TEST NAME: **Biology Test 1**
TEST ID: **2807903**
GRADE: **10 - Tenth Grade**
SUBJECT: **Life and Physical Sciences**
TEST CATEGORY: **School Assessment**

Student: _____

Class: _____

Date: _____

1. Which structures are ***least likely*** to appear in the same eukaryotic cell?

   A. mitochondria and chloroplasts

   B. ribosomes and mitochondria

   C. a cell wall and chloroplasts

   D. small vacuoles and a cell wall

2. Which of the following structures separates a nucleus from its environment?

   A. cell wall

   B. plasma membrane

   C. nuclear membrane

   D. endoplasmic reticulum

3. How do eukaryotic organisms differ from prokaryotic organisms?

   A. Prokaryotic organisms are not made up of cells.

   B. Prokaryotic organisms do not contain genetic information.

   C. All eukaryotic organisms have many cells, and prokaryotic organisms have only one.

   D. Prokaryotic organisms do not have a nucleus.

4. Which term describes the movement of water through a cell membrane?

   A. osmosis

   B. metabolism

   C. homeostasis

   D. active transport

5. Which type of cellular transport requires a cell to use energy?

A. facilitated diffusion

B. active transport

C. osmosis

D. passive transport

6. **In a multicellular organism, the lungs are responsible for exchanging gases (O_2 and CO_2) with the organism's environment. Which cellular structure performs the same task for a cell?**

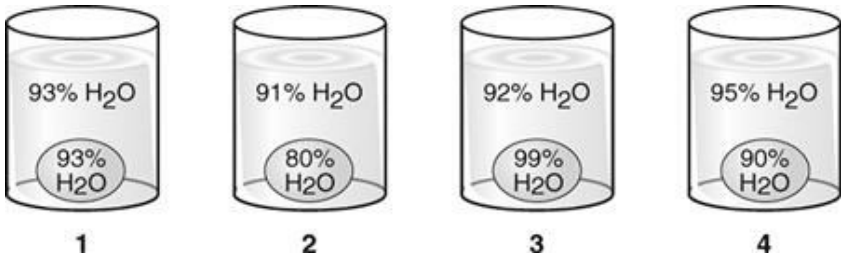
A. chloroplast

B. mitochondrion

C. plasma membrane

D. endoplasmic reticulum

7. **Each beaker shown below contains an amphibian egg collected from one of four different locations.**



Which of these beakers contains an egg that would shrink?

A. 1

B. 2

C. 3

D. 4

8. **Which of the following foods is highest in polysaccharides?**

A. broccoli

B. potatoes

C. cheese

D. fish

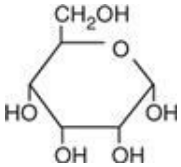
9. **Where are proteins synthesized?**

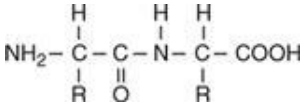
A. mitochondria
B. ribosomes
C. centrioles
D. lysosomes

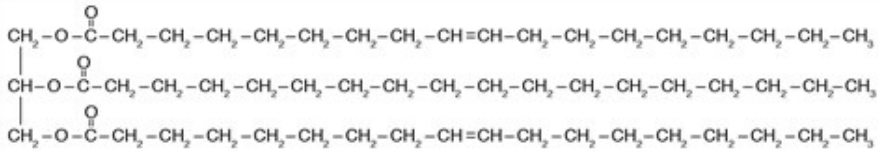
10. **Which of these are composed of carbon, hydrogen, and oxygen *only*?**

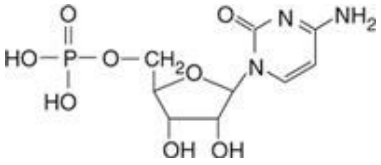
A. proteins and nucleic acids
B. lipids and proteins
C. carbohydrates and lipids
D. steroids and DNA

11. **One function of proteins is to provide structure for tissues and organs. Which of the following are the building blocks of proteins?**

A. 

B. 

C. 

D. 

12. **In living things, smaller substances are linked to make up larger substances. Which of the following correctly describes a larger substance made by linking smaller substances?**

A. Nucleotides are linked to make up DNA.
B. Amino acids are linked to make up DNA.
C. Proteins are linked to make up nucleotides.
D. Nucleic acids are linked to make up proteins.

13. **Isabelle wants to determine whether a homeostatic process requires energy to proceed. Which characteristic should she look for?**

A. a reaction that uses ATP
B. a reaction that is coupled to the hydrolysis of carbohydrates
C. movement of a substance across a membrane, down a concentration gradient
D. movement of a substance across a membrane in both directions

14. **What is the repeating monomer of a DNA molecule?**

A. triglyceride
B. dipeptide
C. nucleotide
D. phospholipid

15. **The table below describes some substances found in cells.**

	Cell substance	Function
1	Nucleic acids	linked to make up nucleotides
2	Protein molecules	linked to make up amino acids
3	Amino acids	linked to make up proteins
4	Nitrogenous bases	linked to make up proteins

Which row provides correct information?

