Biology Standard 1 (All elements)

Name: _____ **Date:** _____

1. Why do eukaryotic cells require mitochondria?

   A. to break down cell debris for recycling

   B. to control division for cell reproduction

   C. to release stored energy for cell activities

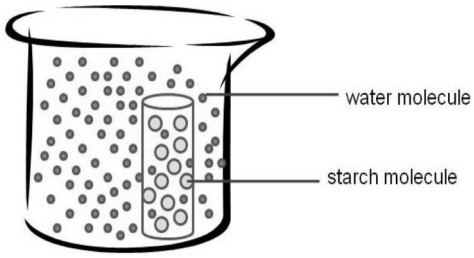
   D. to package materials inside cells for transport

2. Which structure is outside the nucleus of a cell and contains DNA?

   A. chromosome B. gene

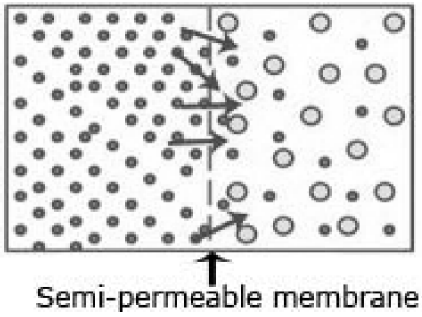
   C. mitochondrion D. vacuole

3. A potato core was placed in a beaker of water as shown in the figure below.



Which diagram *best* represents the net movement of molecules?

A.



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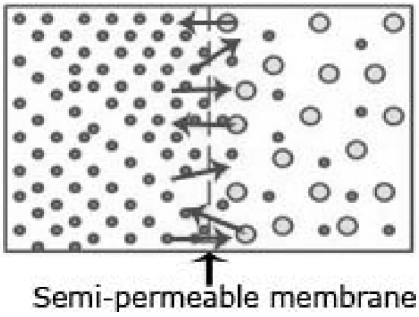

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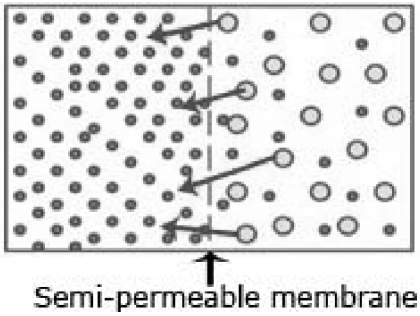

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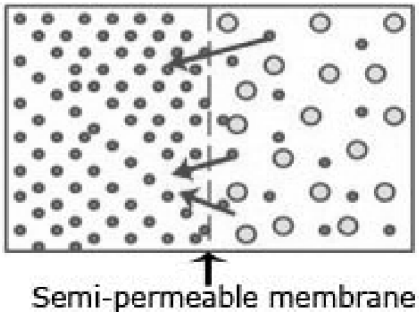
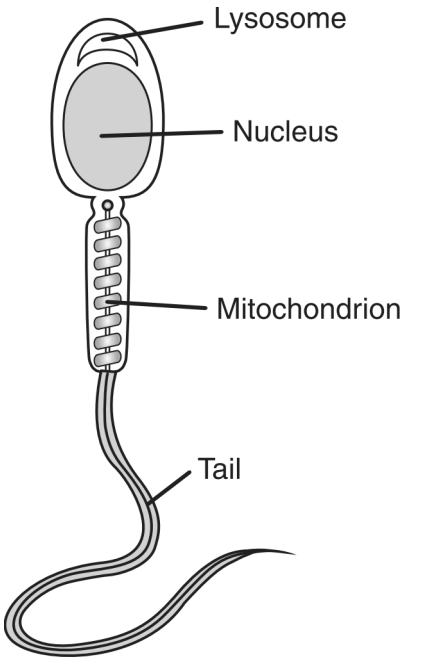


4. The diagram below shows a male gamete.



Which structure stores most of the genetic information?

A. mitochondrion
B. lysosome
C. nucleus
D. tail

5. Which of the following organelles use carbon dioxide to produce sugars?

A. vacuoles
B. ribosomes
C. chloroplasts
D. mitochondria

6. Which of the following lacks a nucleus?

A. a plant cell
B. an animal cell
C. an amoeba
D. a virus

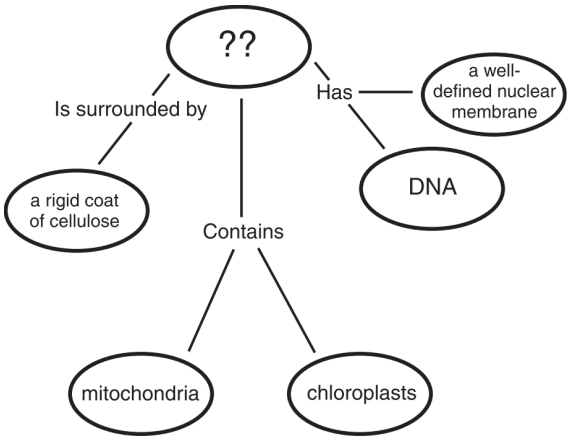
7. The cell membrane of the red blood cell will allow water, oxygen, carbon dioxide, and glucose to pass through. Because other substances are blocked from entering, this membrane is called

A. perforated.
B. semi-permeable.
C. non-conductive.
D. permeable.

8. The plasma membrane of a cell consists of

A. protein molecules arranged in two layers with polar areas forming the outside of the membrane.
B. two layers of lipids organized with the nonpolar tails forming the interior of the membrane.
C. lipid molecules positioned between two carbohydrate layers.
D. protein molecules with polar and nonpolar tails.

9.



Which of these *best* completes this concept map?

A. an animal cell
B. a prokaryotic cell
C. a virus
D. a plant cell

10. Which cellular organelle is responsible for packaging the proteins that the cell secretes?

A. cytoskeleton
B. cell membrane
C. lysosome
D. Golgi apparatus

11. Under what conditions will a substance be likely to enter a cell through diffusion?

A. when the substance is a particle of food
B. when a molecule of the substance is very large
C. when the concentration of the substance is greater outside the cell than inside
D. when the concentration of the substance is greater inside the cell than outside

12. Blight is a plant disease caused by a fungus that affects potato plants. Some wild breeds of potato have natural resistance to the fungus. These wild potatoes contain chemical compounds that cause them to taste bad. Scientists are trying to produce potato plants that are resistant to blight but still produce potatoes that taste good.

Which of the following describes an important difference between a potato plant cell and a human cell?

A. Plant cells have a cell wall, and animal cells do not.
B. Animal cells store water inside, and plant cells do not.
C. Plant cells have a cell nucleus, and animal cells do not.
D. Animal cells perform respiration, and plant cells do not.

13. Which structure is responsible for allowing materials into and out of an animal cell?

A. Nucleus
B. Cell wall
C. Mitochondrion
D. Cell membrane

14. Depending on its electric charge, shape, and chemical properties, a substance may or may not be allowed to pass through a cell membrane. This function of the cell membrane is important because it _____.

A. prevents cell division

B. prevents destruction of the cell wall

C. allows the cell to maintain homeostasis

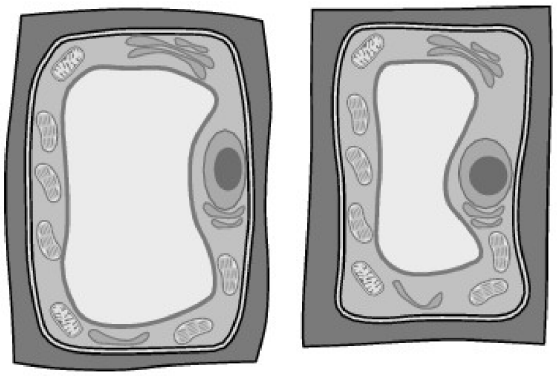
D. allows amino acids to move into and out of the cell

15. In a cell with a high energy requirement, which organelles are found in a high concentration?

A. Chromosomes B. Lysosomes

C. Mitochondria D. Vacuoles

16.



Before **After**

The diagram shows a plant cell before and after it is placed in a solution. After the cell is placed in the solution, it changes shape.

Which table shows the initial concentration of solute in the cell and in the solution that would cause the cell to change shape as shown in the diagram?

A.

Location	Solute Concentration
Inside cell	12%
Outside cell	12%

B.

Location	Solute Concentration
Inside cell	3%
Outside cell	6%

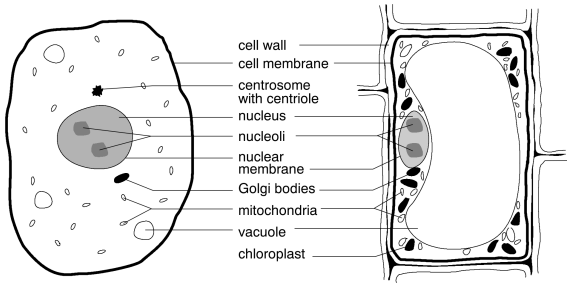
C.

Location	Solute Concentration
Inside cell	7%
Outside cell	5%

D.

Location	Solute Concentration
Inside cell	0%
Outside cell	0%

17. Use the diagrams below of an animal cell and a plant cell to answer the following question.



Features of plant cells that clearly make them different from animal cells are

A. a larger nucleus and fewer chromosomes.

B. a rigid cell wall and chloroplasts.

C. more cytoplasm and smaller vacuoles.

D. a changing size and indefinite shape.

18. Which statement describes the role of adenosine triphosphate (ATP) in a cell?

A. ATP moves materials out of a cell.

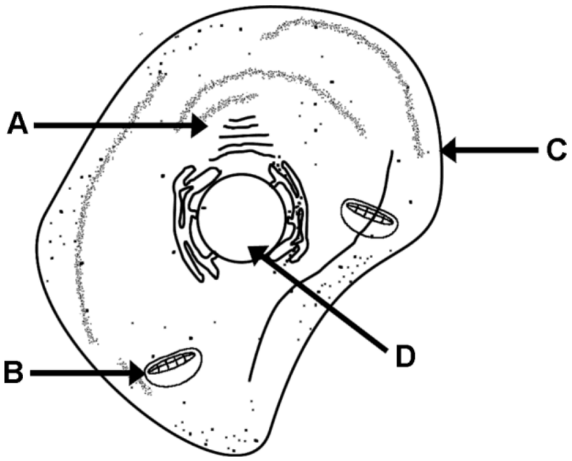
B. ATP transfers energy within a cell.

C. ATP collects wastes for a cell.

D. ATP controls protein synthesis in a cell.

19. Use the diagram to answer the question .

Cell Diagram



Which arrow indicates the location of the cell membrane?

A. arrow A B. arrow B

C. arrow C D. arrow D

20. The starch and water molecules in potato cells are stored in what organelle?

A. mitochondrion B. nucleus

C. ribosome D. vacuole

21. Which cellular organelle uses oxygen and glucose to provide energy to the cell?

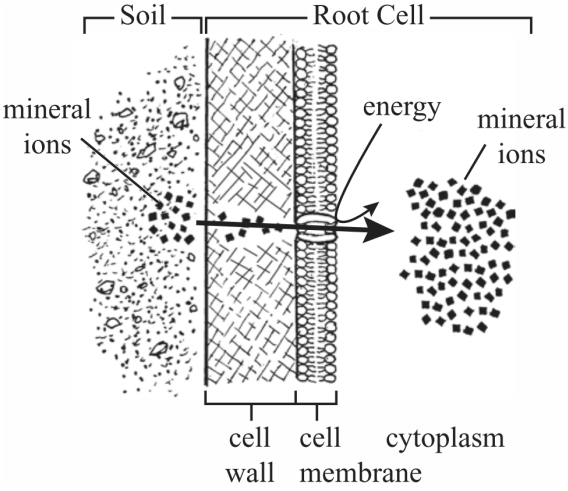
A. mitochondrion B. nucleus

C. ribosome D. vacuole

22. What are the basic structural units of living organisms?

A. cells
B. nuclei
C. organs
D. tissues

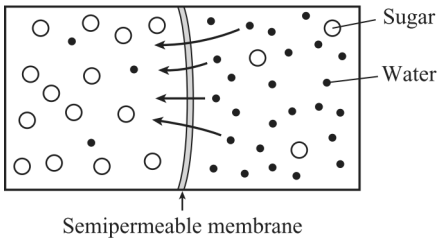
23. The diagram below illustrates how plant root cells take in mineral ions from the surrounding soil.

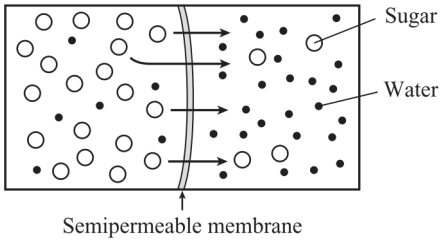


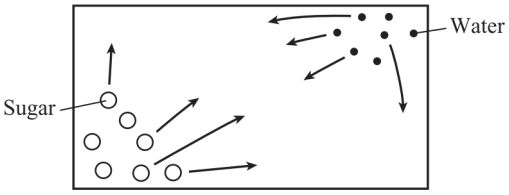
Which of the following processes is illustrated?

