

**TEST NAME: Test 1: Lessons 1-4 (Regular)**  
**TEST ID: 3210916**  
**GRADE: 10 - Tenth Grade**  
**SUBJECT: Life and Physical Sciences**  
**TEST CATEGORY: School Assessment**

09/05/19, Test 1: Lessons 1-4 (Regular)

Student: \_\_\_\_\_

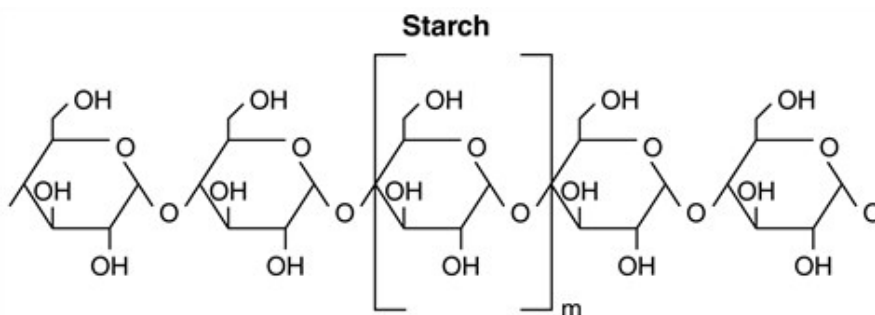
Class: \_\_\_\_\_

Date: \_\_\_\_\_

1. Which biomolecule contains the element nitrogen?

- A. protein
- B. polysaccharide
- C. lipid
- D. monosaccharide

2. 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

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

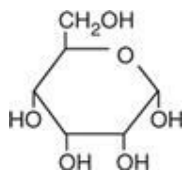
- A. triglycerides
- B. amino acids
- C. monosaccharides
- D. nucleotides

4. The R group, or side chain, of the amino acid glutamic acid is hydrophilic. The R group of the amino acid valine is hydrophobic. Where would a researcher expect to find these amino acids in the three-dimensional structure of a protein?

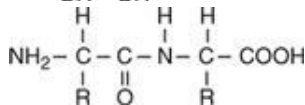
- A. Glutamic acid would be in the interior, and valine would be on the exterior of the protein.
- B. Valine would be in the interior, and glutamic acid would be on the exterior of the protein.
- C. Both glutamic acid and valine would be in the interior of the protein.
- D. Both glutamic acid and valine would be in the exterior of the protein.

5. Which of the following are the building blocks of lipids?

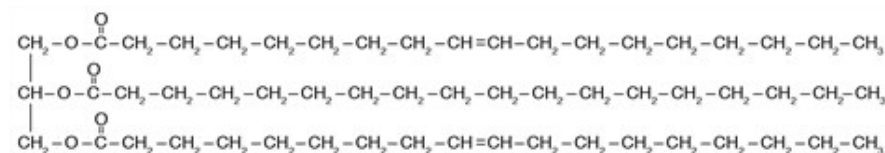
A.



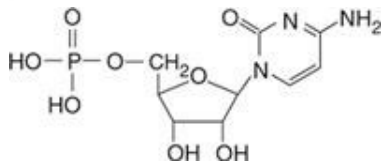
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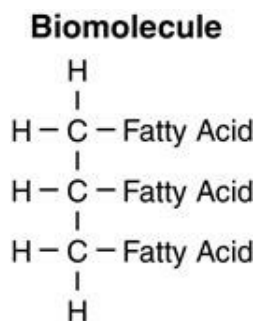
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D.



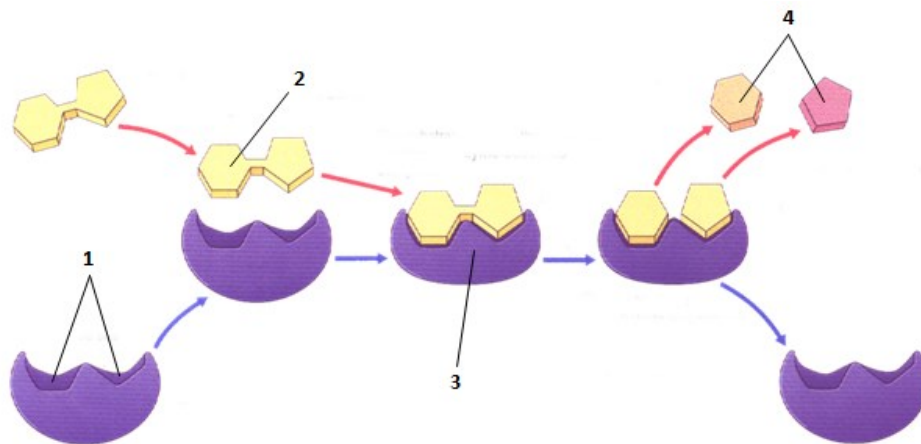
6. The diagram shows the basic structure of a biomolecule.



