# **Chemistry of Living Things Comprehension Check**

For questions 1-4, match each vocabulary term to the correct definition:

|  |  |
| --- | --- |
| 1. Amino Acids | a. sugars that store energy in living cells |
| 2. Carbohydrates | b. the instructions that tell cells when and how to make the proteins they need to survive and grow |
| 3. Lipids | c. any one of a group of compounds of nitrogen, hydrogen, carbon, and oxygen that combine in various ways to form the proteins that make up living matter |
| 4. Nucleic Acids | d. a large group of oily, fatty, or waxy substances that do a variety of jobs including sharing signals among cells, storing energy in cells, and separating cells from their environments |

1. Amino Acids –
2. Carbohydrates –
3. Lipids –
4. Nucleic Acids –
5. What are chemists describing when they talk about functional groups in biomolecules?
6. Compare the two kinds of nucleic acids.
7. How do phospholipids form lipid bilayers, and what role do they play in living things?
8. Describe how enzymes work in cells to speed up the chemical reactions they need to function, repair themselves, and reproduce.
9. Sometimes chemical reactions occur automatically in cells, whereas other times they require energy. Where do cells get the energy they need to function and survive?
10. Describe the role of chloroplasts in photosynthesis. (Photosynthesis,, p. 36)

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1. Amino Acids – c
2. Carbohydrates – a
3. Lipids – d
4. Nucleic Acids – b
5. What are chemists describing when they talk about functional groups in biomolecules?
   1. When chemists discuss functional groups in biomolecules, they are really talking about four groups used to classify biomolecules by their properties. Functional groups bond with other atoms to make the four main types of biomolecules: nucleic acids, carbohydrates, lipids, and proteins.
6. Compare the two kinds of nucleic acids.
   1. There are two types of nucleic acids: DNA (deoxyribonucleic acid) and RNA (ribonucleic acid). DNA is a chainlike molecule found in every living cell. It directs the formation, growth, and reproduction of cells and organisms. DNA includes two chains that twist in a ladder to form a double helix. It holds thousands of sections called genes, which are the units of code that determine every trait passed on to a living thing by its parents.
   2. RNA is a complex molecule that comes in in single-sided chains. Unlike DNA, RNA is able to leave the nucleus of a cell and carry instructions from DNA to the rest of the cell.
7. How do phospholipids form lipid bilayers, and what role do they play in living things?
   1. Lipids are a large group of oily, fatty, or waxy substances. Phospholipids have a phosphate functional group at one end and two fatty acid chains on the other. Phosphates are attracted to water, whereas fatty acids repel it. This allows the lipids to automatically arrange themselves into a lipid bilayer, which can act as a wall in living cells. Lipid bilayers form cell membranes and keep unwanted substances outside of the cells.
8. Describe how enzymes work in cells to speed up the chemical reactions they need to function, repair themselves, and reproduce.
   1. Enzymes are a family of biomolecules that speed up chemical reactions in all living things. Enzymes have unique shapes that allow them to attach to certain molecules, their reactants. They combine with the reactants and split them to create products. The enzyme then repeats this process inside the living cell.
9. Sometimes chemical reactions occur automatically in cells, whereas other times they require energy. Where do cells get the energy they need to function and survive?
   1. Cells store their energy in special molecules called adenosine triphosphates, or ATP. ATP acts like a battery that can be recharged and used again for cellular functions. All living cells use cellular respiration to combine food molecules with oxygen molecules to produce energy. In addition, plants use chloroplasts to convert light energy from the sun into sugars that can then undergo cellular respiration, producing energy for the cell.
10. Describe the role of chloroplasts in photosynthesis. (Photosynthesis, p. 36)
    1. Chloroplasts are organelles found in plant cells that use light energy to combine carbon dioxide with water molecules to create sugars. The plant uses some sugars to build its tissues but breaks most of them down via cellular respiration to make energy.