

Active Reading

Section: Energy and Chemical Reactions

Read the passage below. Then answer the questions that follow.

During a chemical reaction, a substance on which an enzyme acts is called a **substrate**. Enzymes act only on specific substrates. For example, the enzyme amylase assists in the breakdown of starch to glucose. In this reaction, starch is amylase's substrate.

An enzyme's shape determines its activity. Typically, an enzyme is a large protein with one or more deep folds on its surface. These folds form pockets called **active sites**. An enzyme's substrate fits into an active site.

Step 1: When an enzyme first attaches to a substrate during a chemical reaction, the enzyme's shape changes slightly so that the substrate fits more tightly in the enzyme's active site.

Step 2: At an active site, an enzyme and a substrate interact in a way that reduces the activation energy of the reaction, making the substrate more likely to react.

Step 3: The reaction is complete when products have formed. The enzyme is now free to catalyze further reactions.

SKILL: READING EFFECTIVELY

Read each question and write your answer in the space provided.

1. Define the two key terms contained in this passage.

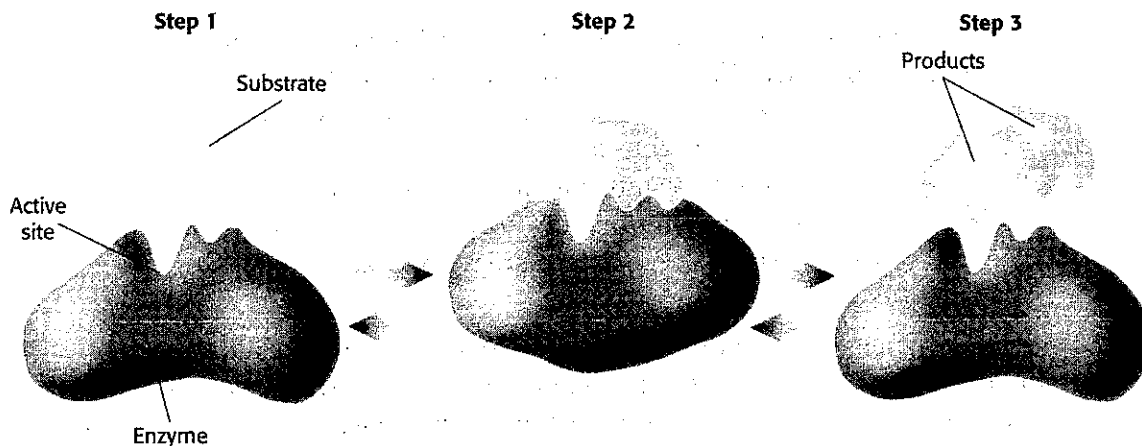
2. What substance is a substrate of amylase?

3. What determines an enzyme's activity?

Active Reading *continued*

SKILL: INTERPRETING GRAPHICS

4. The figure below shows how enzymes work. In the space provided, describe what is occurring at each step.



a. Step 1: _____

b. Step 2: _____

c. Step 3: _____

In the space provided, write the letter of the term or phrase that best answers the question.

- _____ 5. What occurs when an enzyme and a substrate interact at an active site?
- a. Activation energy is reduced.
 - b. The products are bound irreversibly.
 - c. The enzyme is changed by the reaction.
 - d. Activation energy is increased.