

## Chemical Reactions

Metabolism - any chemical reaction in a living organism

- Example 1 - digestion of food (breaking down molecules)
- Example 2 - building muscle (putting together molecules)

Reaction Rate (Metabolic Rate) - speed of the reaction

\* For organisms to survive, grow, and maintain homeostasis, their reaction rates must be fast

## Enzymes

Enzymes - proteins that act as biological catalysts

Catalysts - speed up chemical rxns

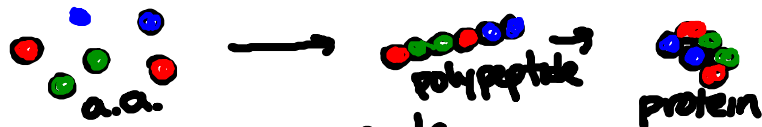
Adding an enzyme to a metabolic reaction \_\_\_\_\_ the reaction rate.

Adding an enzyme will \_\_\_\_\_ the amount of product made.

Adding an enzyme will \_\_\_\_\_ the time needed for a metabolic reaction to occur.

## Enzyme Structure

Enzymes are a type of protein, made of amino acids monomers.



Every enzyme has a different shape because its made of different sequences/chains of amino acids

Active site - part of enzyme that binds to/grabs <sup>(reactant)</sup> substrate

The shape of an enzyme's active site must match shape of substrate

An Enzyme can only catalyze a specific type of metabolic reaction. An enzyme cannot catalyze many

types of reactions because active site is specific to a

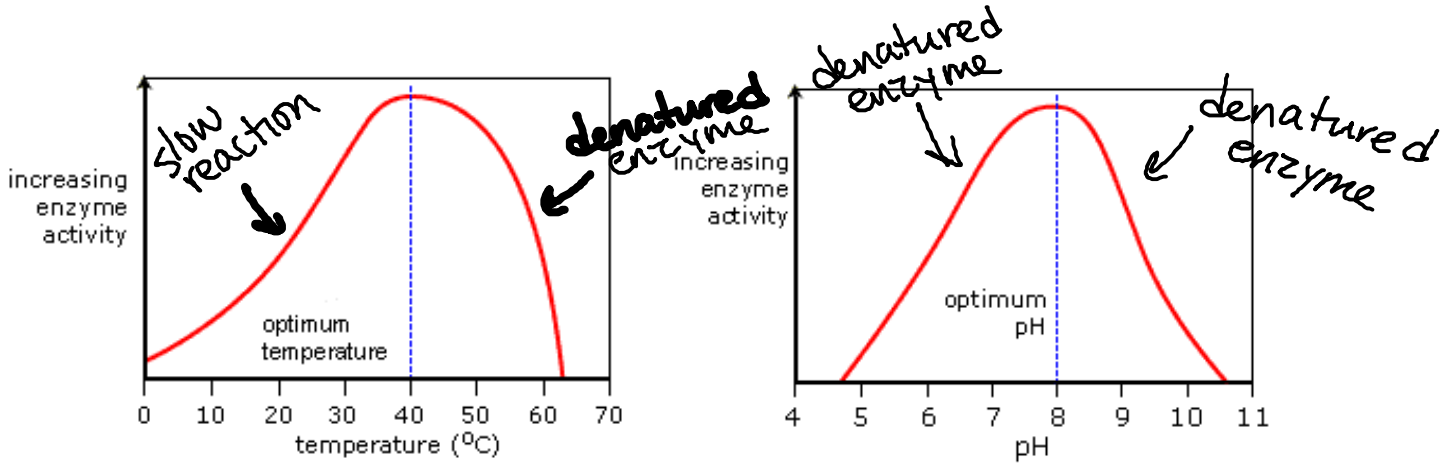
certain type of substrate

## Temperature and pH

2 Factors that affect the shape of an enzyme - temperature & pH (acidity)

Denature - change & destroy an enzymes shape (active site)

Changing an enzyme's shape will cause it to stop working because the active site can't fit w/ the substrate → doesn't catalyze rxn