A. 1
B. 2
C. 3
D. 4

16. **Which of these is part of the description of protein?**

A. a folded chain of amino acids
B. a folded chain of carbohydrates
C. a branched chain of fatty acids
D. a branched chain of nucleic acids

17. **In organisms, macromolecules are made up of subunits. Which of these pairs correctly describes how a macromolecule is constructed?**

A. DNA is made up of amino acids.
B. Polysaccharides are made up of monosaccharides.
C. Nucleotides are made up of nucleic acids.
D. Amino acids are made up of protein.

18. **Which is the BEST example of an organism using behavior to maintain homeostasis?**

A. A snake moves from a sunny area to a shady area to cool down.
B. An elephant uses low-frequency sound waves to find its herd.
C. A chameleon's skin becomes green when it sits on a leaf.
D. An alewife fish turns when other members of its school turn.

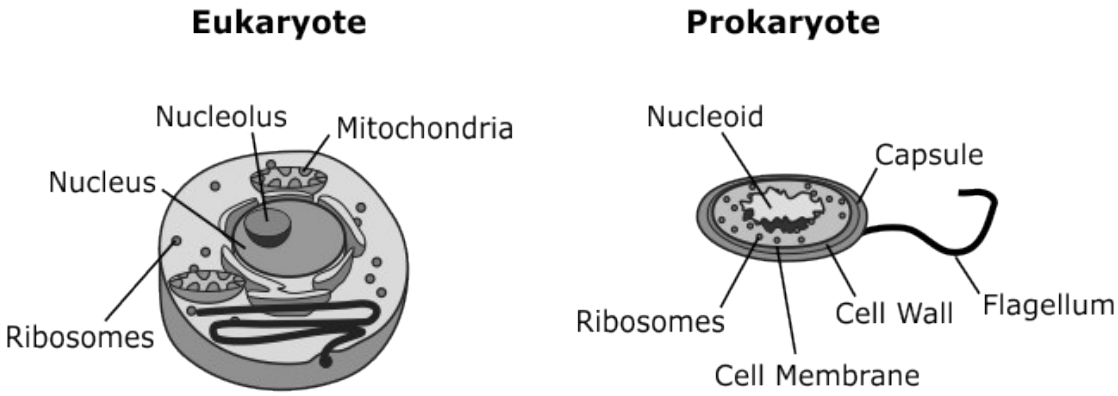
19. **All organisms contain DNA and RNA. What are the subunits of DNA and RNA?**

A. simple sugars
B. amino acids
C. carbohydrates
D. nucleotides

20. **In eukaryotic organisms, interaction between which cell parts is MOST important for cell shape and moving materials in and out of the cell?**

A. cytoskeleton and cell membrane
B. cytoplasm and Golgi apparatus
C. nucleus and endoplasmic reticulum
D. ribosome and central vacuole

21. These illustrations show a eukaryotic cell and a prokaryotic cell.



Which of these is a valid comparison of the two cells pictured?

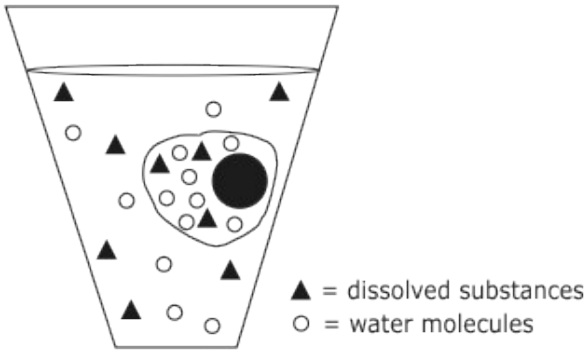
A. Both cells are equal in complexity.

B. Both cells contain genetic information (DNA).

C. Both cells transform energy using mitochondria.

D. Both cells have a rigid, outer barrier for protection.

22. This diagram shows a cell placed in a solution containing a higher concentration of dissolved substances.



How will this affect the cell?

A. Water will exit the cell to maintain homeostasis.

B. Water will enter the cell to maintain homeostasis.

C. Dissolved substances will exit the cell by diffusion.

D. Dissolved substances will enter the cell by diffusion.

23. How does the nuclear membrane help the cell?

A. provides a rigid shape and size

B. separates DNA from the rest of the cell

C. allows substances to move into and out of the cell

D. contains pigments to protect the cells from sunlight

24. Which organic molecules are used for long-term energy storage?

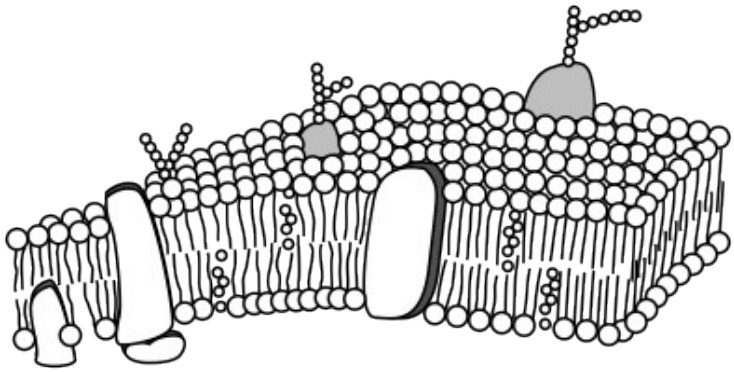
A. lipids

B. proteins

C. nucleic acids

D. carbohydrates

25. This diagram is of a structure found in a cell.



How does this structure help the cell function?