If a scientist analyzed a food sample and identified this molecule, which food was she ***MOST*** likely studying?

- A. butter
- B. potatoes
- C. lean chicken
- D. lettuce

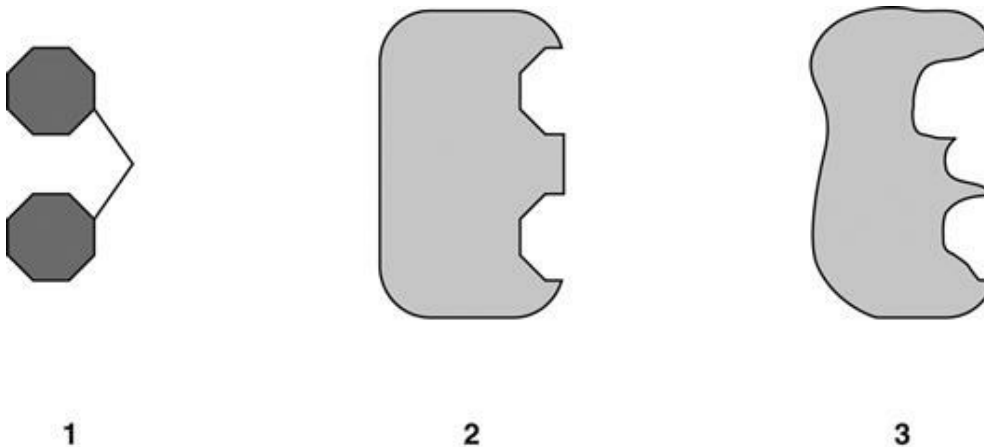
7. Which type of molecules combine to make up the protein portion of hemoglobin?
- fatty acids
  - amino acids
  - monosaccharides
  - nucleotides
8. Which of these contains carbon, hydrogen, and oxygen in a 1:2:1 ratio?
- proteins
  - lipids
  - carbohydrates
  - steroids
9. A biological molecule is analyzed, and it is discovered that the molecule is composed of several amino acids. Which of these identifies the biological molecule?
- It is a lipid.
  - It is a protein.
  - It is DNA.
  - It is a polysaccharide.
10. Enzymes act as catalysts in biochemical reactions.



In the diagram, which represents the substrate?

- 1
- 2
- 3
- 4

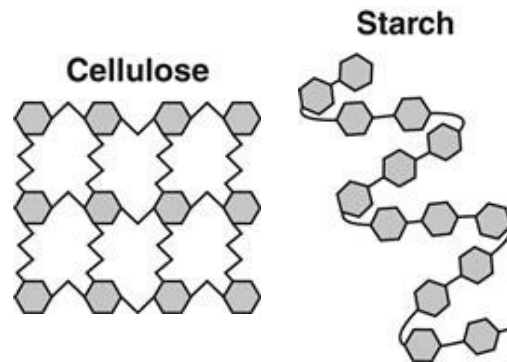
11. **Amylase is a chemical that decomposes starch into maltose and dextrin. Which BEST describes the role of amylase in the human body?**
- A. as an inhibitor of insulin production
  - B. as an enzyme that aids in digestion
  - C. as a catalyst for protein synthesis
  - D. as a receptor of fatty acid chains
12. **Which type of substances serves as a catalyst for reactions that break large food molecules into smaller useful molecules?**
- A. enzymes
  - B. vitamins
  - C. lipids
  - D. nucleotides
13. **Illustration 1 shows sugar that has formed a bond by the action of an enzyme. Illustration 2 shows the enzyme, and Illustration 3 shows the enzyme after the addition of heat.**



**How does the addition of heat affect the ability of an enzyme to help the sugar molecules form a bond?**

- A. Heat allows the sugar molecules to bond more quickly.
- B. Heat provides places on the enzyme for other molecules to bond.
- C. Heat changes the enzyme so that the sugar molecules can no longer bond.
- D. Heat changes the chemical composition of the sugar molecules so they no longer need the enzyme.

