Unit 1 District Assessment Review

Macromolecules

1. What structural difference explain why lipids provide more energy to a cell than an equal mass of proteins or carbohydrates?
A. Lipids have more carbon-hydrogen bonds per gram than proteins or carbohydrates
B. Lipids have more nitrogenous bases per gram than proteins or carbohydrates
C. Lipids have more amino acids per gram than proteins or carbohydrates
D. Lipids have more simple sugars per gram than proteins or carbohydrates

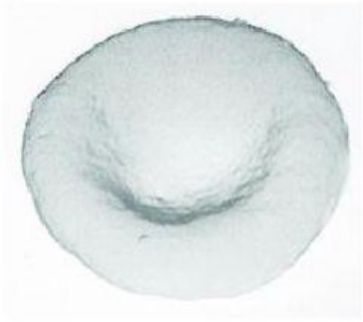
2. Use the table to answer the question.

Which two students correctly described organic compounds in the table above?
A. Students 1 and 2
B. Students 2 and 3
C. Students 3 and 4
D. Students 2 and 4

Students' Descriptions of Four Organic Compounds

Student	Organic Compounds	Description
1	carbohydrates	complex compounds made of purines and pyrimidines that function as data-storage molecules
2	lipids	use the relatively high energy contained in carbon-hydrogen bonds to perform their primary function
3	proteins	chains of amino acids that can function as enzymes, hormones, or antibodies
4	nucleic acids	compounds, produced by photosynthetic plants, that contain only carbon, hydrogen, and oxygen

3. The picture below shows a red blood cell made up of a protein molecule called hemoglobin.



Protein molecules, like the one in the picture, can be broken down into smaller components called
A. monosaccharides, or simple sugars.
B. fatty acids.
C. amino acids.
D. polysaccharides, or complex sugars.

4. The function of the nucleic acids contained in the body cells of an organism is
A. directing the synthesis of proteins necessary for proper cell function.
B. producing the inorganic molecules needed for normal cell growth.
C. disrupting meiosis and the synthesis of amino acids into a sequence.
D. forming a variety of gametes that will pass on hereditary information.

5. What is the role of carbohydrates in animal cells?
A. synthesizing proteins
B. developing enzymes
C. storing energy
D. protecting the cell wall

Enzymes

1. The diagram below shows how living things use enzyme in chemical reactions to release energy.



How do enzymes affect the reactions in which they take part?
A. Most enzymes slow down chemical reactions.
B. Enzymes are converted into products in the reaction.
C. Enzymes increase the activation energy of the reaction.
D. Enzymes decrease the activation energy of the reaction.

2. Enzymes help living organisms metabolize food. Typically, an enzyme acts to
A. slow down a metabolic reaction, which prevents the organism from using energy too quickly.
B. maintain a metabolic reaction, which causes the organism to lose energy as it takes in food.
C. transform a metabolic reaction into an oxidation reaction, providing the organism with oxygen.
D. speed up a metabolic reaction, which allows the organism to get energy quickly.

Cell Organelles

1. Which describes an interaction between the Golgi apparatus and another organelle to maintain a cell's homeostasis?
A. The Golgi apparatus stores nutrients provided by the mitochondria.
B. The Golgi apparatus sorts and packages proteins created by ribosomes.
C. The Golgi apparatus collects genetic information to be used by the nucleus.
D. The Golgi apparatus sends and receives chemical signals for the membrane.

2. In a cell, the information that controls the production of proteins must pass from the nucleus to what other cell structure?
A. mitochondrion
B. cell membrane
C. chloroplast
D. ribosome

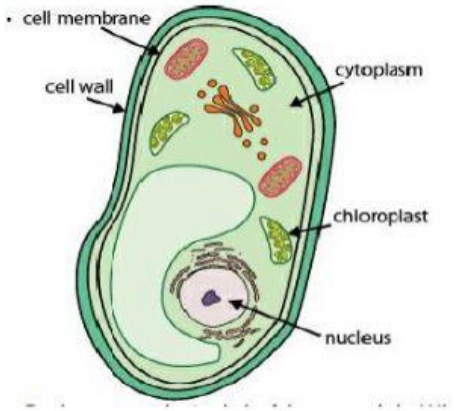
3. An environmental toxin is discovered that interferes with certain cellular functions. When affected cells are examined, it is observed that proteins are normally found in the plasma membrane are instead found in the cytoplasm. Other proteins are also located improperly. Which structure is most likely affected by the toxin?
A. Lysosomes
B. Mitochondria
C. Cell Wall
D. Golgi apparatus

4. Hemoglobin is a protein found in the red blood cells of vertebrates and in the plasma of many invertebrates. The function of this protein is to transport oxygen throughout the body and to bring carbon dioxide back to be expelled from the organism. If the amino acid sequence of the protein is altered, the mutated protein is not as efficient at carrying oxygen as is the normal hemoglobin. Which argument is supported by this information?
A. The mutated hemoglobin protein can still carry carbon dioxide to be expelled from the organism.
B. Hemoglobin must be a simple molecule because it is found in both vertebrates and invertebrates.
C. Structural changes of hemoglobin affect its ability to carry oxygen, indicating that the shape of a protein is important to its function.
D. Normal hemoglobin must be a larger molecule than the mutated hemoglobin since it has sufficient space to attach to and carry both oxygen molecules and carbon dioxide molecules.