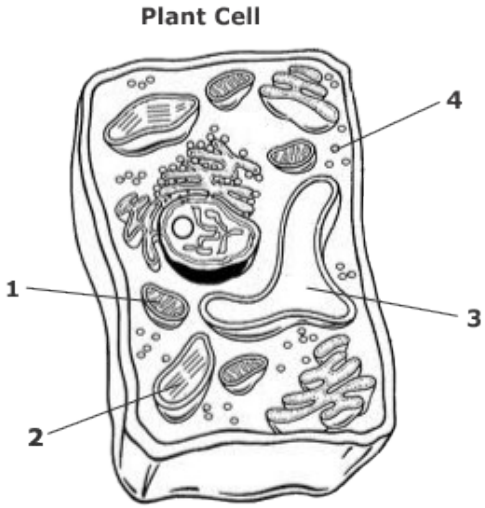
A. by acting as the control center for the cell

B. by forming a rigid, outer barrier for the cell

C. by serving as the site for protein synthesis in the cell

D. by regulating the movement of materials into and out of the cell

26. This is a diagram of a plant cell.



Which describes structure 2?

A. It serves as the site for protein synthesis.

B. It contains genetic information.

C. It transforms the sun's energy.

D. It stores water and nutrients.

27. The central vacuole in a plant cell fills with which fluid so the plant will not wilt?

A. cellulose

B. chorophyll

C. cytoplasm

D. water

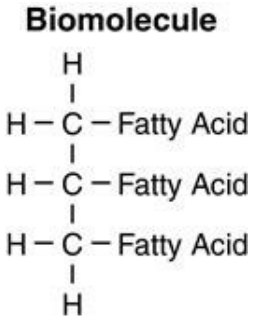
28. Which is found in both a eukaryotic cell and a prokaryotic cell?

A. chloroplast
B. mitochondria
C. nucleus
D. ribosome

29. **Which of these is found in both prokaryotic and eukaryotic cells?**

A. vacuole
B. nucleoid
C. mitochondrion
D. cytoplasm

30. **The diagram shows the basic structure of a biomolecule.**



Based on the structure, what is the identity of this biomolecule?

A. triglyceride
B. amino acid
C. phospholipid
D. glucose

31. **Which biomolecule does NOT have a carbon-nitrogen bond?**

A. protein
B. peptide
C. nucleic acid
D. carbohydrate

32. **How are the functions of a carbohydrate and a lipid similar?**

A. Both are a source of energy.
B. Both are replicated during meiosis.
C. Both lower the activation energy of reactions.
D. Both dissolve nutrients in the digestive system.

33. **Which type of molecules combine to make up the protein portion of hemoglobin?**

A. fatty acids
B. amino acids
C. monosaccharides
D. polysaccharides

34. **Which of these statements describes how monomers combine and create macromolecules?**

A. Amino acids combine to make proteins.
B. Glucose molecules combine to make nucleic acids.
C. Nucleic acids combine to make starch.
D. Proteins combine to make glucose.

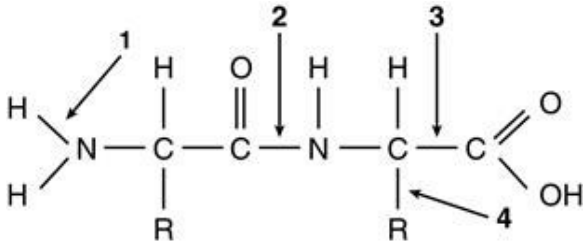
35. **A student identifies the following parts of a cell.**

1. cell wall
2. DNA
3. mitochondrion
4. ribosome

The presence of which structure allows the student to conclude that this is a eukaryotic cell?

A. Structure 1
B. Structure 2
C. Structure 3
D. Structure 4

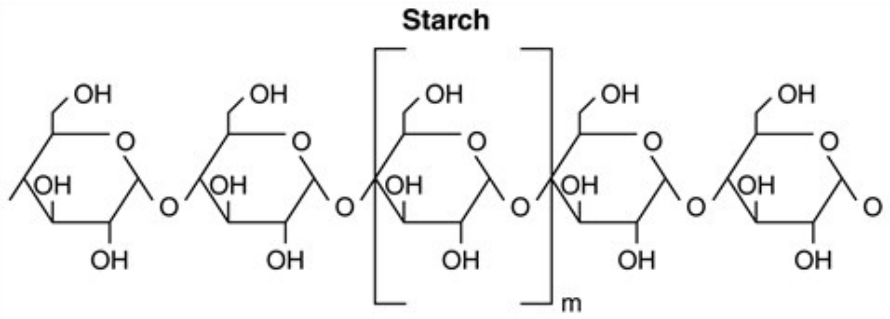
36. **The structural diagram demonstrates two joined amino acids.**



Which arrow points to the peptide bond?