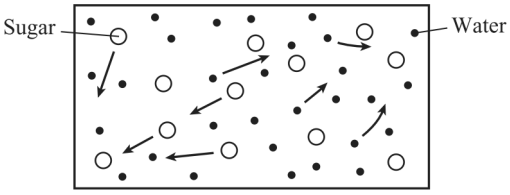
A. active transport
B. diffusion
C. osmosis
D. passive filtration

24. Which of the diagrams below *best* represents the net movement of molecules in osmosis?

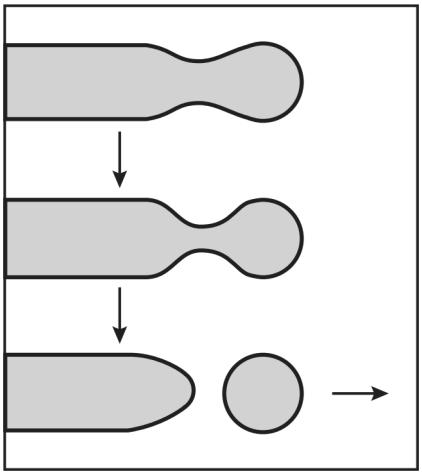
A.


B.


C.


D.


25. A cross section of part of a Golgi complex is shown below.



Part of the membrane of the Golgi complex pinches off and moves away. Which of the following is a function of this process?

A. to release energy from ATP

B. to deliver proteins to other locations in the cell

C. to collect amino acids for use in protein synthesis

D. to send messages about cell requirements to the nucleus

26. Which of the following functions does active transport perform in a cell?

A. packaging proteins for export from the cell

B. distributing enzymes throughout the cytoplasm

C. moving substances against a concentration gradient

D. equalizing the concentration of water inside and outside the cell

27. The table below lists the concentrations of water inside and outside a cell under four different conditions.

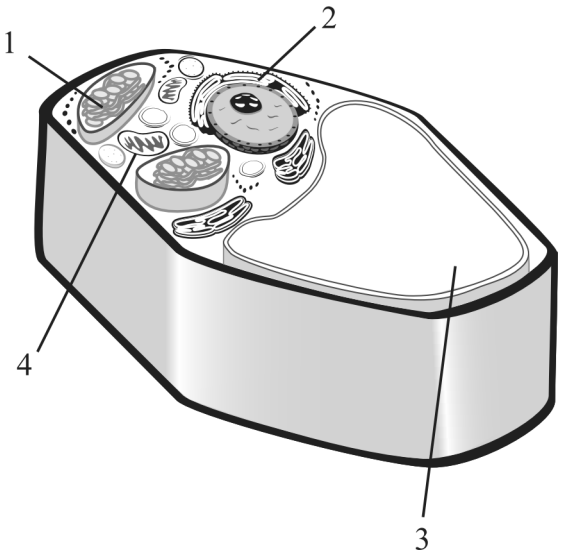
Condition	Water Concentration in Cell	Water Concentration in Environment
1	90%	95%
2	90%	100%
3	95%	90%
4	95%	95%

Under which condition will the cell experience a net loss of water to its environment?

A. Condition 1 B. Condition 2

C. Condition 3 D. Condition 4

28. A diagram of a plant cell is shown below.



Which number identifies the organelle that functions to store water and dissolved salts?

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

29. In a cell, which of the following organelles *most likely* contains digestive enzymes?

A. centriole
B. chloroplast
C. lysosome
D. ribosome

30. A lab technician needs to determine whether cells in a test tube are prokaryotic or eukaryotic. The technician has several dyes she could use to stain the cells. Four of the dyes are described in the table below.

Dye	Test
acridine orange	stains DNA and RNA
osmium tetroxide	stains lipids
eosin	stains cell cytoplasm
Nile blue	stains cell nuclei

Which dye could the technician use to determine whether the cells are prokaryotic or eukaryotic?

A. acridine orange
B. osmium tetroxide
C. eosin
D. Nile blue

31. If a cell's lysosomes were damaged, which of the following would *most likely* occur?

A. The cell would produce more proteins than it needs.
B. The cell would have chloroplasts that appear yellow rather than green.
C. The cell would be less able to break down molecules in its cytoplasm.
D. The cell would be less able to regulate the amount of fluid in its cytoplasm.

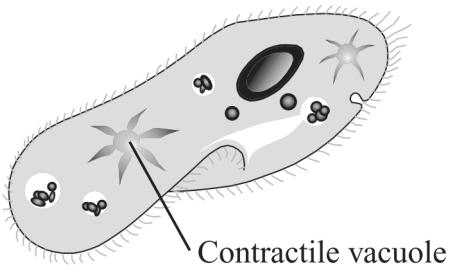
32. Amino acids, sugars, and ions move across the cell membrane. Their movement from a region of high concentration to a region of low concentration is accomplished by special proteins in the membrane.

Which of the following terms applies to this type of cell transport?

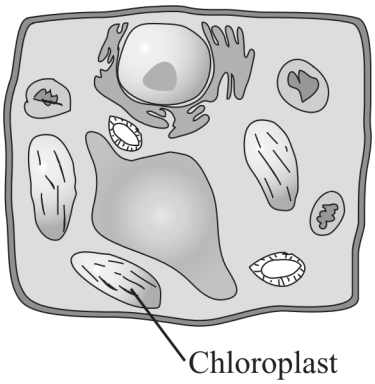
A. active transport
B. facilitated diffusion
C. osmosis
D. transcription

33. Scientists believe that the first organisms that appeared on Earth were prokaryotic. Which of the following *best* represents what the cell structure of these organisms may have looked like?

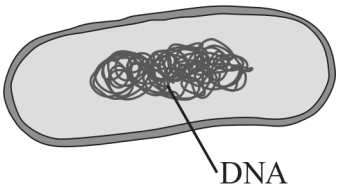
A.



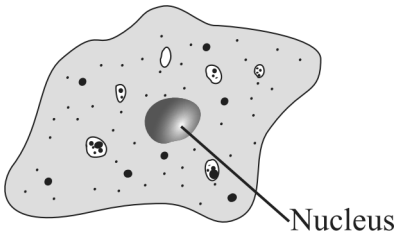
B.



C.

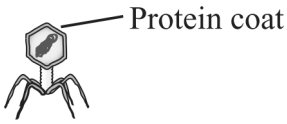


D.

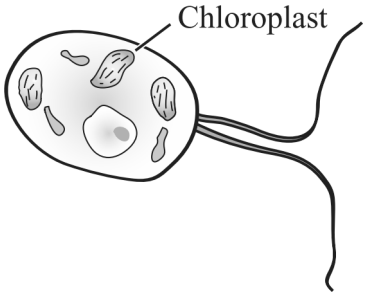


34. Which of the following diagrams shows a prokaryotic cell?

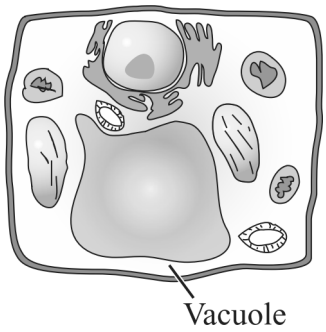
A.



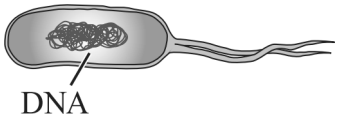
B.



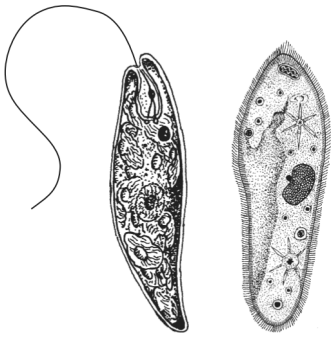
C.



D.



35. The illustration below represents two protists.



Euglena *Paramecium*

What do these two organisms have in common?

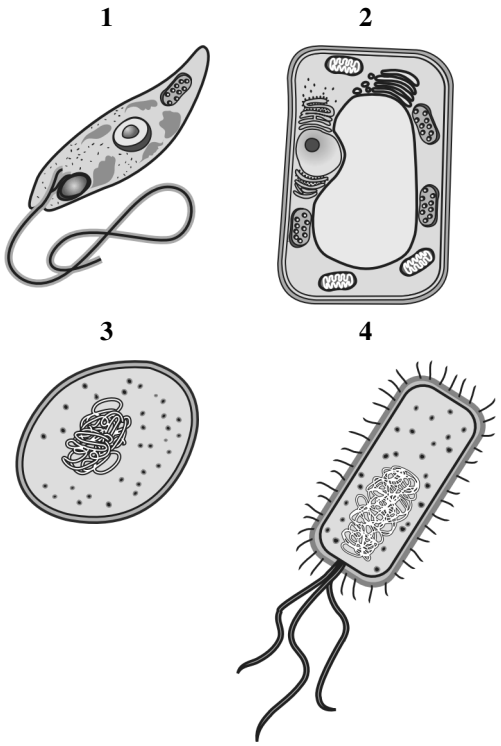
A. They are unicellular.

B. They cause diseases.

C. They live underground.

D. They are photosynthetic.

36. Each of the illustrations below shows either a prokaryotic cell or a eukaryotic cell. Each cell is numbered.



(Not to scale)

Which two cells should be classified as prokaryotic cells?

A. 1 and 2

B. 1 and 3

C. 2 and 4

D. 3 and 4

37. Which of the following organisms is a prokaryote?

A. *Agaricus arvensis*, horse mushroom

B. *Rhizopus stolonifer*, bread mold fungus

C. *Saccharomyces cerevisiae*, baker's yeast

D. *Thiopedia rosea*, purple sulfur bacterium

38. A student views cells from several different prokaryotic and eukaryotic organisms under a high-powered microscope.

Which of the following statements describes how the prokaryotic cells appear different from the eukaryotic cells?

A. The prokaryotic cells are much larger.

B. The prokaryotic cells do not have nuclei.

C. The prokaryotic cells have mitochondria.

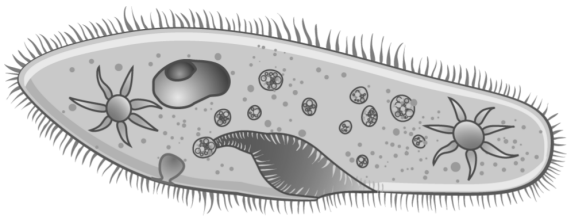
D. The prokaryotic cells have a less distinct shape.

39. Which of the following organisms has the simplest cellular structure?

A. bacterium B. earthworm

C. mushroom D. sunflower

40. A single-celled organism that a student observed under a microscope is shown below.



Which of the following statements *best* describes this organism?

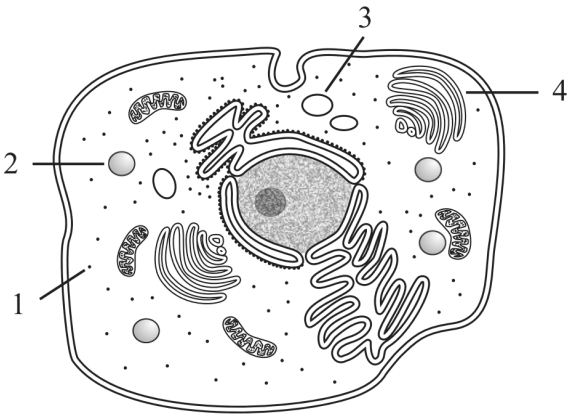
A. The organism is eukaryotic because it has a plasma membrane.

B. The organism is prokaryotic because it can reproduce asexually.

C. The organism is prokaryotic because it can synthesize its own food.

D. The organism is eukaryotic because it has membrane-bound organelles.

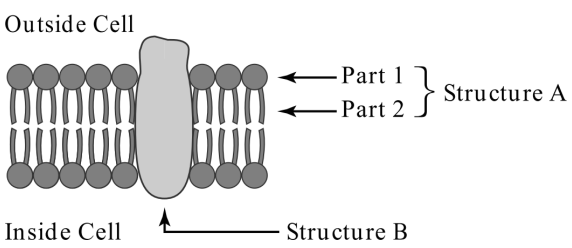
41. The diagram below shows a cell with four of its parts numbered.



Which numbered part is a ribosome?

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

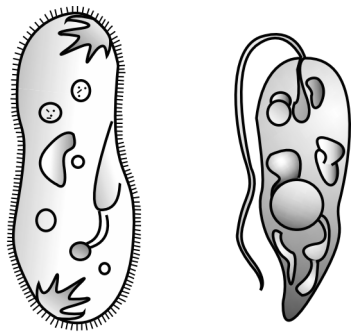
42. Use the figure of a cell membrane below to answer the following question(s).



What kind of molecule is Structure A?

A. an amino acid
B. a phospholipid
C. a carbohydrate
D. a nucleic acid

43. Refer to the diagram below of the single-celled, eukaryotic organisms to answer the following question(s).



Paramecium *Euglena*

Euglena uses which of these to move?

