

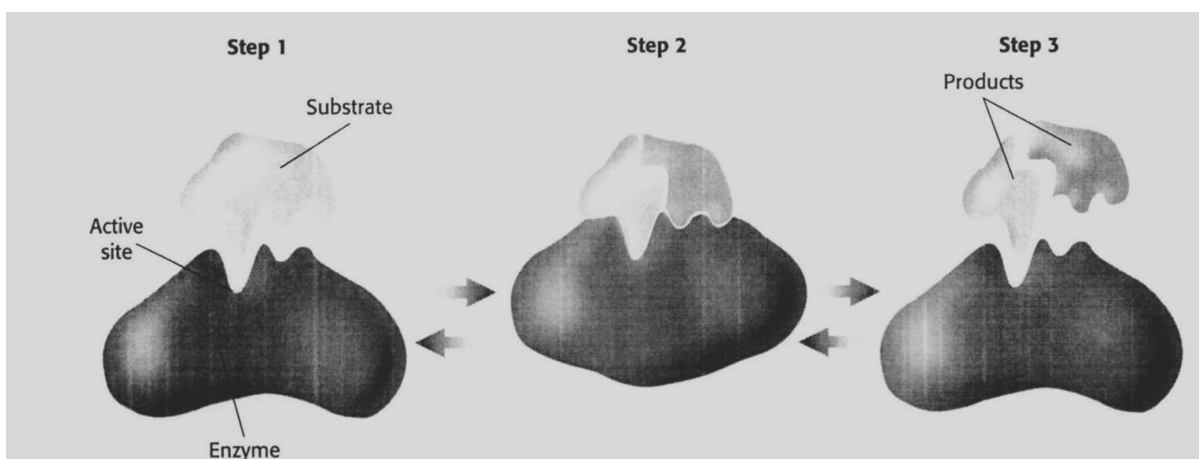
Biochemistry, Water and Characteristics of Life STUDY GUIDE

Answer the following questions.

1. Organic molecules are composed of **CARBON** atoms.
2. Most organic molecules are made of smaller units called **MONOMERS**.
3. Many monomers bond together to form larger molecules (macromolecules) called **POLYMERS**
4. **ENERGY** is stored in bonds that link monomers together.
5. Each organic molecule has a different amount of **CALORIC** value for use by organisms.
6. The energy **STORED** in organic molecule **BONDS** determine its **CALORIC** value.
7. The **STRUCTURE** of proteins allows them to have many different functions.
8. **AMINO ACIDS** are carried by the bloodstream and enter the cell when proteins break down.
9. Once inside the cell, amino acids are used as **RAW MATERIALS** to make **PROTEINS** needed by the organism.
10. **ENZYMES** are special proteins that accelerate chemical reactions.
11. Enzymes are also called biological **CATALYSTS**.
12. **CARBOHYDRATES** are a primary source of fuel for cellular respiration.
13. The carbon, hydrogen, and oxygen atoms of carbohydrates serve as the raw materials for making other types of small organic molecules such as amino acids and **FATTY** acids.
14. When carbohydrates are scarce, an organism uses **LIPIDS** as an energy source.
15. Fats provide **LONG TERM** energy storage, cushioning of vital organs and **INSULATION** of the body
16. Lipids are a major component of **CELL MEMBRANE** and are needed to make vitamins and **HORMONES**.
17. **CARBOHYDRATES, PROTEINS, and LIPIDS** are organic compounds that have important functions in the human body.
18. The energy needed for a chemical reaction to occur is called **ACTIVATION** energy.
19. Changes in **TEMPERATURE** or **pH** can affect a chemical reaction.
20. The **pH**, which measures the acidity of a solution, must be kept in a narrow range.
21. **BUFFERS** are chemicals in organisms that regulate the pH.
22. pH needs to be regulated so that **HOMEOSTASIS** can be maintained.
23. A **CATALYST** is a substance that changes the rate of a chemical reaction.
24. Catalysts work by **LOWERING** the activation energy needed for a reaction to occur.
25. A catalyst is **NOT USED UP** or changed during a reaction so it can be used over again.
26. Enzymes are **PROTEINS** which serve as catalysts in living organisms.
27. Enzymes are very **SPECIFIC** as they can catalyze **ONLY ONE TYPE** of chemical reaction.
28. Enzymes work on one particular **SUBSTRATE** or reactant.
29. Enzymes are involved in many of the chemical reactions necessary for organisms to live, **REPRODUCE, GROW, DIGEST, RESPIRE, MOVE** and regulate cells.
30. The structure of enzymes can be altered by **TEMPERATURE** and pH.

31. Each catalyst works best at a specific **TEMPERATURE** and **pH**.
32. *Chemical* reactions allow organisms to grow develop, reproduce and **ADAPT**.
33. A chemical reaction **BREAKS DOWN** some substances and **FORMS** other substances.
34. **INDICATORS** are chemical compounds that change color in the presence of other substances.
35. **HYDROLYSIS** is how polymers are broken down into their monomers.
36. Monomers form polymers through **CONDENSATION** reaction, also called **DEHYDRATION SYNTHESIS**.
37. The presence of sugar can be detected with **BENEDICTS** solution but must be **BOILED**.
38. The presence of lipids can be detected using **SUDAN**.
39. Protein is found by using **BIURETS**.
40. Starch can be found by using **IODINE**.
41. The ability of water to stick to itself is called **COHESION**.
42. Since water has both a slightly positive end (H) and a slightly negative end (O), it is considered to be a **POLAR** molecule.
43. Lipids are **NON POLAR** since they DO NOT have oppositely charged ends.
44. Lipids are **INSOLUABLE** in water.
45. The ability of water to stick to OTHER things is called **ADHESION**.
46. **NUCLEOTIDES** contain a sugar, phosphate molecule and a nitrogen-containing base.
47. **DNA**, found in the nucleus of a cell, is considered the “code of life” and carries genetic information.
48. The function of RNA is to manufacture **PROTEINS**.
49. Name the 8 characteristics of living things. **GROW AND DEVELOP, REPRODUCE, RESPOND TO STIMULI, ENERGY USE, EVOLVE AND ADAPT, HOMEOSTASIS, ORGANIZATION, DNA**

50. Draw and label the Enzyme-Substrate Complex (E-S complex). EXPLAIN WHAT OCCURS!!



51. Identify the 3 types of carbohydrates and give examples of each (mono, di, polysaccharide). See ½ blue sheet and the “cut and paste” activity we did.

MONOSACCHARIDE

GLUCOSE
FRUCTOSE
C₆H₁₂O₆

DISACCHARIDE

SUCROSE
C₁₂H₂₂O₁₁

POLYSACCHARIDE

CELLULOSE
GLYCOGEN
STARCH

51. Be able to check the correct column for each characteristic being described. (biological compound check list)

52. Know your VOCABULARY