A. 1
B. 2
C. 3
D. 4

37. **The diagram shows the structural formula for starch.**



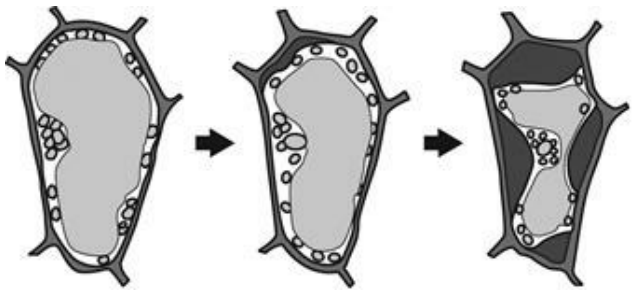
Which of the following explains why starch is a polymer?

A. repetitive combination of simple subunits
B. organic compound molecule
C. high mobility as a result of its long length
D. contains carbon-based functional groups

38. **Which type of molecules combine to make up the protein portion of hemoglobin?**

A. fatty acids
B. amino acids
C. monosaccharides
D. polysaccharides

39. **A student used a microscope to observe *Elodea* submerged in a solution. The student observed the cell cytoplasm pull away from the cell wall and clump together in the center of the cell.**



Which statement BEST explains why this occurred?

A. The cell was submerged in a pure solution.
B. The cell was submerged in a hypotonic solution.
C. The cell was submerged in an isotonic solution.
D. The cell was submerged in a hypertonic solution.

40. **A lipid bilayer allows certain molecules to pass through and blocks other molecules. Which structure is most often protected by a lipid bilayer?**

A. cell
B. organ
C. tissue
D. system

41. **A researcher observes membrane-bound structures, including a nucleus, in a cell. Based on this observation, the researcher can conclude that the cell is classified as a**

A. bacterium.
B. virus.
C. prokaryote.
D. eukaryote.

42. **According to cell classification, prokaryotic cells are separated from eukaryotic cells. Which feature is often used to distinguish prokaryotic cells from eukaryotic cells?**

A. ribosomes
B. size differences
C. plasma membranes
D. energy molecules

43. **How are the functions of a carbohydrate and a lipid similar?**

A. Both are a source of energy.
B. Both aid in insulation
C. Both make up cell membranes
D. Both are composed of nucleotides

44. **A biological molecule is analyzed, and it is discovered that the molecule is composed of six carbon atoms, twelve hydrogen atoms, and six oxygen atoms. Which of these identifies the biological molecule?**

A. It is a lipid.
B. It is a protein.
C. It is an unsaturated fat.
D. It is a monosaccharide.

45. **A student builds a plant cell model by arranging different foods in a bowl.**

In this cell model, what do the different pieces of food represent?

A. substances that the cell consumes
B. structures that perform different cell activities
C. tissues that are formed by different cells
D. different organisms within the cell

46. **Which component of the cell membrane functions to actively transport molecules into the cell?**

A. carbohydrate
B. cytoplasm
C. phospholipid
D. protein

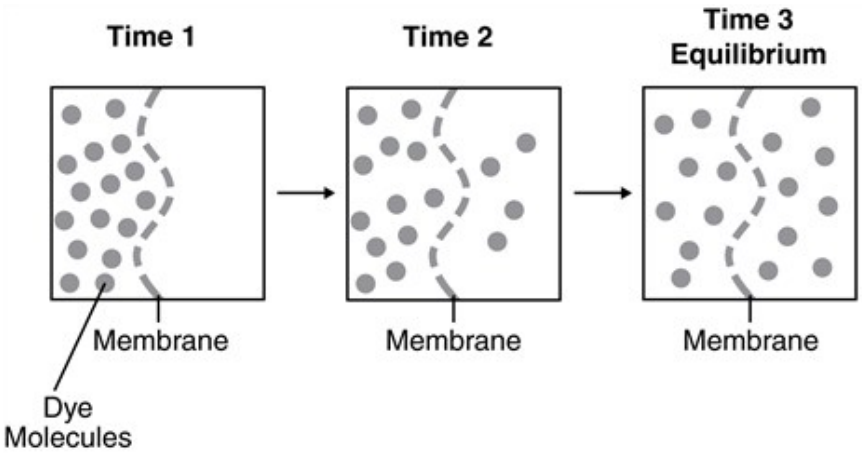
47. **The concentration of sodium (Na^+) and potassium (K^+) ions inside and outside a nerve cell must be reset each time the transmission of a nerve impulse occurs. Both ion types are able to move across the nerve cell membrane against the concentration gradient. To maintain these gradients, nerve cells depend directly on the chemical energy of which molecule?**

A. RNA
B. DNA
C. ATP
D. H_2O

48. **Which process moves an ion across a cell membrane against the concentration gradient?**