A. cilia
B. a vacuole
C. a flagellum
D. pseudopodia

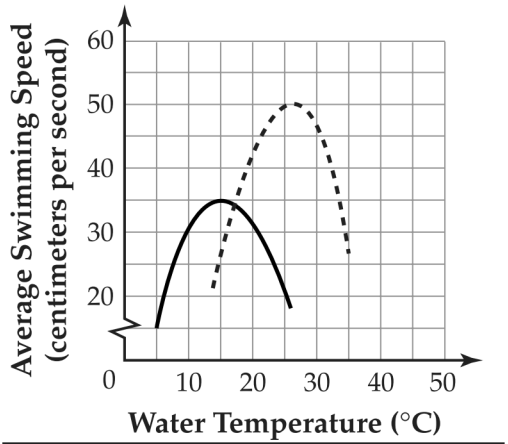
44. Which of these organelles in animal cells provide energy for cell activities?

A. mitochondria
B. chloroplasts
C. ribosomes
D. nuclei

45. Use the information and the graph below to answer the following question(s).

Scientists wanted to study the effect of water temperature on the swimming speed of goldfish. They set up an experiment in which they raised populations of goldfish in two different aquariums. Population 1 was raised at 5° C. Population 2 was raised at 25° C. All other variables were constant in both aquariums. The results of this experiment are shown in the graph below.

SWIMMING SPEEDS OF TWO GOLDFISH POPULATIONS



Which of these is *most* affected in the cells of the goldfish when the water temperature is lowered?

A. enzyme activity

B. pH level

C. DNA base sequence

D. salt concentration

46. Use the information below to answer the following question(s).

Scientists have recently discovered a new species that lives attached to the side of a tree. An organism from this new species

- is multicellular
- has cell walls
- has vascular tissues
- makes its own food
- has structures that absorb moisture from the air

Which of these is *not* true about cells in the new organism?

A. They contain nuclei.

B. They use vacuoles for storage.

C. They contain mitochondria.

D. They use pseudopodia to move.

47. Which of these is the process by which water moves across a selectively permeable membrane?

A. osmosis B. transpiration

C. capillary action D. active transport

48. Cyanide is a poison that prevents mitochondria from using oxygen. As a result, the mitochondria *cannot* produce

A. lipids B. sugar

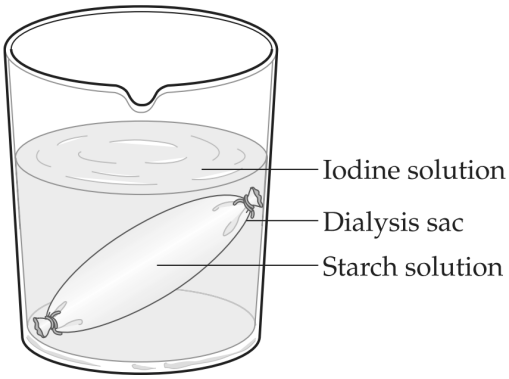
C. minerals D. energy

49. Maryland white oak trees make their own food. Their cells contain structures that capture energy from the sun. What are these structures?

A. chloroplasts
B. nuclei
C. mitochondria
D. ribosomes

50. Use the information and the diagram below to answer the following question(s).

Starch turns blue-black in the presence of iodine solution. A selectively permeable dialysis sac containing a starch solution is placed into a beaker of iodine solution.



If the dialysis sac is permeable *only* to water and iodine, what will the solutions in the beaker and the sac look like after two hours?

A. The iodine solution in the beaker will turn blue-black; the starch solution will not change.
B. The starch solution in the dialysis sac will turn blue-black; the iodine solution will not change.
C. Neither solution will turn blue-black.
D. Both solutions will turn blue-black.

51. Which of these processes is demonstrated by the experiment shown in the diagram?

A. cellular respiration
B. active transport
C. endocytosis
D. diffusion

52. Which of these substances moves across cell membranes by osmosis?

A. salt
B. sugar
C. water
D. protein

53. A scientist removed the cell membranes from bacteria cells in a culture. She analyzed the cell membranes for specific molecules. Which of these was probably the *most* common type of molecule present in the bacteria cell membranes?

A. lipid
B. amino acid
C. nucleic acid
D. carbohydrate

54. Which cell structure contains molecules that direct cell activities?

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

55. Some cells have many short, hairlike structures on their surfaces. These structures are used *mainly* for

A. cell movement
B. DNA replication
C. energy production
D. waste removal

56. Use the information below to answer the following question(s).

A particular toxin prevents cellular production of usable energy. Cells that are affected by this toxin are unable to carry out many of their normal functions.

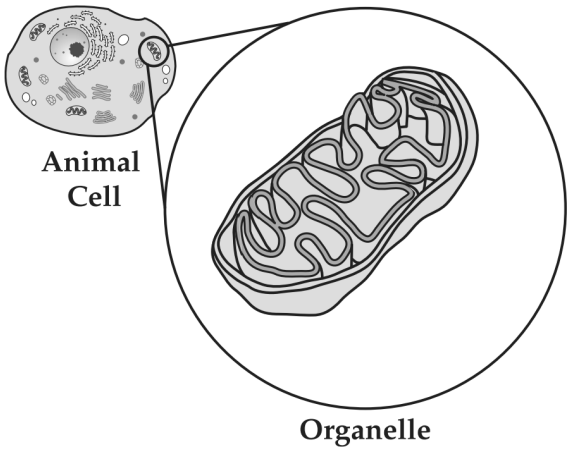
Which of these organelles would be most *directly* harmed by this toxin?

A. ribosomes
B. the nucleus
C. mitochondria
D. the vacuole

57. Use the information and diagram below to answer the following question(s).

Animal cells contain an organelle that helps release energy. A diagram of this organelle is shown below.

ANIMAL CELL DIAGRAM



What is the organelle described?

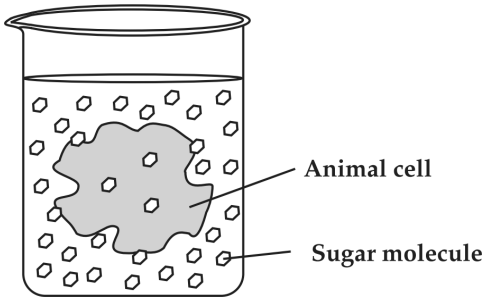
A. chloroplast
B. mitochondrion
C. nucleus
D. ribosome

58. Which function would the energy-releasing organelle *most likely* have in the animal cell?

A. cellular control
B. cellular respiration
C. removal of wastes
D. storage of nutrients

59. The diagram below shows an animal cell in a beaker containing a solution of sugar and water. The cell membrane is permeable only to water.

ANIMAL CELL IN SUGAR AND WATER SOLUTION



Which statement describes the relationship between the animal cell and the contents of the beaker?

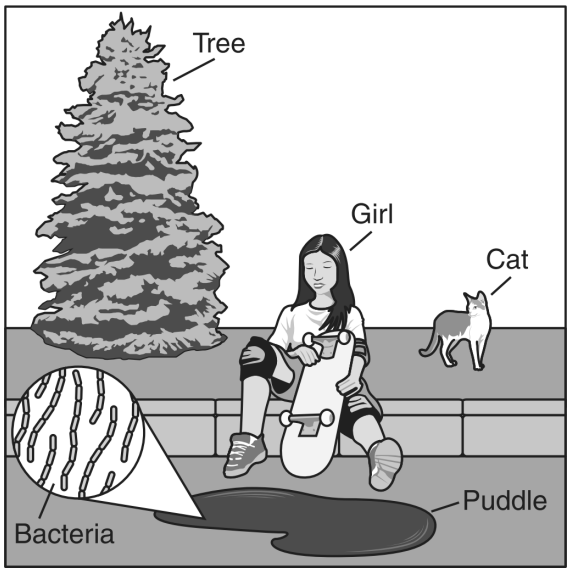
A. There is a higher concentration of water inside the cell than outside the cell.

B. There is a higher concentration of sugar inside the cell than outside the cell.

C. There is an equal concentration of water inside the cell as outside the cell.

D. There is an equal concentration of sugar inside the cell as outside the cell.

60. Several organisms are shown in the picture below.



Which organism in the picture is a single-celled organism?

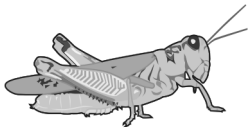
A. tree

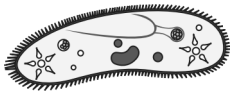
B. bacteria

C. girl

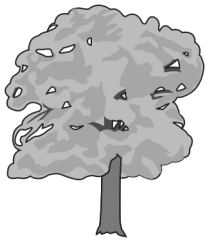
D. cat

61. Which organism has only one cell?

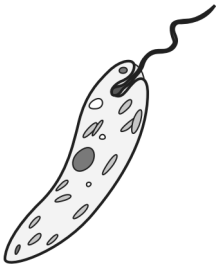
A. 
Grasshopper

B. 
Paramecium

C. 
Mushroom

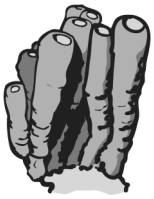
D. 
Tree

62. Which organism is made of one cell?

A. 

B. 

C. 

D. 

63. Unicellular organisms carry out all the necessary life processes in one cell. In multicellular organisms, each cell is specialized to perform a specific function. How do the cells in multicellular organisms become specialized?

A. Cells develop specific functions through the expression of different genes as they mature.

B. A single nucleus coordinates the function performed by each cell.

C. The brain communicates the function required for each cell.

D. Each cell carries a unique set of genes.

64. What is the *main* function of a selectively permeable cell membrane?

A. storage of water

B. storage of chemicals

C. breaks down molecules within the cell

D. regulates what enters and leaves the cell

65. Which of these would be *least likely* to diffuse across the phospholipid bilayer of a cell membrane?

A. water

B. oxygen

C. sodium ions

D. carbon dioxide

66. Sid is observing an unknown cell under a microscope. The presence of which structure would help him determine if the cell was from a plant or from an animal?

A. Nucleus

B. Cell wall

C. Ribosomes

D. Cell membrane

67. Which statement explains why the nucleus can be referred to as the brain of plant and animal cells?

A. It releases energy to the cell.

B. It controls the activities of the cell.

C. It stores food, water, and wastes of the cell.

D. It controls the materials that go into and out of the cell.

68. Which of these is found in the nucleus of plant and animal cells?

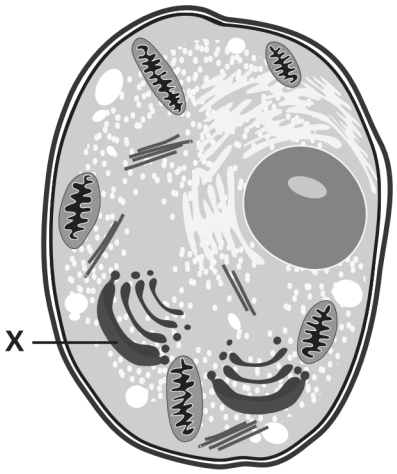
A. Vacuoles

B. Cytoplasm

C. Mitochondria

D. Chromosomes

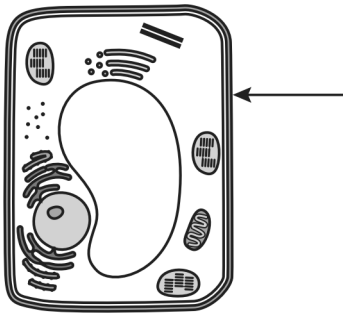
69. The following diagram shows an animal cell.



What is structure X?

A. Nucleus
B. Chloroplast
C. Cell membrane
D. Golgi apparatus

70. Nate used a microscope to view a cell. He drew the following sketch with an arrow pointing to an unknown structure.



Which of these describes the unknown structure in Nate's sketch?

A. Vacuole in a plant cell
B. Nucleus in an animal cell
C. Cell wall around a plant cell
D. Cell membrane around an animal cell

71. Which statement describes how a single-celled organism helps make a food product?

A. Viruses that cause diseases are weakened and used to make vaccines.
B. Yeast changes carbohydrates into carbon dioxide to make dough rise.
C. Fungi release a chemical that keeps bacteria colonies from growing larger.
D. Bacteria eat oil spilled in rivers and change it into less dangerous compounds.

72. A human red blood cell normally contains 0.9% salt. Which of the following solutions is hypotonic to red blood cells?

A. 0.1 % B. 0.9 % C. 1.0 % D. 1.9 %

73. The plasma membrane of a cell is selectively permeable, which means it—

A. controls all cellular activities.

B. is responsible for asexual reproduction.

C. allows some materials to pass.

D. has a carbohydrate foundation.

74. Some ribosomes float freely in the cytoplasm, while others are attached to the—

A. Golgi bodies.

B. endoplasmic reticulum.

C. chromosomes

D. nucleus.

75. The salivary glands of animals release secretions from simple proteins that are packaged in each cell's—

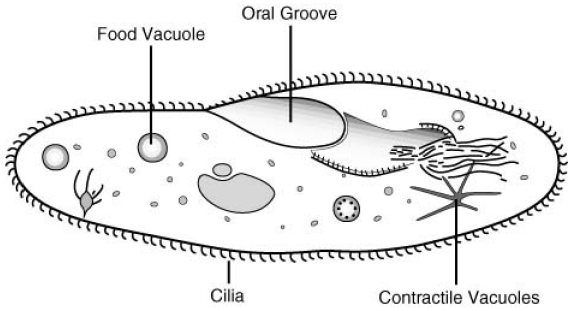
A. nucleus.

