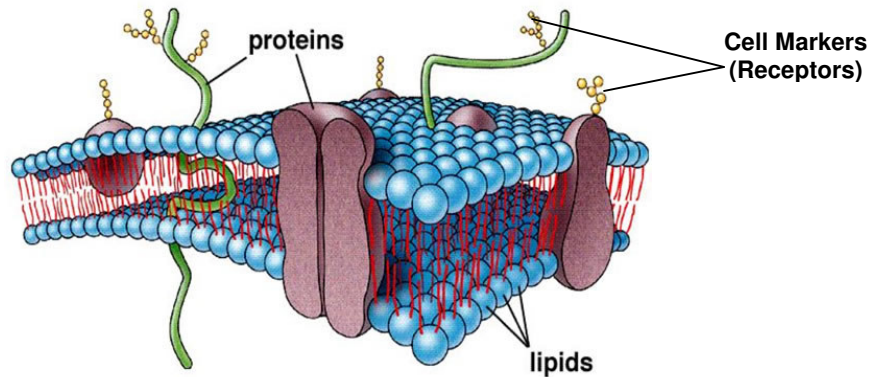


1. What is the chemical makeup of the cinder block? Rock? Cement Ornament?

B. Composition - Chemical Makeup of The Cell Membrane

Study the labeled diagram of the cell membrane below and answer the following questions.

Small Portion of a Plasma Membrane



1. Describe what you see in the cell membrane above.
2. Identify the part of the cell membrane that corresponds to the cinder block wall.

Cinder Block = _____

Rock = _____

Cement Ornament = _____

3. Indicate the number of layers of:

Phospholipids (lipids) _____

Proteins _____

Cell Markers (Receptors) _____

4. Based on the above, write a statement that summarizes the chemical composition of the cell membrane.

Cellular Transport

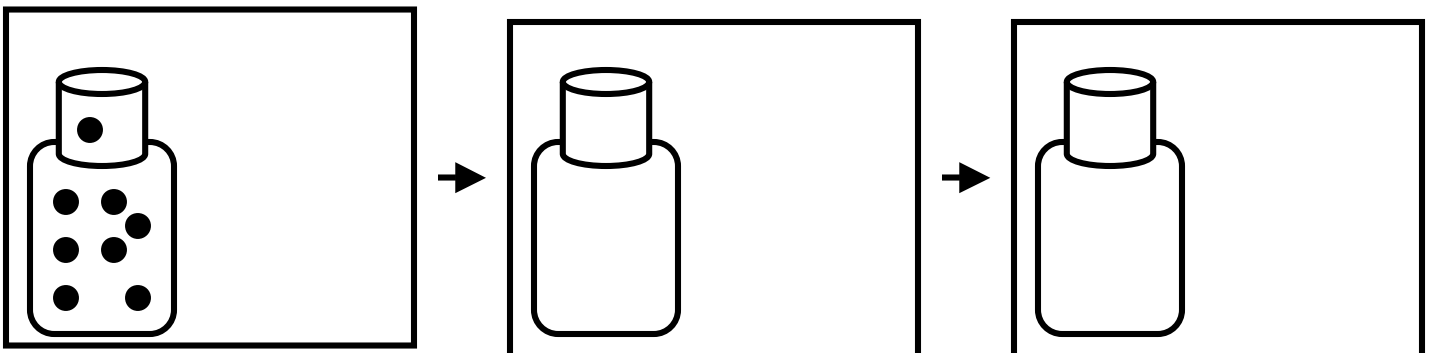
I. Major Types of Transport

A. Passive Transport

Draw a picture of a ball rolling down a hill.