A. diffusion
B. endocytosis
C. facilitated diffusion
D. active transport

49. **The series shows a water solution containing dye molecules. Over time, the dye molecules move across a membrane toward equilibrium.**



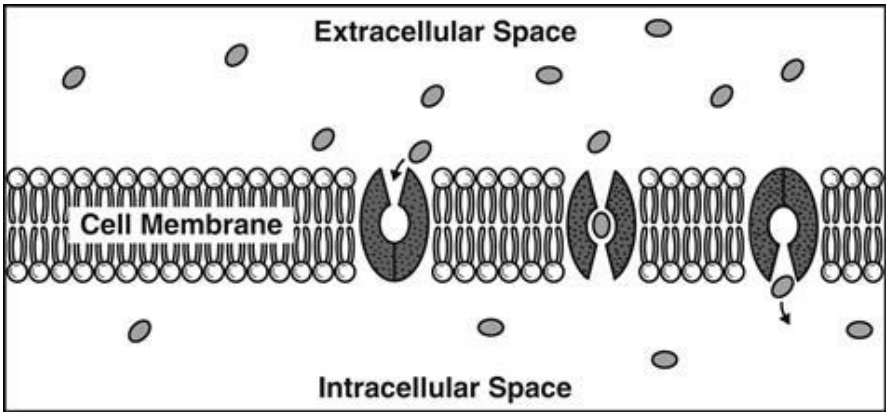
Which will change MOST as the system moves toward equilibrium?

A. the volume of the solution
B. the shape of dye molecules
C. the temperature of the water
D. the concentration of dye molecules

50. **Cell membranes allow some molecules to move freely across the membrane, while other molecules are restricted. Which term BEST describes this capability of a cell membrane?**

A. semipermeable
B. impervious
C. resilient
D. unyielding

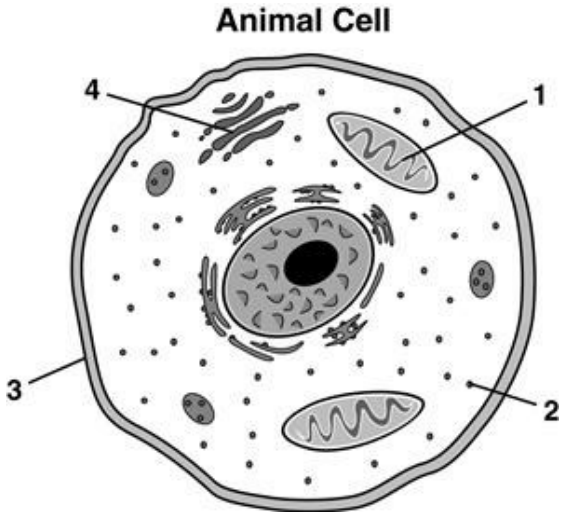
51. **The diagram illustrates the movement of molecules through a cell membrane.**



What process is being used by the cell to move the molecules?

A. osmosis
B. exocytosis
C. active transport
D. facilitated diffusion

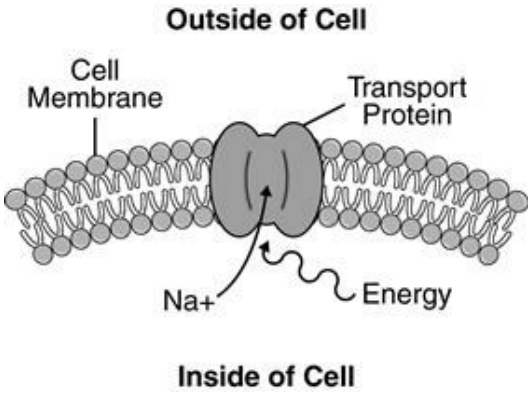
52. **A diagram of a cell is shown below.**



In which structure is protein synthesized?

A. 1
B. 2
C. 3
D. 4

53. **The diagram illustrates the use of energy by a nerve cell to expel a sodium ion from inside of the cell.**



Which BEST explains why energy is necessary to complete this function?

A. The ion is being transported against a concentration gradient.
B. The ion has more energy than surrounding molecules.
C. The ion is a waste product that is digested by the cell membrane.
D. The ion is too large to pass through the cell membrane by diffusion.

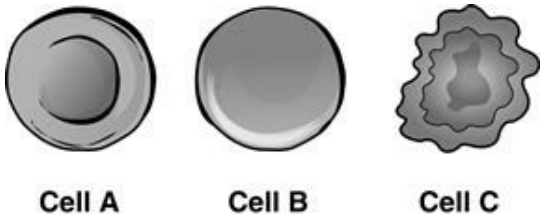
54. **What will happen to a cell that is placed in a hypotonic solution?**

A. Water will exit the cell causing it to shrink.
B. Water will enter the cell causing it to swell.
C. Salt will exit the cell causing it to shrink.
D. Salt will enter the cell causing it to swell.

55. **Which cellular structure in an animal cell helps maintain homeostasis by controlling the transportation of substances into and out of the cell?**

A. vacuole
B. cell wall
C. mitochondrion
D. cell membrane

56. **Shira is analyzing samples of red blood cells using a microscope. Her observations are shown.**



Shira observes that the shape of Cell A appears normal, while Cell B appears swollen and Cell C is shrunken. The apparent shrinking of Cell C indicates the reaction of the cell to what?

