

ENZYMES

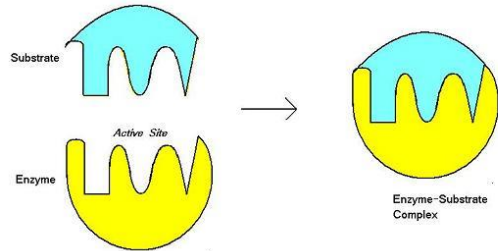
What Are Enzymes?

- ▶ Enzymes are _____
- ▶ 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 _____.

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.

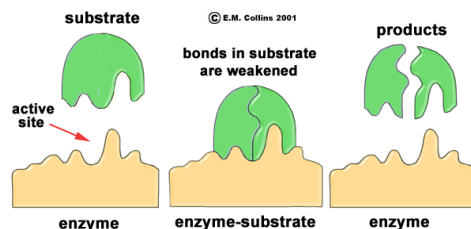


Parts of a Chemical Reaction:

- ▶ _____ (S)
 - ▶ The substance an enzyme _____ or _____
- ▶ _____
 - ▶ The place on the enzyme _____
- ▶ _____ (S)
 - ▶ After the chemical reaction has occurred, the _____ is released from the enzyme.

How an Enzyme Works:

1. The _____ to the enzyme at the _____.
3. The _____ between the two molecules in the substrate is _____ (or connected) forming _____.
4. The products are _____.
5. The _____ goes on to be _____ by another reaction.



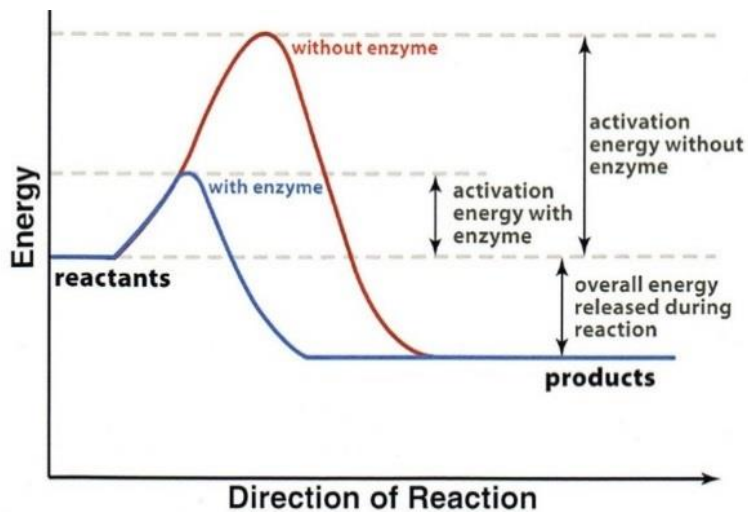
Your Turn: A _____ bonds to a _____ and produces the _____

Enzymes Function Best at Specific Conditions:

- ▶ Environmental factors within the cell can affect how an enzyme functions.
 - ▶ HIGH TEMPERATURES
 - ▶ High temperatures can _____ (destroy) an enzyme, changing its shape.
 - ▶ LOW TEMPERATURES
 - ▶ Low temperatures can _____ down the activation energy necessary for a chemical reaction to occur.
 - ▶ OPTIMAL TEMPERATURE
 - ▶ An optimal temperature is somewhere in between. The activation energy for a chemical reaction to occur is at its _____.
 - ▶ pH
 - ▶ Enzymes function best in environments where the pH range is _____.
 - ▶ The exception is _____ enzymes 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:



How does an enzyme affect activation energy?
It **LOWERS** it!