

Unit 1 Study Guide: Processes of Life and Biochemistry

Objective 1: Characteristics and Processes of Living Things

1. How can somebody determine if something is biotic (living) or abiotic (nonliving)?
2. For STERNGR, list the word each letter stands for, explain the word, and give an example for the word.
3. Explain the word homeostasis. Give an example of how an organism maintains homeostasis.
4. What is the difference between aerobic and anaerobic respiration?
5. What is the difference between autotrophic and heterotrophic nutrition?
6. What is the difference between sexual and asexual reproduction?

Objective 2: Organic Compounds

1. For the following organic compounds give the elements, monomers, functions, and examples, and draw a picture for carbohydrates, nucleic acids, proteins, and lipids.
2. What is the ratio of C, H, O for Carbohydrates? How is this different for lipids? Which of the compounds can be identified by the presence of nitrogen?
3. What food source can each macromolecule be found in (except nucleic acids)?
4. Describe how a positive test is determined for: lipids, proteins, monosaccharides, and polysaccharides.

Objective 3: Enzymes

1. What type of macromolecule is an enzyme?
2. Explain how an enzyme and substrate work during a chemical reaction.
3. Why is an enzyme substrate complex referred to as a "Lock and Key"? How are substrates specific to a particular enzyme and how does this catalyze the reaction?
4. Draw and label an enzyme-substrate complex.
5. Identify the three properties of an enzyme.

Objective 4: pH

1. Draw and label a pH scale. What does it measure and indicate for a particular numeric value on the scale?
2. Why does pure water (distilled) have a pH value of 7? What does the term "neutral" tell you about the hydroxide and hydrogen ion concentrations? How does this relate to acidic and basic solutions?
3. Which value in the acidic range would be considered weak or strong?
4. Which value in the basic range would be considered weak or strong?
5. Identify the ions that are more concentrated in an acid.
6. Identify the ions that are more concentrated in a base.