Quiz: Carbon-Based Molecules

Read each question. Circle the letter of the correct answer.

1. ATP (adenosine triphosphate) stores energy in the bonds between its _____.

A. nucleotides

B. carbon atoms

C. hydrogen atoms

D. phosphate groups

2. What type of carbon-based molecule is the first to be broken down by the body's cells to provide a source of energy?

A. fat

B. protein

C. amino acid

D. carbohydrate

3. The smallest particle of matter that can retain the chemical properties of carbon is a carbon _____.

A. atom

B. element

C. molecule

D. macromolecule

4. Which of these is a central purpose of steroids in mammals?

A. They form protective coatings.

B. They serve as chemical messengers.

C. They provide most of the energy for a cell.

D. They break down bonds in polymers by adding water.

5. When fatty acids cannot pack together tightly enough to make a solid fat, they have _____.

A. very little glycerol

B. more polar molecules

C. fewer hydrogen atoms

D. no double carbon bonds

6. Which bonds could a single carbon atom have?

A. 2 triple bonds

B. 5 single bonds

C. a triple bond and a single bond

D. a triple bond and a double bond

7. Which of these describes a polymer?

A. large molecule made of smaller subunits

B. molecule with a polar head and nonpolar tails

C. a molecule composed of hydrogen, carbon, and oxygen

D. a molecule that catalyzes a reaction in living organisms

8. Which of these describes the structure of a nucleic acid?

A. a long chain of monosaccharides

B. several fatty acids linked together

C. a hydrophilic head containing a glycerol and two hydrophobic tails

D. a chain of monomers composed of a sugar, a phosphate group, and a nitrogenous base

9. Which of these describes the primary structure of a protein?

A. the three-dimensional shape of the protein

B. the sequence of the amino acids in the protein

C. the arrangement of multiple polypeptide chains

D. the folding of the protein into sheets and spirals

10. What is the role of cholesterol in the cell membrane?

A. It causes osmosis to occur across the membrane.

B. It forms a rigid structure that maintains cell shape.

C. It prevents the membrane from being solid or too fluid.

D. It prevents substances from entering or leaving the cell.

Read each statement. Write your answer on the lines.

11. Explain why photosynthesis is important to living organisms. Enter your answer in the space provided.

12. In an ecosystem, what form does carbon take after photosynthesis? What form does carbon take after cellular respiration?

13. All living things are made of carbon-based molecules. These molecules have different structures and functions. Explain how the atomic structure and covalent bonding properties of carbon atoms allow carbon to form many different types of molecules with many different functions. In your answer:

Define covalent bond.

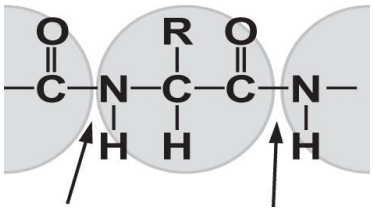
Explain how carbon-based rings and chains can form very large molecules.

Name the four main types of carbon-based molecules in organisms and describe one function of one type.

Directions: Read the passage, then answer the questions that follow.

Carbon Bonding

The figure shows carbon atoms forming bonds with a variety of other atoms. The number and types of bonds an atom can form can provide information about the structure of the atom.



14. What do the four lines that surround the *C* illustrate about carbon?

15. Explain whether the central carbon atom in the diagram form more bonds than those that are shown? Why or why not?