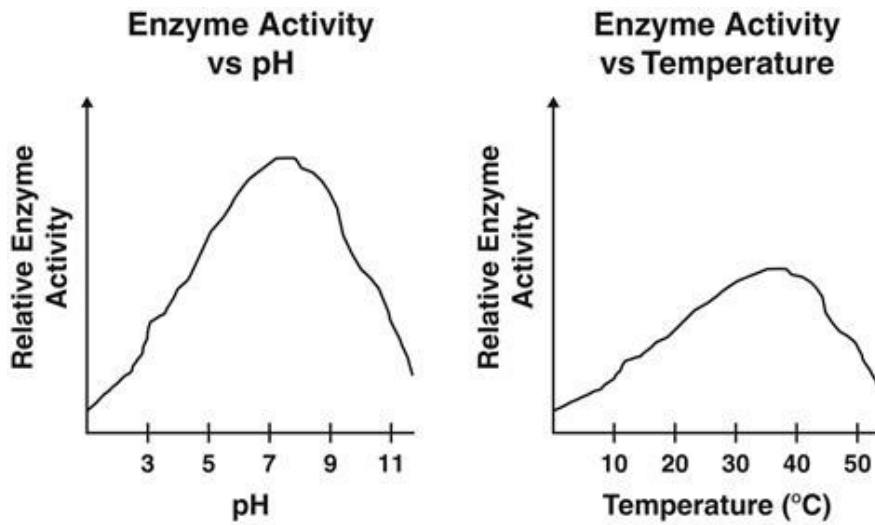
14. The diagram shows two large molecules made by plants.



Which answer choice accurately describes these molecules?

- A. They both contain a polypeptide chain.
  - B. They are both easily digested by human enzymes.
  - C. They are both polysaccharides.
  - D. Both can pass through the cell membrane by simple diffusion.
15. Salivary amylase is an enzyme in the human body that digests carbohydrates from food. When food mixed with saliva enters the stomach, the action of salivary amylase slows dramatically. Which most likely causes salivary amylase enzyme to stop digesting food?
- A. The pH of the stomach is lower than in the mouth.
  - B. The concentration of food decreases in the stomach.
  - C. The temperature of the food increases in the stomach.
  - D. The food is mixed more in the mouth than in the stomach.

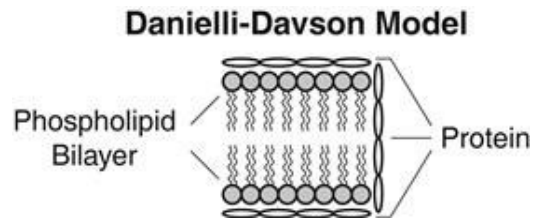
16. Catalase is an enzyme that speeds up the decomposition of hydrogen peroxide ( $\text{H}_2\text{O}_2$ ) into water and oxygen. Students conducted two investigations to determine the ideal conditions for the function of catalase. One investigation compared catalase activity at different values of pH. The other investigation compared catalase activity at different temperatures.



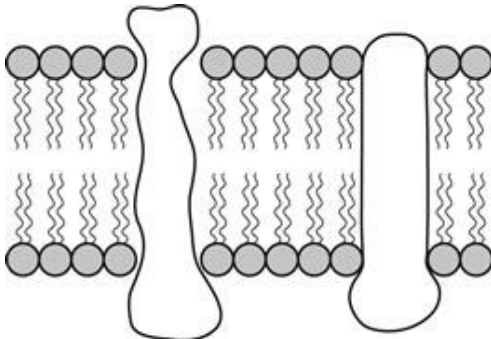
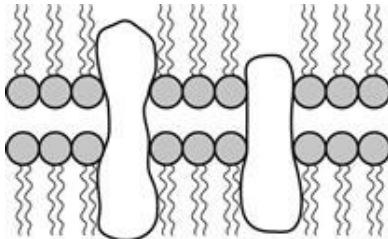
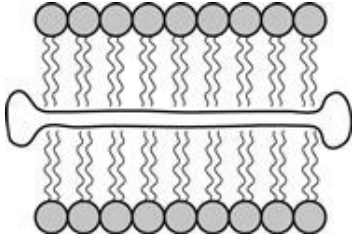
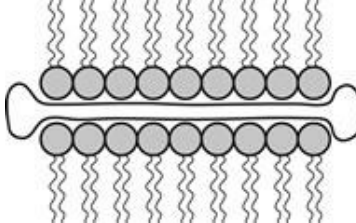
According to the data in the graphs, which pH and temperature combination provides the BEST conditions for catalase to function?