Plant and Animal Cells

1. Mitchell is creating a model of a plant cell. Mitchell wants to include organelles that are involved in energy production for the cell. Which organelles should Mitchell include?
A. Mitchell should use mitochondria to store energy and cytoplasm to release energy from food.
B. Mitchell should include the nucleus to transform light energy and chloroplasts to store energy.
C. Mitchell should include cytoplasm to store energy and lysosomes to release energy from food.
D. Mitchell should include chloroplasts to transform light energy and mitochondria to release energy from food.

2. Sydney created a cell model for her science project as shown below. Sydney needs to label her model. Which statement BEST describes the type of model Sydney created?



A. Sydney has created a plant cell model because only plant cells contain chloroplasts and a cell wall.
B. Sydney has created an animal cell model because only animal cells contain a nucleus and a cell wall.
C. Sydney has created a plant cell model because only plant cells contain cytoplasm and a cell membrane.
D. Sydney has created an animal cell model because only animal cells contain chloroplasts and a cell membrane.

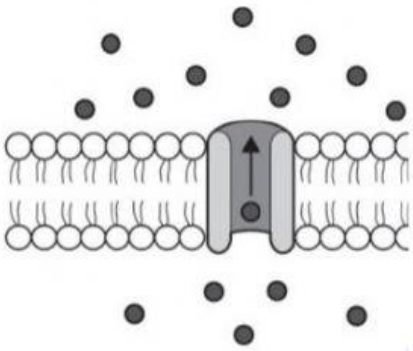
3. Which of the following are NOT found in both plant and animal eukaryotic cells?
A. vacuoles
B. nuclei
C. mitochondria
D. chloroplasts

4. Which term best completes the concept map below?
A. an animal cell
B. a prokaryotic cell
C. a virus
D. a plant cell

Plasma (Cell) Membrane

1. The diagram shows a selectively permeable membrane with an embedded channel protein Which statement best describes how embedded proteins help a plasma membrane perform its function?

A. They prevent waste material from leaving a cell.
B. They prevent water molecules from entering a cell.
C. They allow certain kinds of molecules to enter or leave a cell.
D. They allow substances dissolved in water to enter or leave a cell.



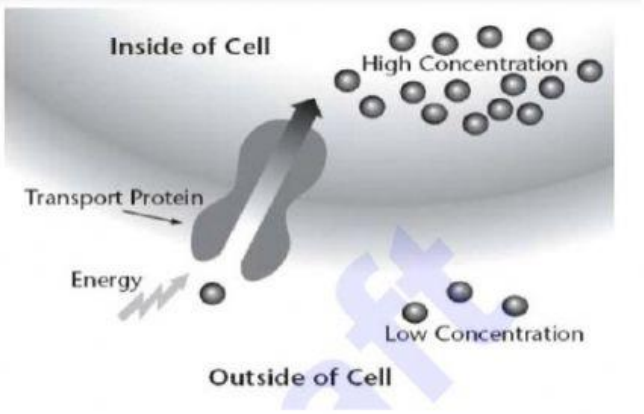
2. The fluid-mosaic model of the cell membrane suggests that the membrane is primarily composed of proteins and lipids. Which of the following is a function of proteins in the cell membrane?
A. to allow substances to cross the plasma membrane via active transport
B. to provide a hydrophilic head so that water can enter the cell
C. to package and sort molecules to be sent in vesicles
D. to read messenger RNA to assemble amino acids

3. Which of the following is the most accurate statement comparing cell membranes and cell walls?
A. Cell walls prevent everything from entering the cell, while cell membranes allow some things to enter.
B. Cell membranes function mostly as selectively permeable gatekeepers while cell walls function mainly as support systems.
C. Cell membranes are found only in animal cells; cell walls are found only in plant cells.
D. Cell walls function mostly for photosynthesis while cell membranes function mostly for cellular respiration.

Cell Transport

1. Which means of particle transport is shown in the figure below?

A. Osmosis
B. Diffusion
C. Facilitated diffusion
D. Active transport



2. Which process requires cellular energy?
A. active transport
B. passive transport
C. diffusion
D. osmosis

3. Which statement best describes diffusion?
A. Diffusion requires the cell to use energy.
B. Diffusion is an example of active transport.
C. Diffusion occurs when particles spread from areas where they are less concentrated to areas where they are more concentrated.
D. Diffusion occurs when particles spread from areas where they are more concentrated to areas where they are less concentrated.