B. lysosomes.

C. endoplasmic reticulum.

D. Golgi bodies.

76.

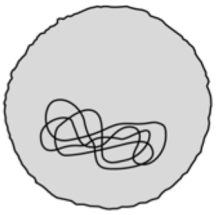


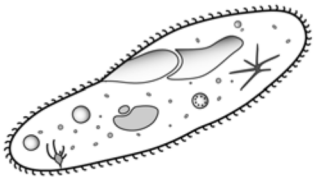
Which organelle below reduces the effects of osmosis in this type of protozoan?

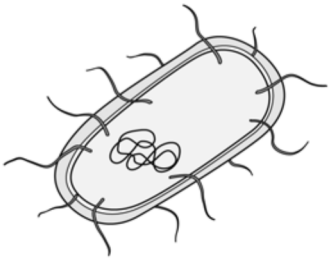
A. Contractile vacuole B. Food vacuole

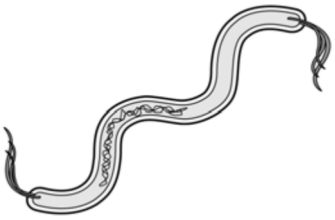
C. Cilia D. Oral Groove

77. Which of the following organisms is a eukaryotic cell?

A. 

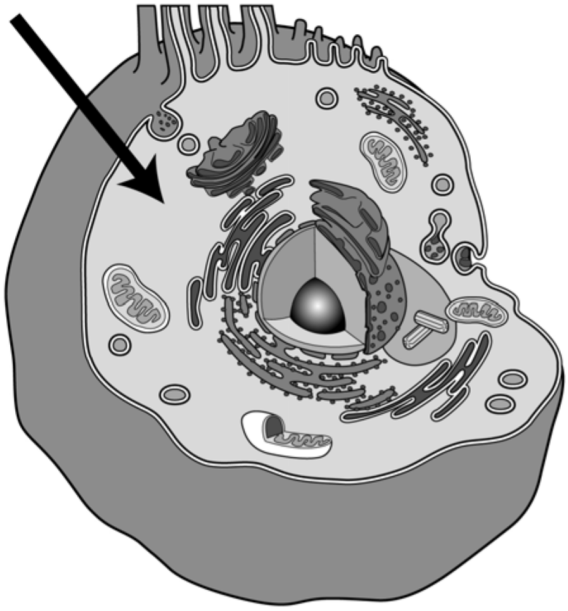
B. 

C. 

D. 

78. The channels in cell membranes that help substances to move in and out of cells during active transport are made of—

A. protein.
B. chlorophyll.
C. cytoplasm.
D. carbohydrates.

79. 

The part of the cell marked by the arrow is the—

A. cytoplasm.
B. chloroplast.
C. mitochondrion.
D. chlorophyll.

80. The building of proteins from amino acids occurs on the cell's—

A. membrane.
B. ribosomes.
C. nucleus.
D. centriole.

81. Materials can be moved around within a cell by using the—

A. golgi bodies.

B. ribosomes.

C. endoplasmic reticulum.

D. mitochrondrion.

82. What structure could a cellular organism use to move through its environment?

A. Flagellum B. Cell wall

C. Mitochondrion D. Lysosome

83. Jack bought a small turtle. Three months later, the turtle had grown to twice its original size. Which of the following statements *best* describes why Jack's turtle got bigger?

A. Parts of the turtle stretched out as it grew larger.

B. The number of cells in the turtle's body increased.

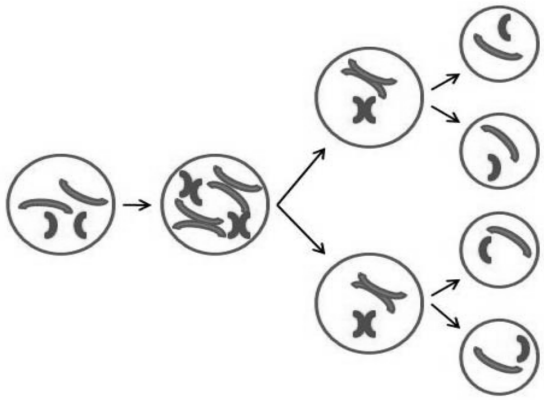
C. The turtle's body absorbed the food it ate and water it drank.

D. The size of each cell in the turtle's body got bigger as it got older.

84. The genome of a goldfish contains 96 chromosomes. How many chromosomes will each daughter cell have after mitosis of a goldfish cell is complete?

A. 24 B. 48 C. 96 D. 192

85. The distribution of chromosomes in one type of cell division is shown in the diagram below.



Which process and type of resulting cells are represented in the diagram?

A. mitosis, which produces gametes

B. mitosis, which produces body cells

C. meiosis, which produces gametes

D. meiosis, which produces body cells

86. Which of the following produces identical nuclei in cells?

A. pollination
B. mitosis
C. osmosis
D. fertilization

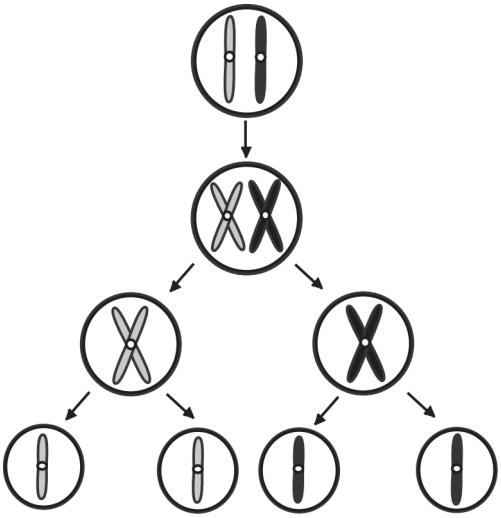
87. Which of the following cell types is formed by meiosis?

A. muscle cells
B. sperm cells
C. skin cells
D. blood cells

88. What process is necessary for the inherited traits of an organism to be passed along by sexual reproduction?

A. mitosis
B. meiosis
C. mutation
D. fission

89. The diagram below shows a cellular process that occurs in organisms.

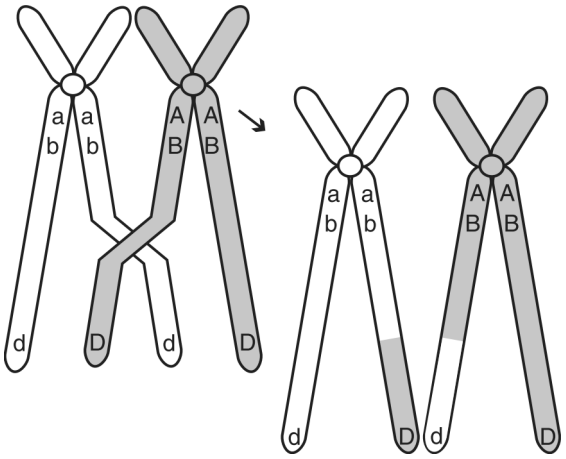


This process is known as

A. meiosis.
B. mitosis.
C. endocytosis.
D. phagocytosis.

90. Which of the following statements correctly describes meiosis?

A. Cells divide only once during meiosis.
B. Meiosis does not occur in reproductive cells.
C. The cells produced at the end of meiosis are genetically identical to the parent cell.
D. The cells produced at the end of meiosis contain half the number of chromosomes as the parent cell.

91. 

The diagram above shows homologous chromosomes during prophase I of meiosis. Which of the following correctly describes the process being illustrated?

A. mutation in which the DNA content of the gene is altered

B. segregation of sister chromatids

C. condensation and segregation of alleles

D. crossing-over in which alleles are exchanged

92. Which of the following sequences represents chromosome number during fertilization?

A. $n + n \rightarrow 2n$ B. $2n \rightarrow n + n$

C. $n \rightarrow n$ D. $2n \rightarrow 2n$

93. The table below lists the typical diploid number of chromosomes of several different organisms.

Diploid Chromosome Number

Goldfish	94
Potato	48
Human	46
Pea	14
Fruit fly	8

Which of the following is the *best* explanation for why the chromosome number is an even number in each of these organisms?

A. It is only a coincidence; many other organisms have an odd number of chromosomes.

B. The diploid chromosome number is always even so that when mitosis occurs each new cell gets the same number of chromosomes.

C. The diploid chromosome number represents pairs of chromosomes, one from each parent, so it is always an even number.

D. Chromosomes double every time the cell divides, so after the first division, the number is always even.

94. Based only on the sex chromosomes in typical human egg and sperm cells at fertilization, the probability of producing a female is

A. 25%. B. 50%. C. 75%. D. 90%.

95. Mendel hypothesized that reproductive cells have only one factor for each inherited trait. This hypothesis is supported by the observation that

A. haploid cells are produced by mitosis.

B. diploid cells are produced by mitosis.

C. haploid cells are produced by meiosis.

D. diploid cells are produced by meiosis.

96. If an intestinal cell in a butterfly contains 24 chromosomes, a butterfly egg cell would contain

A. 3 chromosomes. B. 6 chromosomes.

C. 12 chromosomes. D. 24 chromosomes.

97. In humans, sex cells are produced by a different process than other body cells.

How is the process used to produce sex cells different from the process used to produce body cells?

A. Only the process used to make sex cells uses spindle fibers,

B. Only the process used to make sex cells produces haploid cells.

C. Only the process used to make sex cells can result in mutations.

D. Only the process used to make sex cells requires DNA replication.

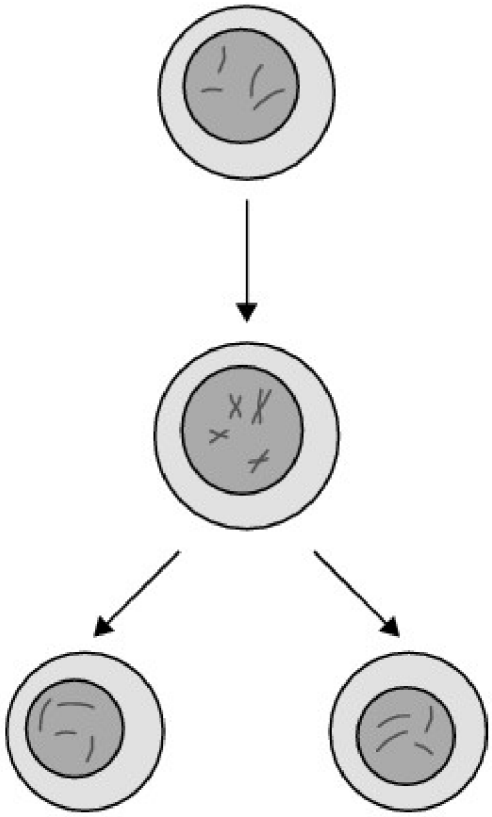
98. A male shark has 40 chromosomes in each of its sex cells.

How many chromosomes would be present in a normal body cell of a shark?

A. 20 B. 40 C. 80 D. 160

99. The diagram shows a cellular process.

How is this process used in the bodies of male animals?



A. To produce sperm cells

B. To produce DNA sequences

C. To produce white blood cells

D. To produce digestive enzymes

100. Trisomy 21 is a genetic disorder in which an individual has an extra copy of chromosome 21?

Which process could cause trisomy 21?

A. Failure of a chromosome to replicate during mitosis

B. Failure of chromosome pairs to join during fertilization

C. Failure of a chromosome to cross over during replication

D. Failure of chromosome pairs to separate properly during meiosis

101. A liver cell in a mouse goes through cell division, and one of the resulting daughter cells contains a new mutation.

What could result from this mutation?

A. The new liver cell could die.

B. The new liver cell could undergo meiosis.

C. The new mutation could be passed on to the mouse's offspring.

D. The new mutation could spread to the mouse's reproductive cells.

102. A student uses a microscope to observe cells in the root tissue of an onion. He concludes that the cells are reproducing by mitosis.

Which hypothesis is supported by his conclusion?

A. The root tissue cells all have the same set of chromosomes.

B. The root tissue cells each have a unique genetic make-up.

C. The root tissue cells produce identical gametes.

D. The root tissue cells split to form stem cells.

103. All living things contain which element?

A. helium B. sodium

C. copper D. carbon

104. Plants and animals are composed of organic compounds. Which of the following are the common elements found in organic compounds?

A. iron, oxygen, nickel, copper

B. sodium, potassium, gold, hydrogen

C. helium, neon, argon, krypton

D. carbon, hydrogen, oxygen, nitrogen

105. Which of the following elements is *best* able to combine with itself and hydrogen (H) to form large molecules?

A. sodium (Na)
B. lithium (Li)
C. sulfur (S)
D. carbon (C)

106. Which of the following compounds is *most* likely to be part of living organisms?

A. $C_6H_{12}O_6$
B. BF_3
C. $MoCl_2$
D. CsI

107. Which of the following is the fundamental element found in all living organisms?

A. iron
B. carbon
C. calcium
D. magnesium

108. There are many different enzymes located in the cytoplasm of a single cell. How is a specific enzyme able to catalyze a specific reaction?