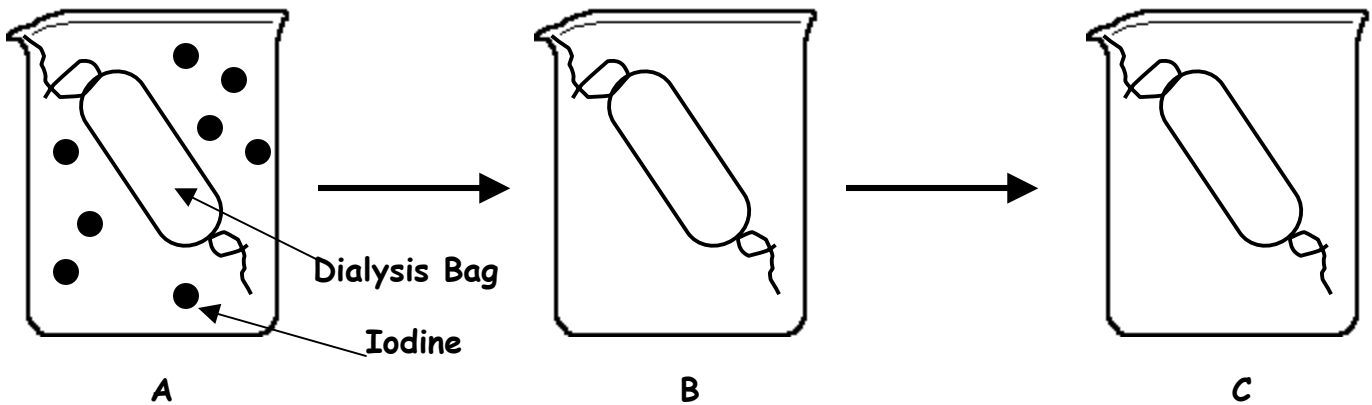
1. What makes the ball roll down the hill?

2. Study the diagram of a sealed room with a bottle of opened perfume. Assume that there was a small amount of perfume that vaporized into 8 molecules that are represented by small black circles. Draw the sequence of the movement of the molecules out of the bottle over time until there are no more molecules in the bottle.



Room

3. Recall the dialysis bag demonstration. If the black circle represents a molecule of iodine, draw the molecules of iodine over time in each of the sequential beakers.

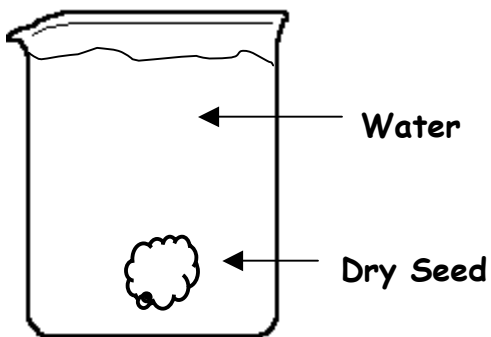


- a. At the start of the demonstration the concentration of iodine was higher in the _____ and lower in the _____.
- b. In terms of concentration, which direction did the iodine molecules move? Explain.
- c. Describe the location of the molecules at equilibrium.
- d. Define:
1. Diffusion:

4. Recall your observations of the dry pea seed that were soaked in a beaker of water.

a. At the time that the seeds were placed in water, the concentration of water was higher in the _____ and lower in the _____.

b. In terms of concentration, which direction did the water molecules move?

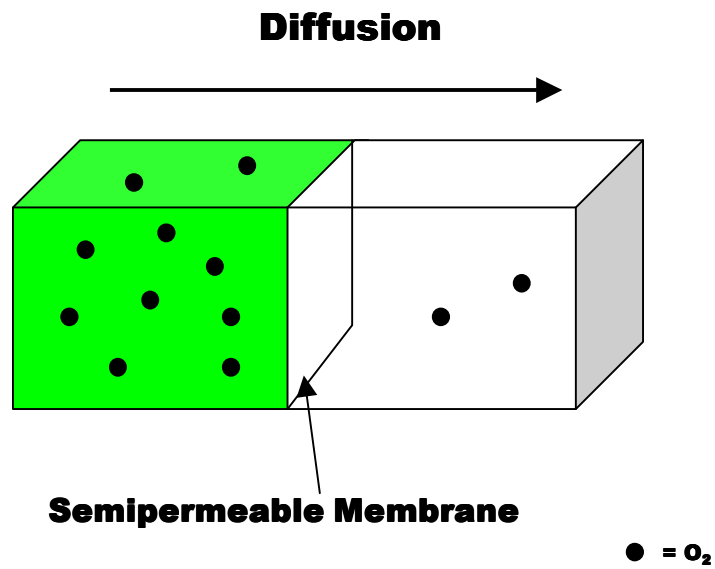


c. Define:

