

Name: _____ Date: _____ Period: _____

ENZYMES

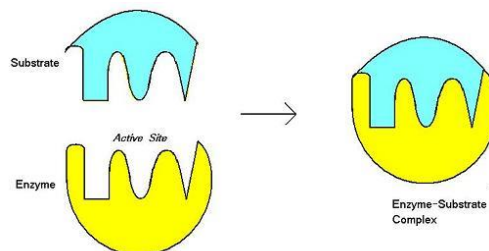
What Are Enzymes?

- ▶ Enzymes are _____
- ▶ Enzymes serve as a biological _____
 - ▶ A CATALYST starts a _____
- ▶ FUNCTIONS:
 - ▶ _____ of chemical reactions
 - ▶ Chemical reactions occur about 1 MILLION times faster with an enzyme than they would without one.
 - ▶ _____ of a chemical reaction.
 - ▶ Activation energy is the _____.

Your Turn: Why is lowering the energy we use beneficial? _____

Enzyme Specificity – ENZYMES have a very specific shape

- ▶ Each enzyme has a particular place where the substrates bind known as the _____
- ▶ Each enzyme's active site has a _____ which only allows the substrate with the same shape to bind to it.
- ▶ The way an enzyme and the substrate fit together is known as an **INDUCED FIT**.



Your Turn: Why is an Enzyme and Substrate compared to a Lock and Key? _____

Chemical Reactions:

- ▶ The sum of all cellular reactions that occur in an organism is referred to as _____
 - ▶ In cellular reactions, materials are either produced, maintained, or destroyed
- Types of chemical reactions
- ▶ ANABOLIC (_____)
 - ▶ Small molecules are _____ to form larger molecules
 - ▶ CATABOLIC (_____)
 - ▶ Large molecules are _____ into smaller molecules

Your turn: What process is used in anabolism to build molecules? _____

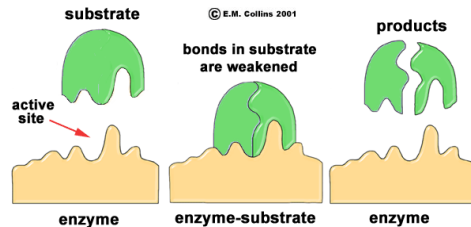
What process is used in catabolism to break apart molecules? _____

Parts of a Chemical Reaction:

- ▶ _____ (S)
 - ▶ The substance an enzyme metabolizes (_____ or _____)
- ▶ _____
 - ▶ The place on the enzyme _____
- ▶ _____ (S)
 - ▶ After the chemical reaction has occurred, the enzyme releases _____

How an Enzyme Works:

1. The _____ to the enzyme at the _____. If the substrate fits in the active site, it forms an induced fit.
2. The substrate binds to the active site, forming an _____.
3. The _____ the two molecules in the substrate _____, forming _____.
4. The products are _____.
5. The _____ goes on to be _____ by another reaction.



Your Turn: A _____ bonds to a _____ and produces the _____

Enzymes Function Best at Specific Conditions:

- ▶ Environmental factors within the cell can affect how an enzyme functions.
 - ▶ HIGH TEMPERATURES
 - ▶ _____ can denature (_____)
 - an enzyme, changing its shape.
 - ▶ LOW TEMPERATURES
 - ▶ _____ can _____ down the _____
 - _____ necessary for a chemical reaction to occur.
 - ▶ OPTIMAL TEMPERATURE
 - ▶ _____ is somewhere in between. The _____
 - _____ for a chemical reaction to occur is at its _____.

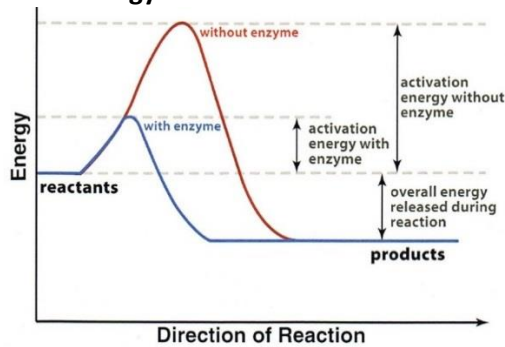
▶ pH

▶ Enzymes function best in environments where the pH range is _____.

▶ The _____ is _____
which function better when the pH is at a range around 2

Your Turn: What two factors affect enzymes? _____

Effect of Enzyme on Activation Energy:



Your turn: How does an enzyme affect activation energy?

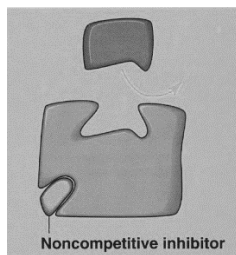
Inhibitors:

▶ Some substances _____ to an enzymes active site.

▶ _____ inhibitor – _____ of the enzyme preventing the substrate from binding to the enzyme



▶ _____ inhibitor – _____ of the enzymes thus changing the shape of the active site.



Your Turn: What is the difference between a competitive and noncompetitive inhibitor? _____

What happens to the enzyme after the cellular reaction is over?

The enzyme goes on to _____ !!!!!!!!!!!!!

Your Turn: What did the enzyme say to the substrate? _____