A. Different enzymes are synthesized in specific areas of the cytoplasm.
B. Most enzymes can catalyze many different reactions.
C. An enzyme binds to a specific substrate (reactant) for the reaction catalyzed.
D. Enzymes are transported to specific substrates (reactants) by ribosomes.

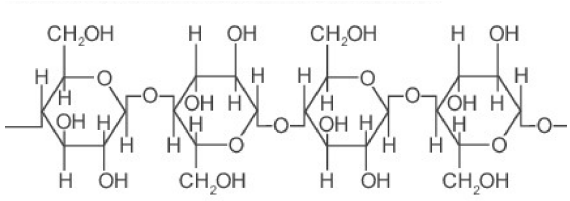
109. Some snake venoms are harmful because they contain enzymes that destroy blood cells or tissues. The damage caused by such a snakebite could *best* be slowed by

A. applying ice to the bite area.
B. drinking large amounts of water.
C. inducing vomiting.
D. increasing blood flow to the area.

110. What types of monomers form proteins?

A. Glucose
B. Nucleotides
C. Amino acids
D. Polyatomic ions

111. The structural formula of cellulose is shown.



Which phrase correctly describes cellulose?

A. A polymer made of glucose

B. A branched form of sucrose

C. A disaccharide

D. A simple sugar

112. Carbohydrates are macromolecules used for energy in living organisms. Large carbohydrate molecules are made of smaller building blocks called monosaccharides.

The arrangement of which three components is used to distinguish one monosaccharide from another?

A. Carbon, hydrogen, and oxygen

B. Glucose, fructose, and ribose

C. Peptide, fatty acid, and purine

D. Water, carbon dioxide, and nitrogen

113. Use the pictures below to answer the question.

Which shows the correct order from simplest to most complex?

A. Cell → Tissue → Organ

B. Organ → Tissue → Cell

C. Cell → Organ → Tissue

D. Tissue → Organ → Cell

114. Many aquatic birds secrete waxy organic substances that repel water. The birds use these substances to coat their feathers. An analysis of these substances would reveal that they are composed mostly of

A. lipids.

B. proteins.

C. carbohydrates.

D. nucleic acids.

115. The table below shows the elemental composition of three different types of organisms.

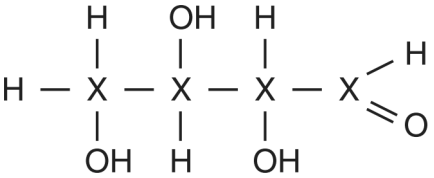
Elemental Composition of Selected Organisms (percent by weight)

Element	Human	Alfalfa	*E.coli* Bacterium
O	65.0	77.9	73.7
C	18.5	11.3	12.1
H	9.5	8.7	9.9
X	3.3	0.8	3.0
P	1.0	0.7	0.6
S	0.3	0.1	0.3
Total	97.6%	99.5%	99.6%

The X in the table represents which of the following elements?

A. calcium (Ca)
B. iron (Fe)
C. nitrogen (N)
D. sodium (Na)

116. The structure of an organic molecule is represented below.



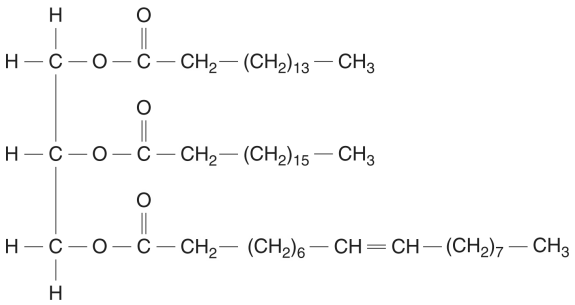
In this organic molecule, which element is identified by each X?

A. iron
B. carbon
C. sodium
D. phosphorus

117. The molecule ATP is composed of elements commonly found in organic molecules. Which of the following is one of these elements?

A. aluminum
B. calcium
C. phosphorus
D. tin

118. The diagram below represents a fat molecule.



A fat molecule belongs to which category of organic molecules?

A. proteins
B. lipids
C. nucleic acids
D. carbohydrates

119. If scientists search other planets for possible life, they are likely to focus on the presence of molecules containing which of the following elements?

A. carbon
B. iron
C. potassium
D. sodium

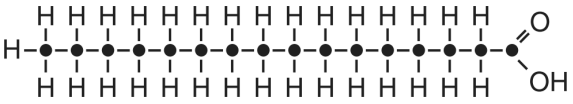
120. In red blood cells, the compound carbonic anhydrase increases the rate at which carbon dioxide is converted to bicarbonate ions for transport in the blood. In red blood cells, carbonic anhydrase acts as which of the following?

A. an enzyme
B. a hormone
C. a lipid
D. a sugar

121. Many plants have waxy coatings on some surfaces. This coating reduces water loss because it is not water-permeable. This waxy coating is which of the following types of organic molecule?

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

122. A diagram of an organic molecule is below.



Which element is found at the positions marked by the dots (•) in the molecule?

A. carbon
B. nitrogen
C. phosphorus
D. sulfur

123. One category of organic compounds contains molecules composed of long hydrocarbon chains. The hydrocarbon chains may be saturated or unsaturated.

Which of the following categories of organic compounds contains these molecules?

A. carbohydrates
B. lipids
C. nucleic acids
D. proteins

124. Which of the following categories of organic molecules is correctly paired with one of its functions?

A. nucleic acids—digest dead cells
B. lipids—give quick energy to cells
C. carbohydrates—store genetic information
D. proteins—provide structure in skin, hair, and nails

125. Energy for most chemical reactions in cells is supplied by which of the following molecules?

A. ATP
B. DNA
C. adrenaline
D. hemoglobin

126. Which of the following *best* describes the composition of a nucleotide?

A. a pair of six-carbon rings attached to each other

B. a carbon atom joined to hydrogen and three functional groups

C. a chain of carbon atoms with a carboxyl group bonded to one end

D. a five-carbon sugar attached to a phosphate group and a nitrogenous base

127. Acetylcholine is an important chemical signal in the nervous system. Once acetylcholine is released, it is quickly broken down into other chemicals because of the activity of cholinesterase.

Cholinesterase is which of the following?

A. a hormone

B. a lipid

C. an enzyme

D. an organelle

128. Which of the following *best* explains why enzymes are necessary for many cellular reactions?

A. Enzymes supply the oxygen necessary for the reactions.

B. Enzymes change reactants from solid to liquid during the reactions.

C. The reactions take up too much space in the cell if enzymes are missing.

D. The reactions are too slow to meet the needs of the cell if enzymes are missing.

The following section focuses on different lemur species of Madagascar.

Madagascar is an island located off the east coast of Africa, as shown on the map below.

Madagascar has a unique animal community. Lemurs are one of the animal groups that have diversified extensively on Madagascar. Lemurs are primates, which is an order of mammals that also includes monkeys and apes. Lemur species vary widely in habitat, diet, size, and color. Lemurs only live on the island of Madagascar. However, fossil evidence shows that lemur ancestors existed on Africa's mainland. Scientists hypothesize that lemur ancestors reached Madagascar by floating across the Mozambique Channel on matted clumps of vegetation.

Four different lemur species are shown in figures 1–4 below.

Figure 1. Mouse lemur

Length: 12.5 cm

Habitat: Rain forest and deciduous forest

Figure 2. Verreaux's sifaka

Length: 45 cm–55 cm

Habitat: Spiny deciduous forest and evergreen forest

Figure 3. Ring-tailed lemur

Length: 38 cm–46 cm

Habitat: Deciduous forest and scrub forest

Figure 4. Red-bellied lemur

Length: 36 cm–54 cm

Habitat: Rain forest

129. Lemurs' bodies are adapted to efficiently store energy for times when food is scarce. This adaptation may help to explain how lemur ancestors survived the trip across the Mozambique Channel from mainland Africa to Madagascar.

Which of the following types of molecules are primarily used for long-term energy storage in the lemur?

A. lipids
B. monosaccharides
C. nucleic acids
D. proteins

130. In the human body, fibrinogen is necessary for sealing cuts and stopping the loss of blood. Since fibrinogen is made of chains of amino acids, it is an example of which type of organic molecule?

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

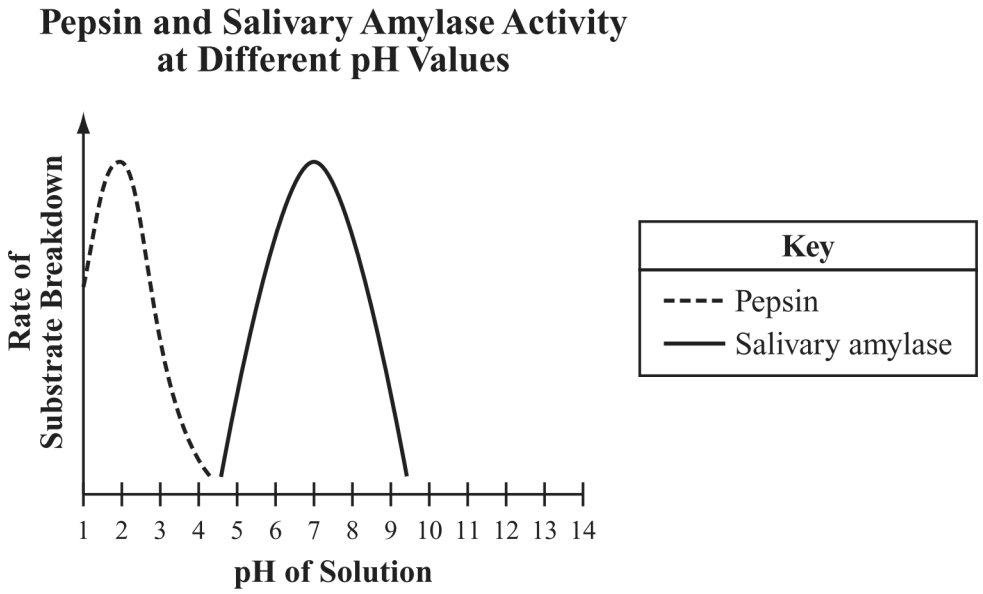
131. All organisms have ways to produce ATP. Which of the following statements describes why ATP is a critical compound for all cells?

A. It causes mitosis to begin.
B. It is an energy-transfer molecule.
C. It is a major component of cell membranes.
D. It carries information from DNA to the ribosomes.

Biology students investigated various human digestive enzymes. The table below summarizes the functions of several different digestive enzymes.

Enzyme	Function
salivary amylase	begins to break down starch into smaller polysaccharides or the disaccharide maltose
pepsin	begins to break down proteins into small polypeptides
pancreatic amylase	continues to break down starch and smaller polysaccharides into disaccharides
lipase	breaks down fats into glycerol, fatty acids, or glycerides
aminopeptidase	breaks down small polypeptides into amino acids

The students conducted experiments to study digestive enzyme activity. In the first experiment, the students observed the rate at which salivary amylase breaks down starch (the substrate) in solutions with different pH values. The students then performed the same type of experiment with pepsin. The graph below shows the students' results for the two experiments.



132. Salivary amylase breaks down which class of organic molecules?

A. carbohydrates
B. lipids
C. nucleic acids
D. proteins

133. Which of the following statements *best* describes an effect of pH on the functioning of salivary amylase?

A. Salivary amylase functions most effectively at a pH of about 4.

B. Salivary amylase functions most effectively at a pH of about 7.

C. Salivary amylase cannot break down starch into maltose at pH values less than 7.

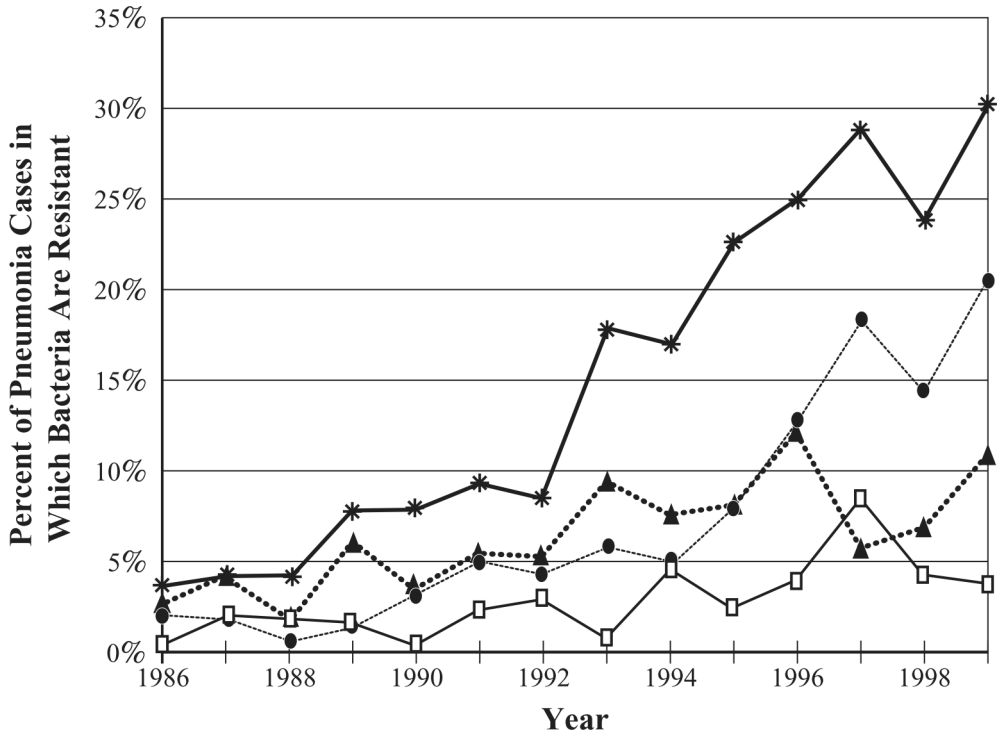
D. Salivary amylase breaks down protein instead of starch at pH values greater than 9.