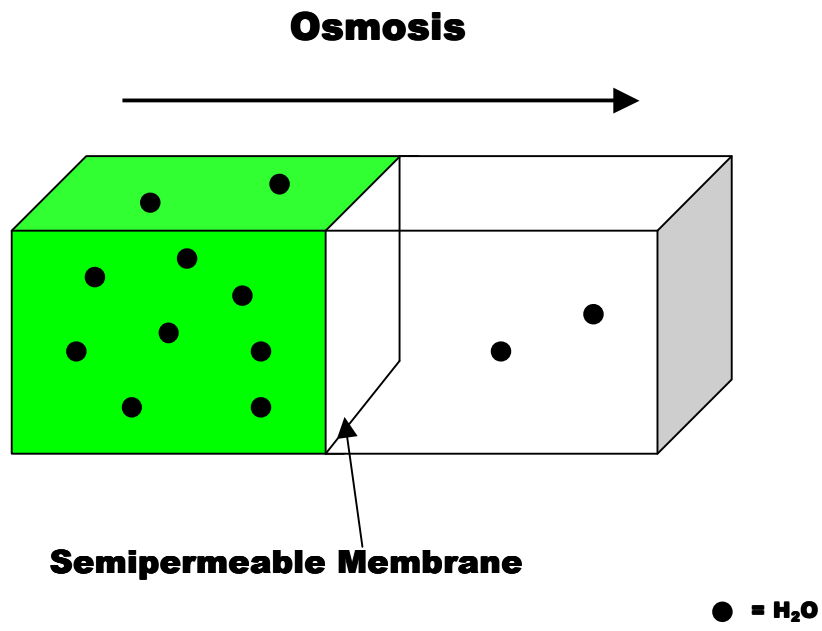
2. Osmosis

Your definition must include the following terms: high water concentration, low water concentration, and semipermeable membrane.

5. Observe the following diagrams and answer the questions below.



- a. Draw a diagram, similar to the above diagram, that represents diffusion taking place.



- d. Draw a diagram, similar to the above diagram, that represents osmosis taking place.

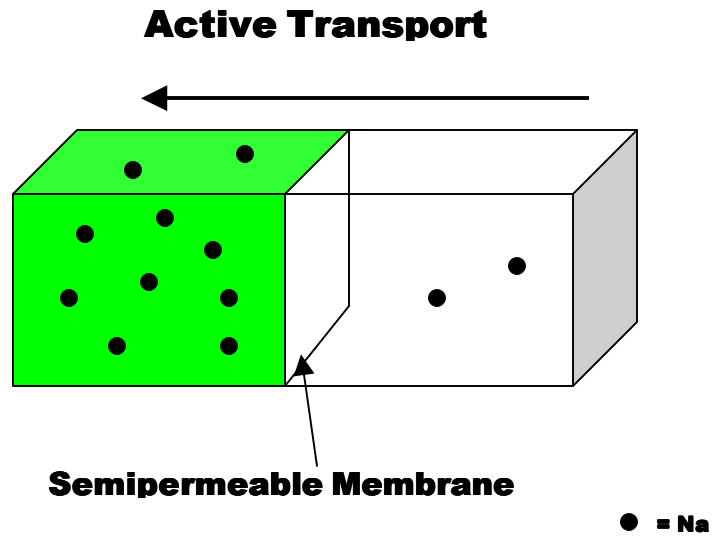
6. Define:

- Passive Transport

B. Active Transport

Draw a picture of a ball going back up the hill.

- 1. Can the ball get up the hill by itself?**
- 2. Explain how you would get the ball up the hill.**
- 3. In terms of hilltop (high) and flat ground (low) in what direction did the ball move to get up the hill?**



- a. Draw a diagram similar to the above diagram that represents Active Transport taking place.