A. low oxygen content outside the cell
B. lower solute concentration outside the cell than inside
C. more oxygen inside the cell than what can be utilized
D. higher solute concentration outside the cell than inside

57. A freshwater plant is placed in a container of saltwater. What will ***most likely*** happen to the cells of the plant?

A. They will swell because water will move into them.
B. They will swell because salt will move into them.
C. They will shrink because water will move out of them.
D. They will shrink because salt will move out of them.

58. Which would be the ***best*** evidence that a cell is using active transport to move a substance across its cell membrane?

A. Substances are moving rapidly across the cell membrane.

B. ATP is being rapidly consumed near the cellular membrane.

C. Substances are moving from high to low concentrations.

D. Substances are moving through channels in the cell membrane.

59. Which type of molecule do whales use for energy storage and insulation?

A. DNA

B. glucose

C. fat

D. starch

60. During strenuous exercise, body temperature increases. The body responds to the increase in temperature by sweating, which helps to reduce the body temperature. Which is demonstrated in this situation?

A. hydrolysis

B. metabolism

C. homeostasis

D. synthesis

61. What are the subunits of DNA and their function?

A. nucleotides that store genetic information

B. monosaccharides that provide quick energy for the cell

C. lipids that store energy and provide insulation

D. proteins that provide the building blocks for the structural components of organisms

62. Cells in your intestinal lining have a higher concentration of sodium than your food. How do they acquire the additional sodium they need?

A. osmosis

B. diffusion

C. active transport

D. passive transport

63. Which is a form of transport that permits water to cross a semi-permeable membrane from areas of high concentration to low concentration?

A. osmosis

B. diffusion

C. dehydration synthesis

D. active transport

64. Which process includes all of the others?

A. passive transport

B. facilitated diffusion

C. diffusion across a membrane

D. osmosis

65. Which scenario below could be used to represent how a cell uses active transport to move molecules across a membrane?

A. a fish swimming upstream

B. a child riding a bike down a hill

C. wind blowing a sailboat in the ocean

D. a car driving through a mountain tunnel

66. Which explains how buffers help cells to maintain homeostasis?

A. provide hydration for the cell

B. help keep the pH within a cell constant

C. contain enzymes to speed up chemical reactions

D. supply nutrients for growth and cellular processes

67. A disease resulted in mitochondria being unable to function properly. How could this ***most*** directly affect an organism's ability to maintain homeostasis?

A. Potassium inside nerve cells could not be kept at higher levels than the surrounding body fluids.

B. Osmosis could not occur resulting in the inability of water to move in and out of the cells.

C. Gases such as carbon dioxide and oxygen could not diffuse in and out of the cells.

D. Cells would be unable to use membrane proteins to carry out facilitated diffusion.

68. Which situation would require a buffer?

A. lungs with too much mucus

B. a stomach with a pH too high

C. a heart with excess cholesterol

D. kidneys with a low concentration of water

69. An organism's ability to maintain balance and stability within its vital internal systems is ***best*** referred to as what process?

A. mitosis

B. homeostasis

C. photosynthesis

D. asexual reproduction

70. Which reaction would the body use to maintain homeostasis in cold temperatures?

A. shivering

B. sweating

C. rumbling of the stomach

D. restricting of blood vessels in the skin

71. If a solution outside a cell is more concentrated than the environment inside the cell, what is the term given for the solution outside the cell?

A. isotonic

B. hypotonic

C. hypertonic

D. equilibrium

72. Which protein is used to regulate blood glucose levels?

A. amylase

B. hemoglobin

C. insulin

D. melanin

73. Which organic molecule is paired with its basic building block?

A. carbohydrate : amino acids

B. nucleic acid : nucleotides

C. lipid : monosaccharides

D. protein : fatty acids

74. Which is the structure found in eukaryotic and prokaryotic cells that allows nutrients to enter the cell and wastes to leave the cell?