The following section focuses on bacterial resistance to several antibiotics.

One of the most important developments in modern medicine was the discovery of antibiotics. Antibiotics are used to treat infections caused by bacteria. However, strains of bacteria that are resistant to antibiotics are emerging. The rate of increase in infections caused by these antibiotic-resistant strains of bacteria is a concern for human health.

The bacterium *Streptococcus pneumoniae* is a major cause of the respiratory disease pneumonia. The graph below shows trends in bacterial resistance to different antibiotics in pneumonia cases from 1986 to 1999.

Trends in Bacterial Resistance



Key
Types of Antibiotics
Erythromycin — Tetracycline
Penicillin — Trimethoprim/ Sulfamethoxazole

134. Resistance to antibiotics results from variations in the genetic code of *Streptococcus pneumoniae*. Which type of molecule encodes genetic information in *Streptococcus pneumoniae*?

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

135. Which of the following statements describes a DNA molecule?

A. It contains the base uracil.
B. It has a double helix shape.
C. It contains five phosphate groups per nucleotide.
D. It has a backbone of twenty different nucleotides.

136. The diagram below shows a pair of DNA nucleotides. The nitrogenous base guanine (**G**) is labeled.

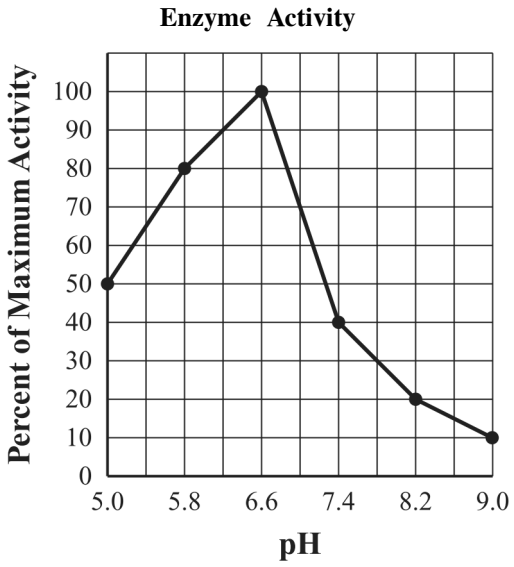
Which nitrogenous base pairs with guanine?

A. adenine (**A**)
B. cytosine (**C**)
C. thymine (**T**)
D. uracil (**U**)

137. A student is preparing to run in a school track competition. For the quickest source of energy, the student should eat a food that contains a high percentage of

A. carbohydrates.
B. fat.
C. proteins.
D. sodium.

138. The graph below shows how the activity of an enzyme changes over a range of pH values.



Which of the following conclusions is supported by the data?

A. The optimum pH of the enzyme is 6.6.
B. The optimum pH of the enzyme is 5.8.
C. The enzyme's activity is greater around pH 8.0 than around pH 5.0.
D. The enzyme's activity continually increases as pH increases from 5.0 to 9.0.

139. The table below provides information about the composition and function of four important molecules in living organisms.

Molecule	Composition	Function
1	amino acids	reaction catalyst
2	fatty acids	membrane component
3	monosaccharides	energy source
4	nucleotides	genetic information

Which of the molecules in this table is a carbohydrate?

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

140. A single nucleotide of DNA is composed of which of the following substances?

A. adenine, guanine, and cytosine

B. hydrogen, a phosphate group, and adenine

C. ribose sugar, deoxyribose sugar, and thymine

D. deoxyribose sugar, a phosphate group, and a nitrogenous base

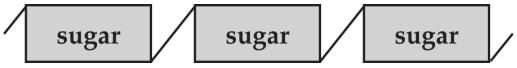
141. A dog gets many nutrients from its food including amino acids. Which of these can be built directly using the amino acids?

A. proteins B. carbohydrates

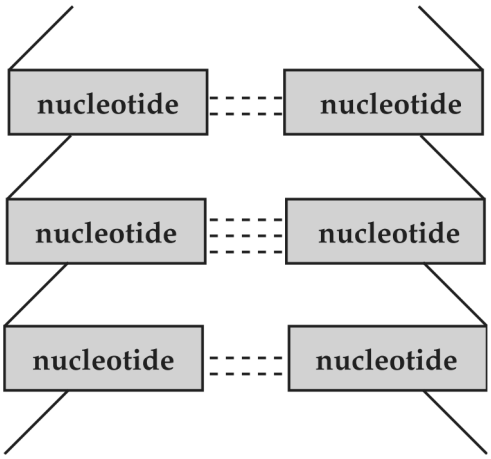
C. lipids D. minerals

142. Amylase is an enzyme that allows the human body to digest starch. Which of these diagrams *best* represents part of the structure of amylase?

A.

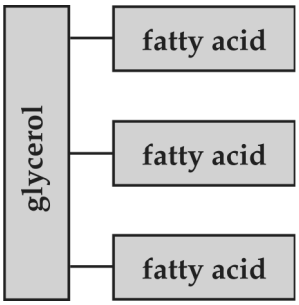


B.



C.

D.



143. Most carbohydrates in the human body are

A. used as building blocks for proteins

B. used as catalysts for reactions in cells

C. consumed as a source of energy

D. not easily absorbed into the bloodstream

144. Glucose is a building block of carbohydrates. Which of these *best* describes glucose?

A. nucleotide
B. protein
C. monosaccharide
D. lipid

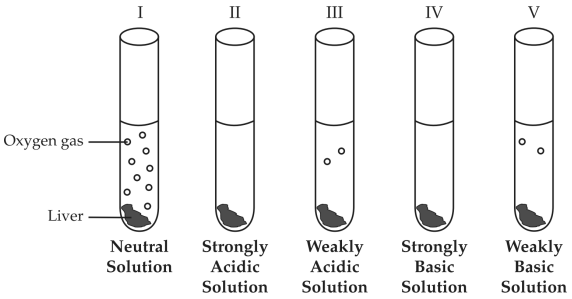
145. Which of these correctly matches the molecule with its function?

A. lipid–stores genetic information
B. vitamin–supplies energy to cells
C. enzyme–speeds up chemical reactions
D. carbohydrate–manufactures cell membranes

146. Use the information and the diagram below to answer the following question(s).

Catalase is an enzyme found in the tissues of plants and animals, including humans. Catalase helps prevent a toxic buildup of hydrogen peroxide in cells by breaking it down into water and oxygen gas. Several students conduct an experiment to test the effects of pH on the activity of catalase. Each test tube contains a solution of hydrogen peroxide and water at various pH levels. The liver tissue is a source of catalase. The diagram below represents the results of their experiment.

CATALASE EXPERIMENT



Which of the following are the building blocks of catalase?

A. monosaccharides
B. nucleic acids
C. vitamins
D. amino acids

147. The characteristics listed below can be used to describe some molecules.

1. inorganic
2. supplies energy and fiber
3. component of plant cell walls
4. part of DNA
5. made of nucleotides

Which of these sets of characteristics describes a carbohydrate?

A. 1-3-5 B. 2-3-4 C. 2-4-5 D. 1-3-4

148. Which of these correctly matches the molecule with its function?

A. lipid—stores genetic information

B. vitamin—supplies energy to cells

C. enzyme—speeds up chemical reactions

149. Which cell structure contains molecules that direct cell activities?

A. nucleus B. ribosome

C. mitochondrion

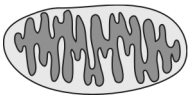
150. Which molecule changes as a result of a genetic engineering procedure?

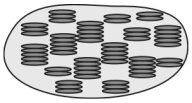
A. lipid B. carbohydrate

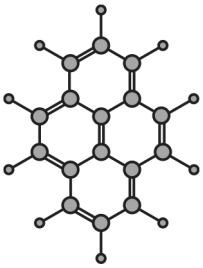
C. nucleic acid D. amino acid

151. Which of the following shows a DNA molecule?

A. 

B. 

C. 

D. 

152. A DNA molecule is shaped like a double helix, which looks like a twisted ladder.

DNA Model

Which of the following *best* describes the section of the ladder that contains a hereditary gene?

A. The top of the ladder

B. The bottom of the ladder

C. The vertical sides of the ladder

D. The horizontal sections of the ladder

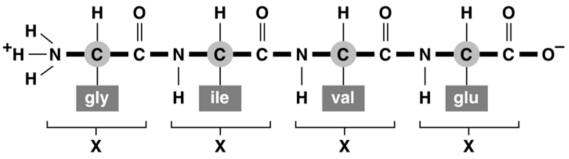
153. Cell walls are made of cellulose, a complex carbohydrate. Which of the following compounds is the basic unit of the cell wall?

A. Amino acids

B. Sugars

C. Lipids

D. Nucleic acids

154. 

A diagram of a protein molecule is shown above. The units labeled "X" which bond together to form the protein molecule are called—

A. amino acids.

B. fatty acids.

C. monosaccharides.

D. nucleotides.

155. Which of the following is a lipid?

A. Cholesterol

B. Cellulose

C. Glucose

D. Protein

156. Proteins are made of long chains of—

A. lipids.

B. monosaccharides.

C. amino acids.

D. enzymes.

157. Which of the following is needed to transfer and release energy?

A. Calcium

B. Phosphate

C. Nitrate

D. Potassium

158. All of the following are organic molecules *except*—

A. protein.
B. lipid.
C. carbohydrate.
D. salt.

159. Which of the following is *not* a carbohydrate?

A. Cellulose
B. Lipids
C. Monosaccharides
D. Starch

160. Proteins that regulate chemical reactions in the body but remain unchanged by the reaction are known as—

A. lymphocytes.
B. cytoplasm.
C. mitochondria.
D. enzymes.

161. All carbohydrates are made of—

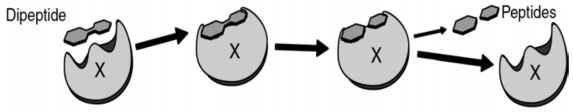
A. carbon, hydrogen, and oxygen.
B. glucose, sucrose, and fructose.
C. cellulose, glycogen, and starch.
D. guanine, alanine, and cytosine.

162. The glucose produced during photosynthesis is an example of a—

A. lipid.
B. monosaccharide.
C. protein.
D. nucleic acid.

163. Protein synthesis is a major function of living cells. The type of protein synthesized by a cell is determined by the sequence of—

A. carbohydrates.
B. amino acids.
C. lipids.
D. enzymes.

164. 

In the diagram above, the substance labeled X is *most* likely—

A. an enzyme.
B. water.
C. ATP.
D. oxygen.

165. Lipids are composed of fatty acids and—

A. proteins.
B. glycerol.
C. sugars.
D. alcohols.

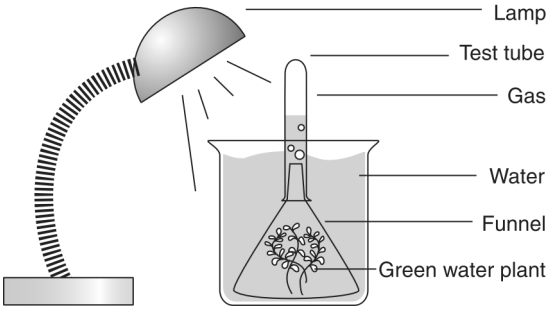
166. Which molecule supplies the energy for cellular functions?

A. ATP
B. oxygen
C. DNA
D. water

167. Which of the following gases do plants use in photosynthesis?

A. hydrogen
B. oxygen
C. carbon dioxide
D. carbon monoxide

168. **Photosynthesis Experiment**



Which gas is forming in the test tube shown above?