4. Define:

- Active Transport

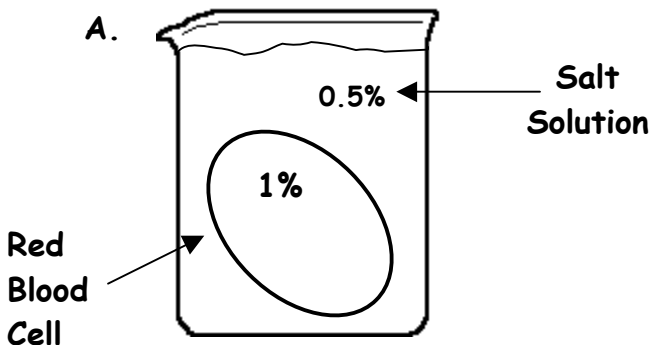
Problem Solving

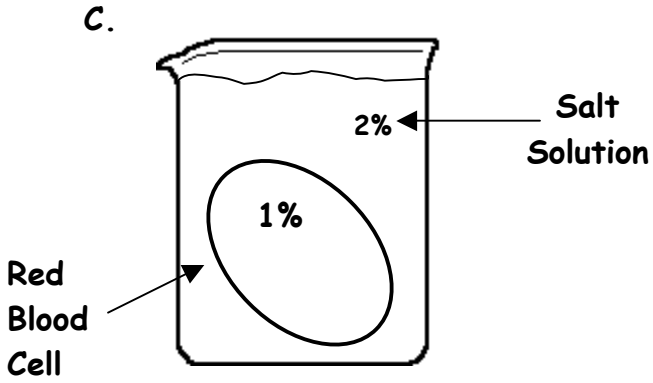
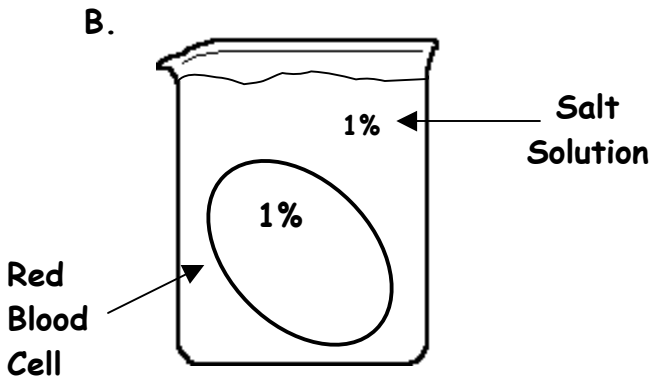
I. Steps in problem solving:

- A. Study diagram or read the problem.
- B. Underline the two different % solutions.
- C. Determine which % solution has more water. Recall the lower the %, the more water concentration. (i.e. 5% salt = 95% water, 10% salt = 90% water)
- D. Write the appropriate word, **HIGH**, **LOW**, or **SAME**, to identify the concentration of water in % solution.
- E. Draw an arrow to indicate the direction of movement of water.
- F. Indicate the results if the cell "*swelled*", "*shriveled*", or "*remained the same*".

II. Sample Problems

Below are 3 diagrams of a red blood cell placed in a beaker of different salt concentrations. Note that the red blood cell has an internal concentration of solutes (dissolved substances) at 1%. That means the concentration of water is equal to 99%. Follow the steps above to solve the following problems.