A. vacuole

B. cell wall

C. chloroplasts

D. plasma membrane

75. Which molecules form the bilayer of the cell membrane?

A. carbohydrate

B. cholesterol

C. phospholipid

D. protein

76. A solution high in salt content will have what affect on a plant cell's vacuole?

A. The vacuole will shrink because it will lose water.

B. The vacuole will swell because water is added to the cell.

C. The vacuole will shrink because the cell has gained water.

D. The vacuole will swell because water is added to the vacuole.

77. Which is a function of lipids?

A. to supply cells with quick–release energy

B. to provide the body with insulation

C. to store genetic information

D. to regulate cell processes

78. Which is true of phospholipids located in the plasma membrane?

A. They have hydrophobic heads and hydrophilic tails.

B. They have hydrophobic tails and hydrophilic heads.

C. They are composed of glucose molecules.

D. They are composed of amino acids.

79. Which is the primary function of a vacuole?

A. to digest food and water

B. to store food and water

C. to remove wastes

D. to store proteins

80. Which organic molecules supply energy to cells?

A. carbohydrates and nucleic acids

B. proteins and nucleic acids

C. lipids and carbohydrates

D. lipids and nucleic acids

81. When compared to prokaryotic cells, which is true of eukaryotic cells?

A. Eukaryotic cells have DNA contained in a membrane-bound nucleus.

B. Eukaryotic cells have circular DNA strands called plasmids.

C. Eukaryotic cells have DNA found only in mitochondria.

D. Eukaryotic cells have DNA located in their cytoplasm.

82. When comparing eukaryotic cells to prokaryotic cells, which is true?

A. Prokaryotic cells are more complex than eukaryotic cells.

B. Prokaryotic cells are less complex than eukaryotic cells.

C. Eukaryotic cells are less complex than prokaryotic cells.

D. Eukaryotic cells are as complex as prokaryotic cells.

83. What makes eukaryotic cells more complex than prokaryotic cells?

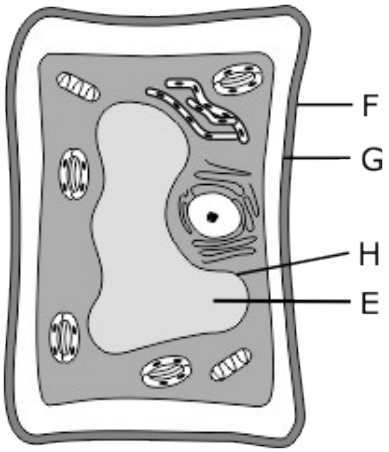
A. the presence of ribosomes

B. the presence of nucleic acids

C. the presence of the plasma membrane

D. the presence of membrane-bound organelles

84. This picture represents a plant cell.



Which letter points to the cell wall?

A. E

B. F

C. G

D. H

85. Which type of organic compound is the major component of a plant cell wall?

A. lipid

B. protein

C. nucleic acid

D. carbohydrate

86. The diagrams below show configurations of phospholipids.

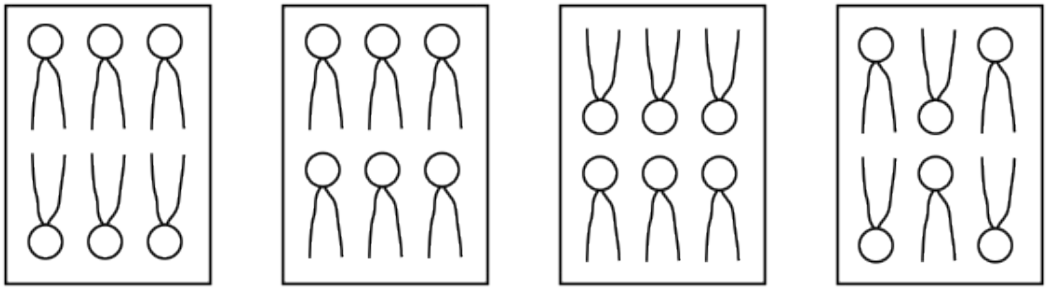


Diagram 1 Diagram 2 Diagram 3 Diagram 4

Which diagram is the ***best*** representation of the plasma membrane?

A. Diagram 1

B. Diagram 2

C. Diagram 3

D. Diagram 4

87. Comparing prokaryotic cells and eukaryotic cells, which is an accurate statement?

A. Prokaryotic cells have membrane-bound organelles and eukaryotic cells do not have membrane-bound organelles.

B. Prokaryotic cells and eukaryotic cells reproduce by meiosis.

C. Prokaryotic cells are generally smaller than eukaryotic cells.

D. Prokaryotic cells are more complex than eukaryotic cells.

88. How does the plasma membrane help the cell?

A. provides a rigid shape and size

B. separates DNA from the rest of the cell

C. allows substances to move into and out of the cell

D. contains pigments to protect the cells from sunlight

89. Which organic molecules are used for long-term energy storage?

A. lipids

B. proteins

C. nucleic acids

D. carbohydrates

90. Which is found in both a eukaryotic cell and a prokaryotic cell?

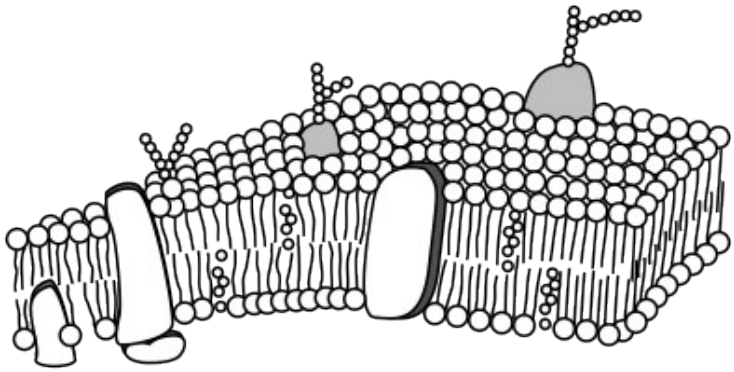
A. chloroplast

B. mitochondria

C. nucleus

D. ribosome

91. This diagram is of a structure found in a cell.



How does this structure help the cell function?