- A. pH 5 and 4°C
  - B. pH 5 and 25°C
  - C. pH 7 and 37°C
  - D. pH 7 and 50°C
17. The concentration of sodium ( $\text{Na}^+$ ) and potassium ( $\text{K}^+$ ) 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 on the sodium-potassium pump, which uses which kind of transport?
- A. osmosis
  - B. simple diffusion
  - C. active transport
  - D. facilitated diffusion

18. In 1940, Danielli and Davson proposed that the cell membrane was a bilayer of phospholipids. These phospholipids were sandwiched between two continuous layers of proteins as shown.

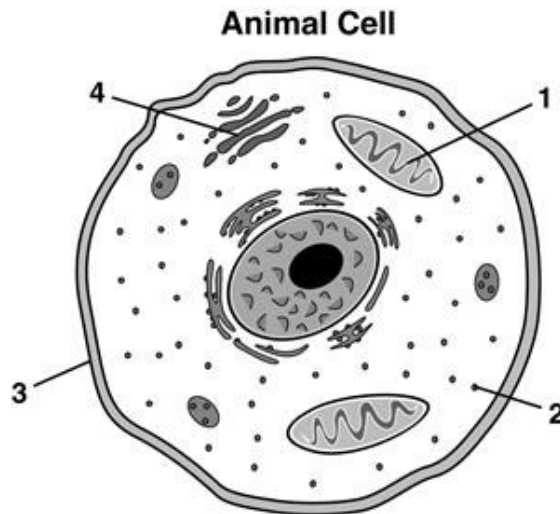


Later, electron micrographs revealed globular irregular proteins embedded in the bilayer of the phospholipids. Unlike the Danielli-Davson proposal, the proteins were scattered throughout the outer surfaces. Which of the following BEST modifies the Danielli-Davson model of the cell membrane?

- A. 
- B. 
- C. 
- D. 

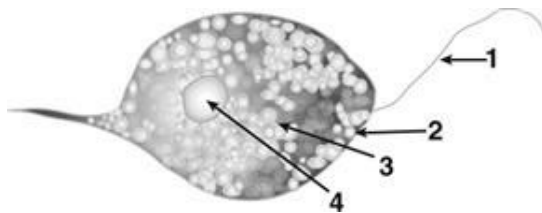


19. A diagram of a cell is shown below.



**In which structure is ATP produced?**

- A. 1
  - B. 2
  - C. 3
  - D. 4
20. **Proteins that are synthesized in ribosomal subunits undergo extensive modification and are packaged and directed to the appropriate destination. Which organelle is involved in this?**
- A. endoplasmic reticulum
  - B. lysosomes
  - C. mitochondria
  - D. Golgi apparatus
21. **Look at the diagram below of the protist *Phacus*.**



**Which structure represents the flagella?**

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

22. **Which organ system performs the same job for a multicellular organism as a lysosome performs for a cell?**
- A. digestive system
  - B. excretory system
  - C. respiratory system
  - D. circulatory system
23. **Which cellular structure controls what may enter and leave a cell?**
- A. chloroplast
  - B. mitochondrion
  - C. plasma membrane
  - D. endoplasmic reticulum
24. **All living things are made up of prokaryotic or eukaryotic cells. Which structure is found in both prokaryotic and eukaryotic cells?**
- A. nuclei
  - B. chloroplasts
  - C. ribosomes
  - D. mitochondria
25. **A student identifies the following parts of a cell.**
- 1. cell wall
  - 2. RNA
  - 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
26. **Organisms contain DNA. What makes prokaryotic DNA different from eukaryotic DNA?**
- A. Prokaryotes have a circular chromosome.
  - B. Prokaryotes have linear chromosomes.
  - C. The DNA in prokaryotes is packaged in the nucleus.
  - D. Prokaryotic DNA is composed of nucleotides.