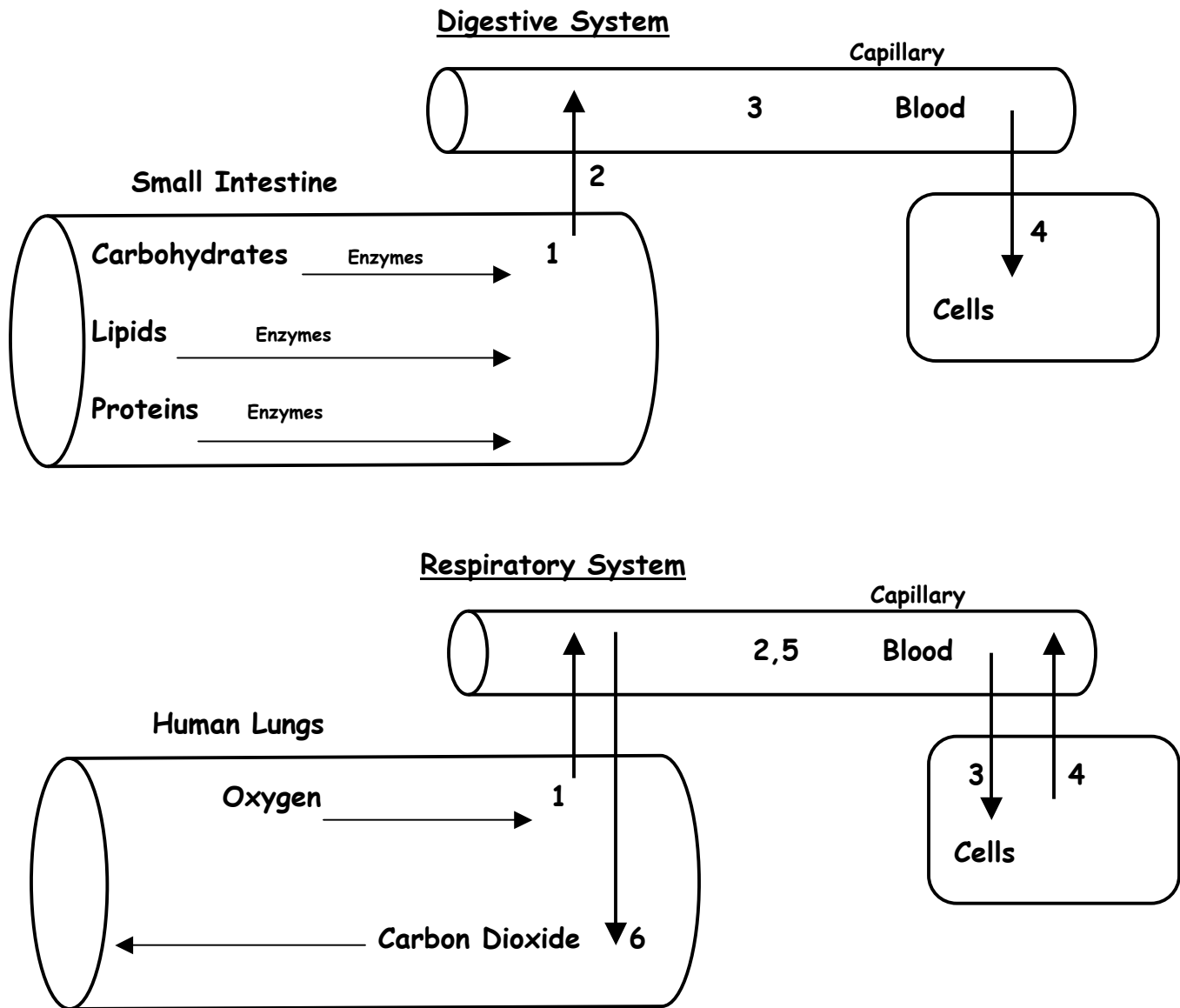




Explain:

a. All the above involve passive transport (osmosis).

Diffusion in the Human Body



1. Explain why chemical digestion is necessary.
2. Explain how the molecules are absorbed into the blood and how they enter the cell in both the digestive and respiratory systems.

Cytology Homework Questions

Directions: Answer all questions on a separate sheet of loose-leaf paper. Use your textbook, class notes, and/or my website to define terms and answer the questions.

1. Explain why the bone cell is the basic unit of structure and function of the skeletal system.
2. State the differences between:
 - a. A typical plant and a typical animal cell
 - b. A prokaryotic and eukaryotic cell
 - c. Cell membrane and cell wall
 - d. Vacuole and stomach
 - e. Skin cell and paramecium
3. In terms of organelles, explain why plants are autotrophs.
4.
 - a. Explain how a dialysis bag is similar to a cell membrane.
 - b. Describe the structure and chemical makeup of the cell membrane.
5. Compare active and passive transport
 - a. Examples
 - b. Definitions
 - c. Direction of molecular movement
 - d. Establish equilibrium
 - e. Types of molecules
 - f. Requires energy
6. State the differences between diffusion and osmosis.
 - a. Describe an example of diffusion in the human body.
7. Explain the relationship between the cell membrane and passive transport.
8. Assume you are in a rowboat that begins to leak. If you could not patch the leak, what would you do to stay afloat
 - b. An amoeba is a freshwater, unicellular organism. If the amoeba were placed on a distilled water wet mount, describe what you would expect to observe under a microscope.
 - c. Describe your observations if it were placed in a salt water solution.