Tonicity

1. A student set up the following investigation. An artificial membrane separates two fluid filled compartments. This membrane is permeable to water but impermeable to sucrose. Both compartments initially hold the same amount of fluid, which consists of sucrose dissolved in water. The fluid in compartment A is a 20% sucrose solution. The fluid in compartment B is a 35% sucrose solution.

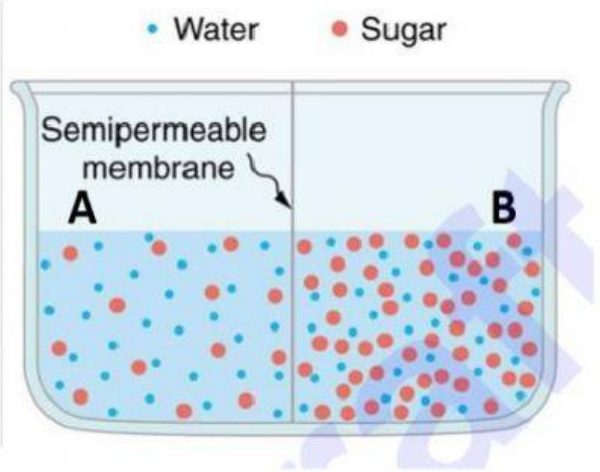
Which prediction is correct?

A. Water will move from compartment A to compartment B by osmosis.

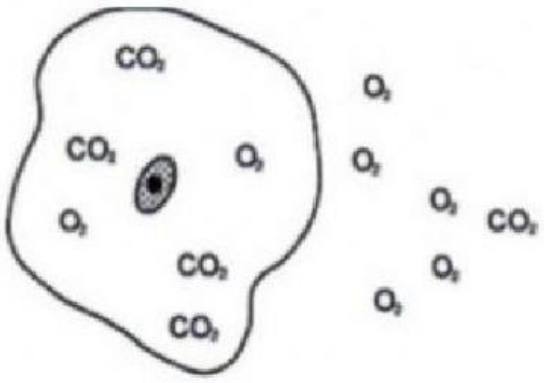
B. Water will move from compartment B to compartment A by osmosis.

C. Sucrose will move from compartment A to compartment B by diffusion.

D. Sucrose will move from compartment B to compartment A by diffusion.



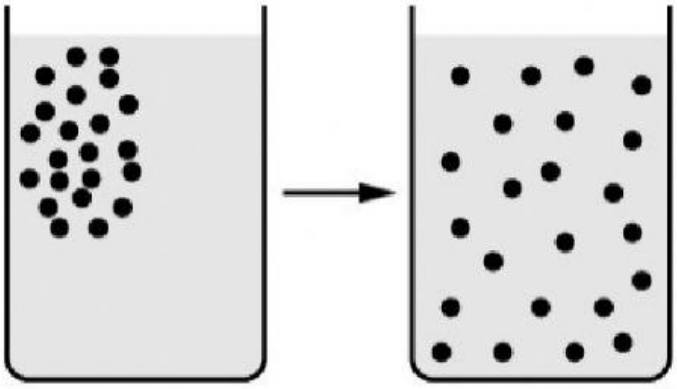
2. Use the illustration of a cell in its environment below to answer the question. Based on the distribution of these molecules, what will most likely happen after a certain amount of time?A. The concentration of CO2 will remain the same inside the cell.
B. The concentration of O2 will remain the same outside the cell.
C. The concentration of CO2 will decrease outside the cell.
D. The concentration of O2 will increase inside the cell.



3. Maggie places cells of Elodea, a freshwater plant, on a wet-mount microscope slide. She uses a saltwater solution to prepare the slide. When she observes the cells under the microscope, what is she MOST LIKELY to see?
A. The cells will shrink within the cell walls.
B. The cells will swell, expanding the cell walls.
C. The cell walls will dissolve, releasing the cell.
D. The cells will not be affected and remain unchanged.

4. A balloon allows water but not sugar to pass through it. The balloon contains a 10% sugar solution. A beaker contains a 5% sugar solution. Which statement is true?
A. When placed in the beaker, the balloon will gain water by osmosis.
B. When placed in the beaker, the balloon will lose water by osmosis.
C. When placed in the beaker, the balloon will gain water by active transport.
D. When placed in the beaker, the balloon will lose water by active transport.

5. Use the diagram below to answer the question.



The diagram shows a beaker of water and molecules of red dye at the beginning of an experiment (Time 1) and the same beaker of water and molecules of red dye after 30 minutes (Time 2). Which of the following best explains what happened?
A. Molecules of red dye moved by diffusion from a higher concentration to a lower concentration.
B. Molecules of red dye moved by active transport from a higher concentration to a lower concentration.
C. Molecules of water moved by osmosis from a higher concentration to a lower concentration.
D. Molecules of water moved by active transport from a higher concentration to a lower concentration.