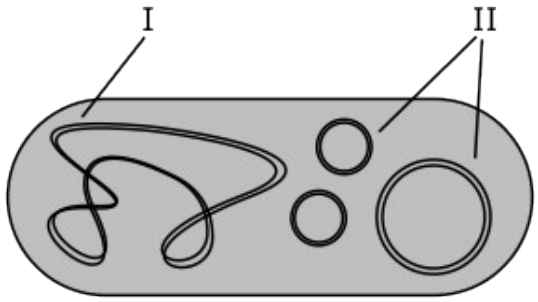
A. by acting as the control center for the cell

B. by forming a rigid, outer barrier for the cell

C. by serving as the site for protein synthesis in the cell

D. by regulating the movement of materials into and out of the cell

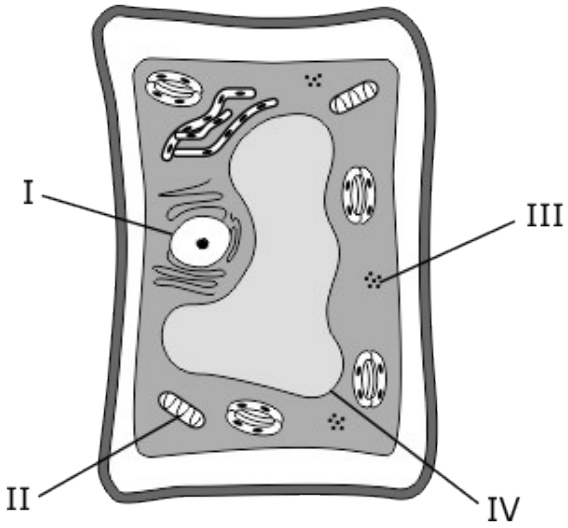
92. The diagram below shows a cell and its internal components.



Which ***best*** describes the cell type and the structures labeled II?

A. eukaryotic cell; structures are nuclei
B. prokaryotic cell; structures are plasmids
C. prokaryotic cell; structures are ribosomes
D. eukaryotic cell; structures are centromeres

93. This is a diagram of a cell.



How would this cell be classified?

A. as a prokaryotic plant cell
B. as a eukaryotic plant cell
C. as a prokaryotic animal cell
D. as a eukaryotic animal cell

94. A student looks at two slides through a microscope. The student determines that Slide X is a eukaryotic cell, and Slide Y is a prokaryotic cell. Which structure would help the student make this conclusion?

A. presence or absence of a cell membrane

B. presence or absence of a ribosome

C. presence or absence of cytoplasm

D. presence or absence of a nucleus

95. How are prokaryotic cells and eukaryotic cells similar?

A. Both cells contain RNA, ribosomes, and a cell wall.

B. Both cells contain DNA, ribosomes, and a cell membrane.

C. Both cells contain a nucleus, ribosomes, and cell membrane.

D. Both cells contain ribosomes, mitochondria, and a cell membrane.

96. How do prokaryotic cells differ from eukaryotic cells?

A. Prokaryotic cells contain mitochondria, unlike eukaryotic cells.

B. Prokaryotic cells contain ribosomes, unlike eukaryotic cells.

C. Prokaryotic cells contain plasmids, unlike eukaryotic cells.

D. Prokaryotic cells contain RNA, unlike eukaryotic cells.

97. Which process uses ATP to pump small molecules and ions across the cell membrane to maintain homeostasis?

A. passive transport

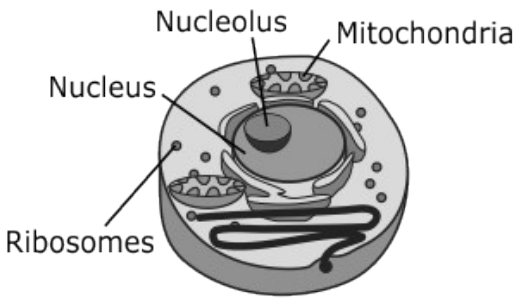
B. active transport

C. diffusion

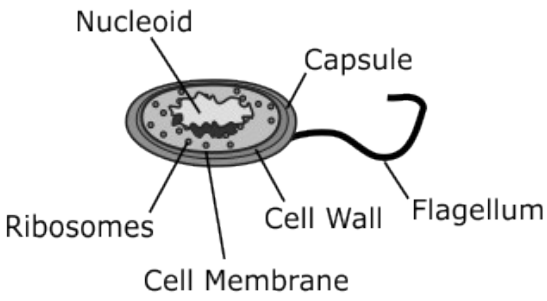
D. osmosis

98. These illustrations show a eukaryotic cell and a prokaryotic cell.

Eukaryote



Prokaryote



Which of these is a valid comparison of the two cells pictured?

A. Both cells are equal in complexity.

B. Both cells contain genetic information.

C. Both cells transform energy using mitochondria.

D. Both cells have a rigid, outer barrier for protection.