A. carbon dioxide
B. hydrogen
C. oxygen
D. nitrogen

169. Which of the following is broken down in the body to release energy?

A. sugar
B. water
C. salt
D. oxygen

170. Which of the following is produced when sugar is digested in an animal cell?

A. carbon dioxide
B. chlorophyll
C. oxygen
D. sunlight

171. During photosynthesis in plants, what is the source of the carbon in the sugar molecule ($C_6H_{12}O_6$)?

A. carbon dioxide in the air
B. carbon monoxide in the air
C. carbon particles in the soil
D. carbon particles in water

172. Which of the following processes allows the cells of an organism to use carbon from the environment?

A. mitosis
B. fertilization
C. transpiration
D. photosynthesis

173. Which molecule in plant cells first captures the radiant energy from sunlight?

A. glucose

B. carbon dioxide

C. chlorophyll

D. adenosine triphosphate

174. The first stage of photosynthesis in a chloroplast is

A. light-dependent.

B. temperature-dependent.

C. glucose-driven.

D. ATP-driven.

175. In aerobic respiration, the Krebs cycle (citric acid cycle) takes place in

A. chloroplasts.

B. nuclei.

C. lysosomes.

D. mitochondria.

176. Which of the following was made possible by the presence of photosynthetic bacteria on Earth?

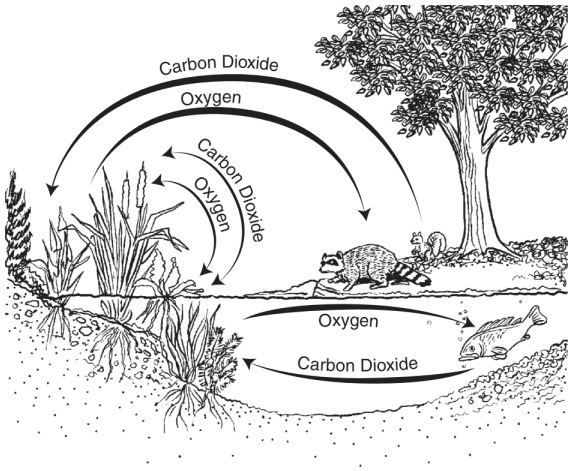
A. a water cycle

B. an oxygen cycle

C. carbon fixation

D. anaerobic respiration

177.



Which of these statements is *best* illustrated by this diagram?

A. Animals under water eat plants.

B. Land animals exhale oxygen into water.

C. Water-dwelling animals breathe carbon dioxide.

D. Plants can take in carbon dioxide from air or water.

178. Analysis of Gases From a Hawaiian Volcano

Gas	Amount
H_2O (steam)	79%
CO_2	12%
SO_2	6.5%
N_2	1.5%
H_2, CO, Cl_2, and Ar	trace

The table above lists the gases coming from a modern Hawaiian volcano. If ancient volcanoes gave off the same gases, which gas would have been *most* helpful in the development of early life-forms that could carry out photosynthesis?

A. N_2 B. SO_2 C. CO_2 D. Cl_2

179. **Photosynthesis**

The following equation represents the process of photosynthesis in green plants.

$$6CO_2 + 6H_2O \xrightarrow[\text{Chlorophyll}]{\text{Light}} C_6H_{12}O_6 + 6O_2$$

(Carbon Dioxide + Water, in the Presence of Light and Chlorophyll ⟶ Sugar + Oxygen)

What happens to most of the light energy during photosynthesis?

A. It is transformed into heat energy.

B. It is transformed into chemical energy.

C. It is changed into carbon dioxide.

D. It is changed into oxygen.

180. Which statement about green plants is true?

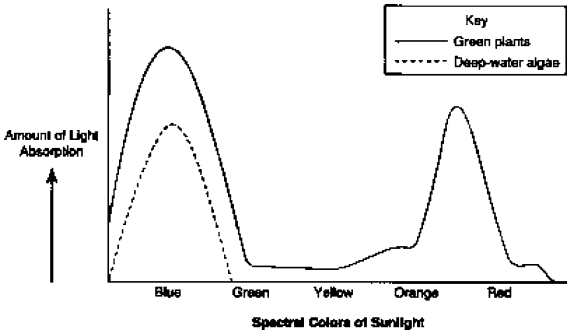
A. Most green plants do not need food.

B. Most green plants take in food through their roots.

C. Most green plants take in food through their leaves.

D. Most green plants manufacture their own food.

181.



Based on the above graph, deep-water algae probably _____.

A. have a higher rate of photosynthesis than green plants

B. can appear to be green, yellow, orange or red

C. reflect blue light

D. absorb orange light

182. The following equation represents the process of photosynthesis in green plants.

$$6C0_2 + 6H_20 \xrightarrow[\text{Chlorophyll}]{\text{Light}} C_6H_{12}0_6 + 60_2$$

(Carbon Dioxide + Water, in the Presence of Light and Chlorophyll → Sugar + Oxygen)

What happens to most of the light energy during photosynthesis?

A. It is transformed into heat energy.

B. It is transformed into chemical energy.

C. It is changed into carbon dioxide.

D. It is changed into oxygen.

183. A student picked up Ball A off a shelf and threw it. Which of the following would show the flow of energy from its source?

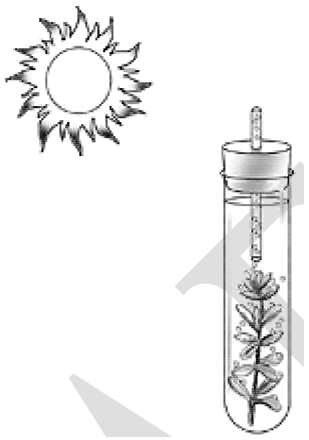
A. Light energy from the sun → chemical energy in food → chemical energy in the student → mechanical energy in the ball

B. Light energy from the sun → chemical energy in the student → chemical energy in food → mechanical energy in the ball

C. Chemical energy in the student → mechanical energy in the ball → chemical energy in food → light energy from the sun

D. Chemical energy in the student → chemical energy in food → mechanical energy in the ball → light energy from the sun 2002

184. A sprig of an Elodea plant was placed in a test tube as shown below. The test tube was then placed in sunlight for 6 hours.



The bubbles of gas in the diagram are composed mainly of

A. carbon monoxide B. carbon dioxide

C. nitrogen D. oxygen

185. In the process of photosynthesis, light energy is used to split water into hydrogen and oxygen. The hydrogen combines with carbon dioxide to ultimately produce _____.

A. glucose B. nitrates

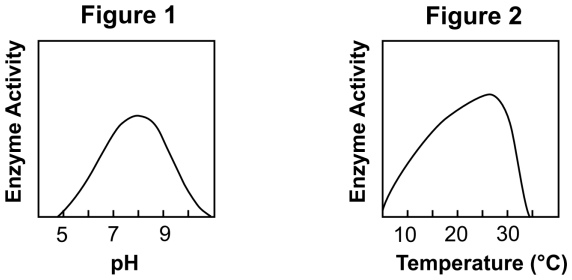
C. chlorophyll D. hydrogen peroxide

186. Plants, like all other organisms, are composed of cells.

A group of students placed spinach leaves in a beaker of water in full sunlight. After several hours, small bubbles appeared on the leaves. These bubbles probably consisted of _____.

A. H_2O B. O_2 C. CO_2 D. H_2

187. The figures below show the reaction rate of a specific enzyme at different temperatures and different pHs.



What can be concluded about the enzyme?

A. The enzyme works best at a pH of 8 and a temperature of 25°C.

B. The enzyme only works at a pH of 8 and a temperature of 25°C.

C. The enzyme is used up at a pH of 11 and a temperature of 35°C.

D. The enzyme works better at a pH of 8 than a temperature of 25°C.

188. In which part of a plant does photosynthesis take place?

A. bark B. flowers

C. leaves D. roots

189. Photosynthesis is a chemical reaction that converts

A. light energy into chemical energy.

B. heat energy into mechanical energy.

C. light energy into electrical energy.

D. heat energy into electrical energy.

190. Through cell respiration, plants get energy from glucose. The energy stored in glucose originally came from

A. plants. B. animals.

C. the sun. D. geothermal sources.

191. The process of cellular respiration occurs in

A. both plant and animal cells.

B. plant cells only.

C. animal cells only.

D. neither plant nor animal cells.

192. In the oxygen cycle, which group of organisms replenishes a large portion of the atmospheric oxygen supply?

A. mammals
B. fungi
C. insects
D. plants

193. **Use the information below to answer the following question.**

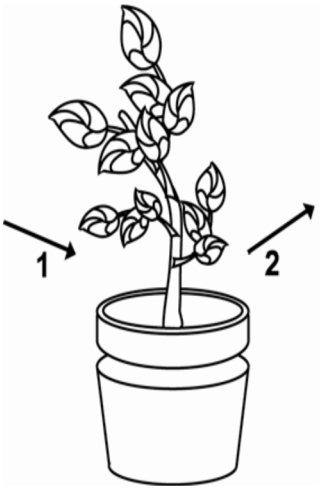
> Scientists believe that during its early formation, Earth's atmosphere contained little, if any, oxygen. Fossil and rock records suggest that by about two billion years ago, Earth's atmosphere was oxygen rich and that organisms with complex cells existed. Many scientists think that these organisms released oxygen, changing the composition of Earth's atmosphere.

Which process is the *most* scientifically plausible explanation for how the organisms released oxygen into Earth's atmosphere?

A. The cells produced sugar and oxygen during photosynthesis.
B. The cells gave off oxygen during cell division as they rapidly reproduced.
C. The cells broke down carbon dioxide to carbon and oxygen to obtain energy.
D. The cells combined nitrogen and hydrogen atoms by nuclear fusion to produce oxygen.

194. Use the diagram to answer the question.

Gases and Photosynthesis



The diagram shows the gases that enter and leave a plant during the process of photosynthesis. Which gases do arrows 1 and 2 represent?

A. Arrow 1 is nitrogen, and arrow 2 is oxygen.
B. Arrow 1 is oxygen, and arrow 2 is nitrogen.
C. Arrow 1 is oxygen, and arrow 2 is carbon dioxide.
D. Arrow 1 is carbon dioxide, and arrow 2 is oxygen.

195. What is the *main* reason humans need nitrogen to survive?

A. Nitrogen is used in respiration to generate energy.

B. Nitrogen is used in making the proteins in the body.

C. Nitrogen is used to help the body eliminate wastes.

D. Nitrogen is used by nerve cells to conduct impulses.

196. Which statement *best* describes the roles of photosynthesis and respiration in the carbon cycle?

A. Respiration and photosynthesis both add carbon to the atmosphere.

B. Respiration and photosynthesis both remove carbon from the atmosphere.

C. Respiration adds carbon to the atmosphere, while photosynthesis removes carbon from the atmosphere.

D. Photosynthesis adds carbon to the atmosphere, while respiration removes carbon from the atmosphere.

Task

The human body is very complex. Below is information about how parts of the human body function to keep a person alive. Read the information and study the diagrams. Then answer the following questions.

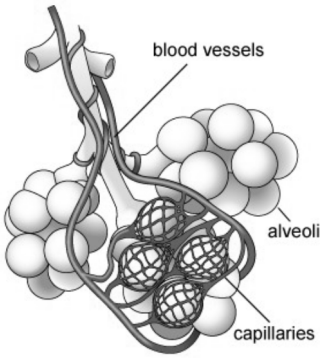
Materials Exchange from Blood

The blood has the job of moving materials such as food molecules, vitamins, water, gases, and waste products through the body. Cells throughout the body exchange many substances with blood. However, some organs also move materials into and out of the blood. Diagrams 1 and 2 below show parts of the lungs and small intestine. The main function of each of these organs is to move materials into or out of the blood.

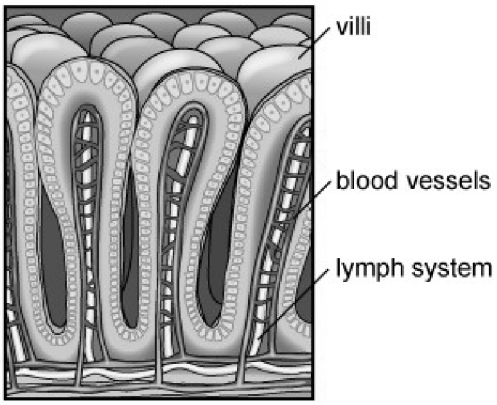
Some organs specialize in moving materials needed by the body into the blood. For example, molecules from digested food travel from the small intestine into the bloodstream. The blood then carries these food molecules throughout the body. This process enables cells in other parts of the body, like the brain, bones, muscles, and skin, to receive the nutrients they need to function.

Some organs specialize in helping the body get rid of waste products. Waste molecules are created by all cells in the body. The blood collects waste and carries it to organs that help the body get rid of the waste materials. These organs, such as the kidneys, have specialized structures that allow them to filter wastes out of the blood while keeping useful materials in. This ability to filter and remove wastes is important for all life.

1. Alveoli in Lungs



2. Villi in Small Intestine



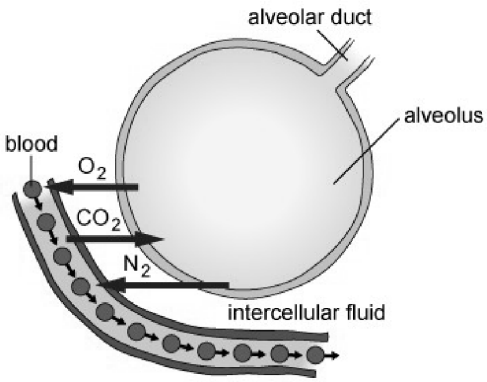
197. The table shows the percent of important gases in inhaled air and exhaled air.