27. **Which example is a function of the selectively permeable membrane of a cell?**

- A. providing a rigid structure for the cell
- B. manufacturing proteins for the cell
- C. limiting chemicals that diffuse out of the cell
- D. storing waste products for the cell

28. **How does sweating most help to maintain homeostasis?**

- A. the removal of excess heat from the body
- B. the removal of carbon dioxide from the body
- C. the removal of excess oxygen from the blood
- D. the removal of nitrogenous wastes from the blood

29. **Cell membranes are described as selectively permeable. Four students were asked to explain what this means and provided the answers given below.**

**Student 1:** *Cell membranes prevent all materials from entering the cell.*

**Student 2:** *Cell membranes only provide structural support for the cell.*

**Student 3:** *Cell membranes regulate which substances can enter and exit the cell.*

**Student 4:** *Cell membranes allow water and water-soluble substances to enter the cell.*

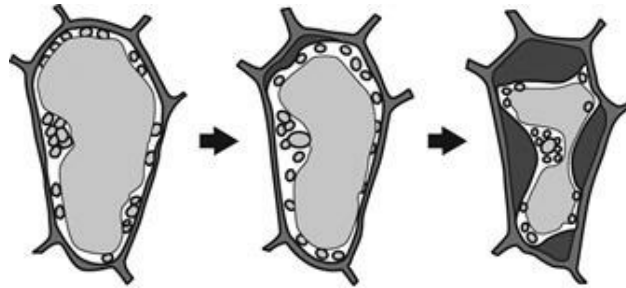
**Which student correctly identified the function of the selectively permeable membrane?**

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

30. **A plant cell that is low in water will MOST likely immediately lose the ability to**

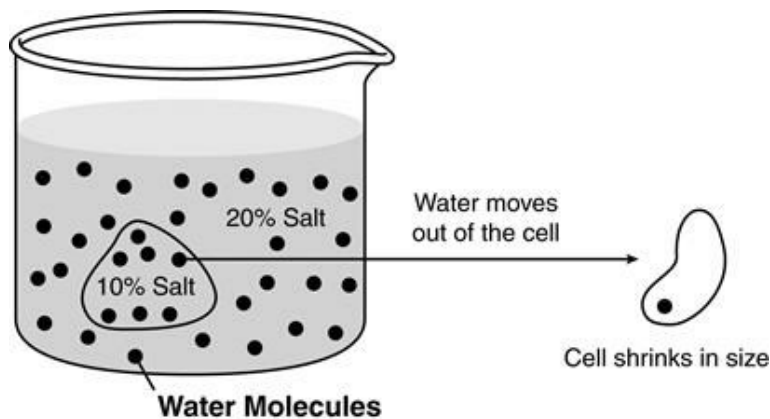
- A. remain rigid.
- B. absorb sunlight.
- C. release oxygen.
- D. reproduce again.

31. 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?

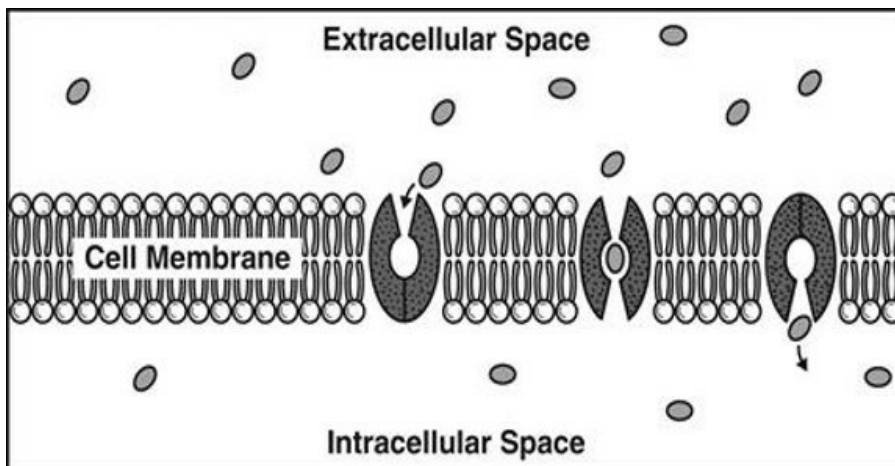
- A. The cell was submerged in a pure solution.
  - B. The cell was submerged in a hypotonic solution.
  - C. The cell was submerged in an isotonic solution.
  - D. The cell was submerged in a hypertonic solution.
32. A cell with a 10% salt concentration is placed into a beaker that contains a 20% salt concentration. The cell shrinks, as shown in the diagram below.