Gases in Inhaled and Exhaled Air

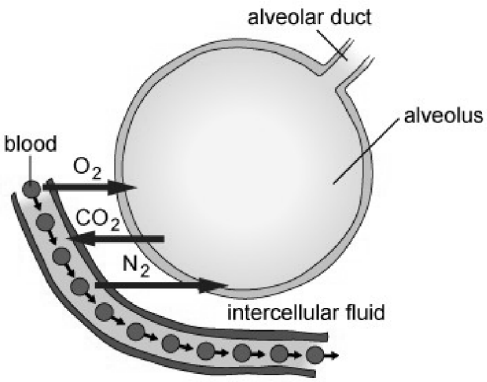
Gas	Inhaled Air	Exhaled Air
Nitrogen (N_2)	79%	79%
Oxygen (O_2)	21%	16%
Carbon Dioxide (CO_2)	0.04%	4%

Which model shows how gases are exchanged in the alveoli in the lungs?

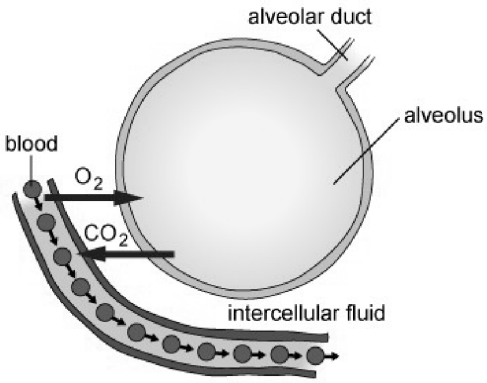
A.



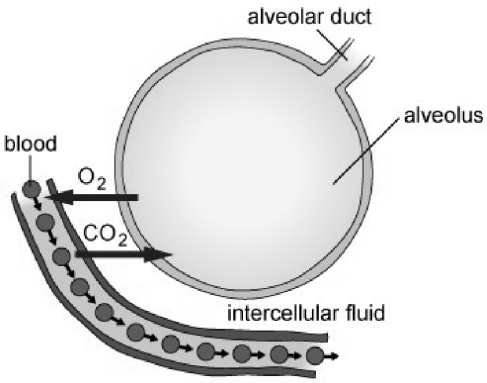
B.



C.



D.

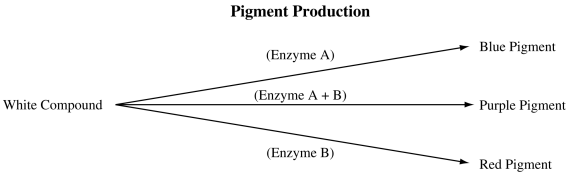


198. In the process of photosynthesis, green plants use energy from sunlight to make which product?

A. carbon dioxide B. chlorophyll

C. sugar D. DNA

199. The diagram below shows a biochemical pathway.



In one species of plant, the flower petals are normally purple if both enzyme A and enzyme B are produced. If a mutation occurred that stopped production of enzyme A, but *not* enzyme B, what color flower petals would be produced?

A. red B. blue C. white D. purple

200. A mutation that prevents a maple tree from efficiently taking gases from the air would *most directly* affect which of the following processes?

A. reproduction B. photosynthesis

C. water uptake D. DNA replication

Biology Standard 1 (All elements) 4/24/2023

1.
Answer: C
Points: 1

2.
Answer: C
Points: 1

3.
Answer: A
Points: 1

4.
Answer: C
Points: 1

5.
Answer: C
Points: 1

6.
Answer: D
Points: 1

7.
Answer: B
Points: 1

8.
Answer: B
Points: 1

9.
Answer: D
Points: 1

10.
Answer: D
Points: 1

11.
Answer:
Points: 1

12.
Answer: A
Points: 1

13.
Answer: D
Points: 1

14.
Answer: C
Points: 1

15.
Answer: C
Points: 1

16.
Answer: B
Points: 1

17.
Answer: B
Objective: LA LS-M-A2
Points: 1

18.
Answer: B
Objective: LA LS-H-E2
Points: 1

19.
Answer: C
Objective: LA LS-M-A1
Points: 1

20.
Answer: D
Objective: MA 4
Points: 1

21.
Answer: A
Objective: MA 4
Points: 1

22.
Answer: A
Objective: MA 5
Points: 1

23.
Answer: A
Objective: MA 2.5
Points: 1

24.
Answer: A
Objective: MA 2.5
Points: 1

25.
Answer: B
Objective: MA 2.1
Points: 1

26.
Answer: C
Objective: MA 2.1
Points: 1

27.
Answer: C
Objective: MA 2.1
Points: 1

28.
Answer: C
Objective: MA 2.1
Points: 1

29.
Answer: C
Objective: MA 2.1
Points: 1

30.
Answer: D
Objective: MA 2.2
Points: 1

31.
Answer: C
Objective: MA 2.1
Points: 1

32.
Answer: B
Objective: MA 2.1
Points: 1

33.
Answer: C
Objective: MA 5.3
Points: 1

34.
Answer: D
Objective: MA 2.2
Points: 1

35.
Answer: A
Objective: MA 2
Points: 1

36.
Answer: D
Objective: MA 2.2
Points: 1

37.
Answer: D
Objective: MA 2.2
Points: 1

38.
Answer: B
Objective: MA 2.2
Points: 1

39.
Answer: A
Objective: MA 2.2
Points: 1

40.
Answer: D
Objective: MA 2.2
Points: 1

41.
Answer: A
Objective: MA 2.1
Points: 1

42.
Answer: B
Points: 1

43.
Answer: C
Points: 1

44.
Answer: A
Points: 1

45.
Answer: A
Points: 1

46.
Answer: D
Points: 1

47.
Answer: A
Points: 1

48.
Answer: D
Points: 1

49.
Answer: A
Points: 1

50.
Answer: B
Points: 1

51.
Answer: D
Points: 1

52.
Answer: C
Points: 1

53.
Answer: A
Points: 1

54.
Answer: A
Points: 1

55.
Answer: A
Points: 1

56.
Answer: C
Points: 1

57.
Answer: B
Points: 1

58.
Answer: B
Points: 1

59.
Answer: A
Points: 1

60.
Answer: B
Points: 1

61.
Answer: B
Points: 1

62.
Answer: A
Points: 1

63.
Answer: A
Points: 1

64.
Answer: D
Points: 1

65.
Answer: C
Points: 1

66.
Answer: B
Objective: MS 71a
Points: 1

67.
Answer: B
Objective: MS 71a
Points: 1

68.
Answer: D
Objective: MS 71a
Points: 1

69.
Answer: D
Objective: MS 3b2
Points: 1

70.
Answer: C
Objective: MS 3b2
Points: 1

71.
Answer: B
Objective: MS 3g3
Points: 1

72.
Answer: A
Objective: MS B03e
Points: 1

73.
Answer: C
Objective: MS B03e
Points: 1

74.
Answer: B
Objective: MS B03c
Points: 1

75.
Answer: D
Objective: MS B03c
Points: 1

76.
Answer: A
Objective: MS B03c
Points: 1

77.
Answer: B
Objective: MS B03a
Points: 1

78.
Answer: A
Objective: MS B03e
Points: 1

79.
Answer: A
Objective: MS B03c
Points: 1

80.
Answer: B
Objective: MS B03c
Points: 1

81.
Answer: C
Objective: MS B03c
Points: 1

82.
Answer: A
Objective: MS B03c
Points: 1

83.
Answer: B
Points: 1

84.
Answer: C
Points: 1

85.
Answer: C
Points: 1

86.
Answer: B
Points: 1

87.
Answer: B
Points: 1

88.
Answer: B
Points: 1

89.
Answer: A
Points: 1

90.
Answer: D
Points: 1

91.
Answer: D
Points: 1

92.
Answer: A
Points: 1

93.
Answer: C
Points: 1

94.
Answer: B
Points: 1

95.
Answer: C
Points: 1

96.
Answer:
Points: 1

97.
Answer: B
Points: 1

98.
Answer: C
Points: 1

99.
Answer: A
Points: 1

100.
Answer: D
Points: 1

101.
Answer: A
Points: 1

102.
Answer: A
Points: 1

103.
Answer: D
Points: 1

104.
Answer: D
Points: 1

105.
Answer: D
Points: 1

106.
Answer: A
Points: 1

107.
Answer: B
Points: 1

108.
Answer: C
Points: 1

109.
Answer: A
Points: 1

110.
Answer: C
Points: 1

111.
Answer: A
Points: 1

112.
Answer: A
Points: 1

113.
Answer: A
Objective: LA LS-M-A5
Points: 1

114.
Answer: A
Objective: MA 1.3
Points: 1

115.
Answer: C
Objective: MA 1.2
Points: 1

116.
Answer: B
Objective: MA 1.1
Points: 1

117.
Answer: C
Objective: MA 1.2
Points: 1

118.
Answer: B
Objective: MA 1.3
Points: 1

119.
Answer: A
Objective: MA 1.1
Points: 1

120.
Answer: A
Objective: MA 1.3
Points: 1

121.
Answer: B
Objective: MA 1.2
Points: 1

122.
Answer: A
Objective: MA 1.1
Points: 1

123.
Answer: B
Objective: MA 1.2
Points: 1

124.
Answer: D
Objective: MA 1.2
Points: 1

125.
Answer: A
Objective: MA 2.5
Points: 1

126.
Answer: D
Objective: MA 1.2
Points: 1

127.
Answer: C
Objective: MA 1.3
Points: 1

128.
Answer: D
Objective: MA 5.2
Points: 1

129.
Answer: A
Objective: MA 1.2
Points: 1

130.
Answer: B
Objective: MA 5.1
Points: 1

131.
Answer: B
Objective: MA 1.3
Points: 1

132.
Answer: A
Objective: MA 1.2
Points: 1

133.
Answer: B
Objective: MA 1.3
Points: 1

134.
Answer: C
Objective: MA 1.2
Points: 1

135.
Answer: B
Objective: MA 3.1
Points: 1

136.
Answer: B
Objective: MA 3.1
Points: 1

137.
Answer: A
Objective: MA 1.2
Points: 1

138.
Answer: A
Objective: MA 1.3
Points: 1

139.
Answer: C
Objective: MA 1.2
Points: 1

140.
Answer: D
Objective: MA 3.1
Points: 1

141.
Answer: A
Points: 1

142.
Answer: C
Points: 1

143.
Answer: C
Points: 1

144.
Answer: C
Points: 1

145.
Answer: C
Points: 1

146.
Answer: D
Points: 1

147.
Answer: B
Points: 1

148.
Answer: C
Points: 1

149.
Answer: A
Points: 1

150.
Answer: C
Points: 1

151.
Answer: A
Objective: MS 82d
Points: 1

152.
Answer: D
Objective: MS 72a
Points: 1

153.
Answer: B
Objective: MS B02e
Points: 1

154.
Answer: A
Objective: MS B02e
Points: 1

155.
Answer: A
Objective: MS B02e
Points: 1

156.
Answer: C
Objective: MS B02e
Points: 1

157.
Answer: B
Objective: MS B04a
Points: 1

158.
Answer: D
Objective: MS B02e
Points: 1

159.
Answer: B
Objective: MS B02e
Points: 1

160.
Answer: D
Objective: MS B02f
Points: 1

161.
Answer: A
Objective: MS B02e
Points: 1

162.
Answer: B
Objective: MS B02e
Points: 1

163.
Answer: B
Objective: MS B02e
Points: 1

164.
Answer: A
Objective: MS B02f
Points: 1

165.
Answer: B
Objective: MS B02e
Points: 1

166.
Answer: A
Points: 1

167.
Answer: C
Points: 1

168.
Answer: C
Points: 1

169.
Answer: A
Points: 1

170.
Answer: A
Points: 1

171.
Answer: A
Points: 1

172.
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Points: 1

173.
Answer: C
Points: 1

174.
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Points: 1

175.
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Points: 1

176.
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Points: 1

177.
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Points: 1

178.
Answer: C
Points: 1

179.
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Points: 1

180.
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Points: 1

181.
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Points: 1

182.
Answer:
Points: 1

183.
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Points: 1

184.
Answer:
Points: 1

185.
Answer:
Points: 1

186.
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Points: 1

187.
Answer: A
Points: 1

188.
Answer: C
Points: 1

189.
Answer: A
Points: 1

190.
Answer: C
Points: 1

191.
Answer: A
Objective: LA LS-M-A2
Points: 1

192.
Answer: D
Objective: LA SE-M-A7
Points: 1

193.
Answer: A
Objective: LA ESS-H-C4
Points: 1

194.
Answer: D
Objective: LA LS-M-A4
Points: 1

195.
Answer: B
Objective: LA SE-M-A7
Points: 1

196.
Answer: C
Objective: LA SE-M-A7
Points: 1

197.
Answer: D
Points: 1

198.
Answer: C
Objective: MA 16
Points: 1

199.
Answer: A
Objective: MA 1.5
Points: 1

200.
Answer: B
Objective: MA 2.6
Points: 1