Which term best describes the solution the cell is in?

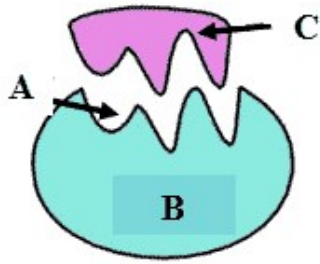
- A. hypotonic
- B. hypertonic
- C. isotonic
- D. dilute

33. Which component of the cell membrane functions to actively transport molecules into the cell?
- A. carbohydrate
  - B. cytoplasm
  - C. phospholipid
  - D. protein
34. When the air temperature is 100°F (38°C) and a mist of water droplets is sprayed on a person, the moisture quickly disappears. The result is a cooling effect on the person, even if the liquid water droplets are the same temperature as the surrounding air. How can this cooling sensation be explained?
- A. The water droplets lose heat energy as they travel through the air.
  - B. The water droplets absorb heat energy from the skin to evaporate.
  - C. The particles in the liquid move faster than in the gas, causing the liquid to be cooler.
  - D. The particles in the gas are farther apart than in the liquid, causing the liquid to feel cooler.
35. Which term best describes the process being shown here?



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

36. Which letter points to the active site of the enzyme?

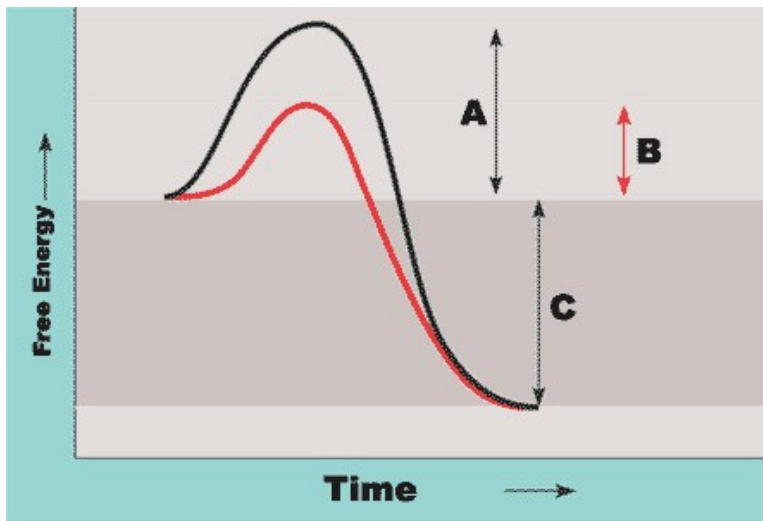


- A. A
- B. B
- C. C
- D. None of these

37. Which of the following is not a characteristic that all living things share?

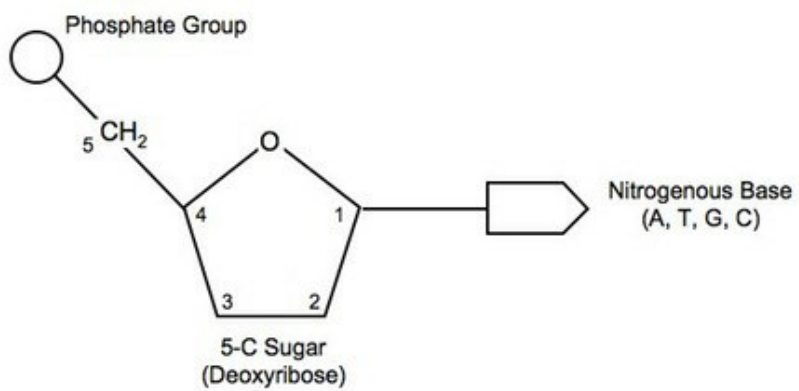
- A. All living things are composed of cells
- B. All living things reproduce
- C. All living things contain nuclei
- D. All living things maintain homeostasis

38. Which letter indicates the activation energy of a chemical reaction without a catalyst present?



- A. A
- B. B
- C. C
- D. none of these
39. Which of the following is NOT a function of lipids?
- A. long-term energy storage
- B. to act as enzymes
- C. they make up the cell membrane
- D. to act as hormones

40. This image shows which monomer?



- A. nucleotide
- B. amino acid
- C. monosaccharide
- D. triglyceride