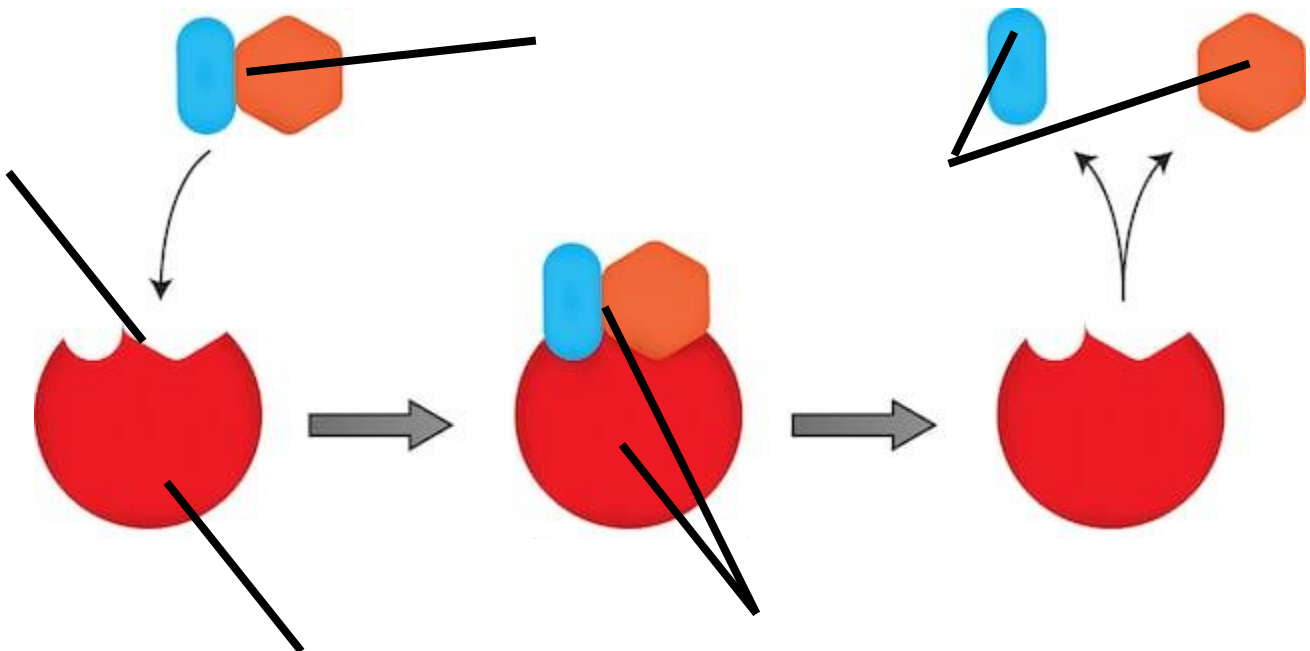


Based on the graphs above, what are the optimum (optimal; best) conditions for this enzyme?

optimum temp = optimum pH =

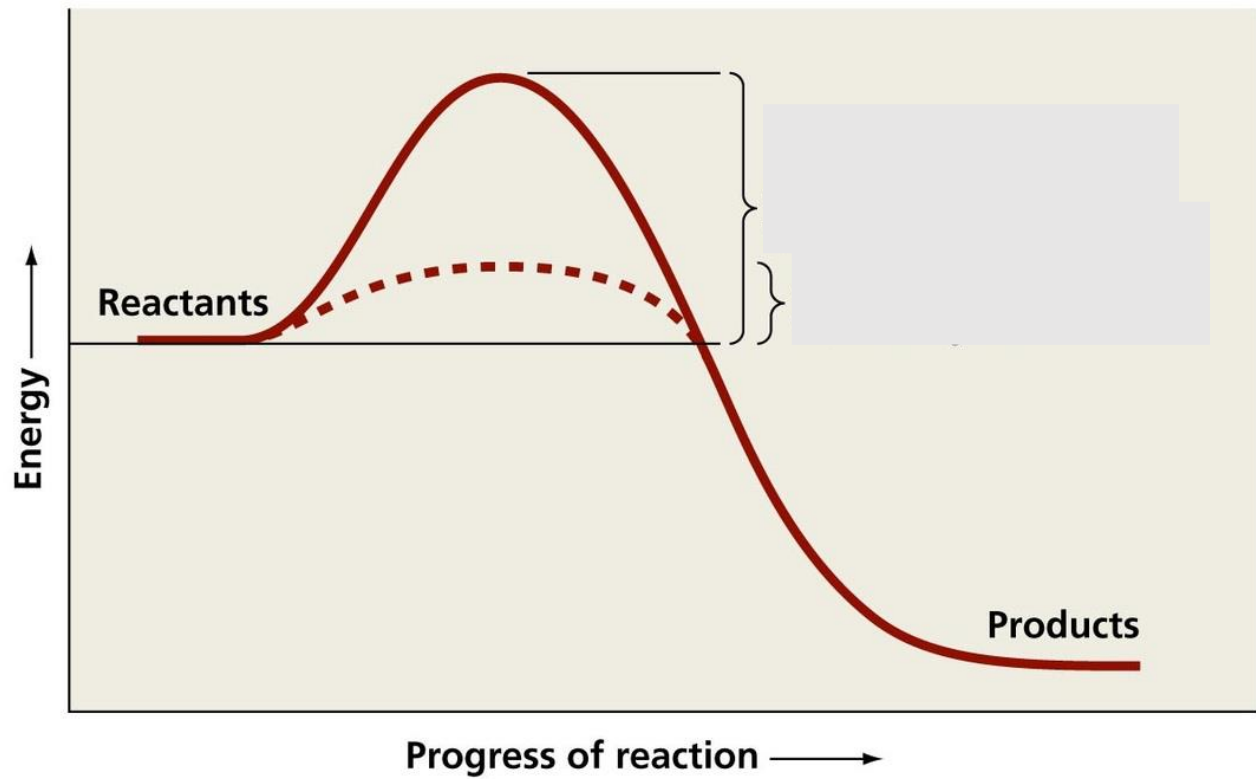
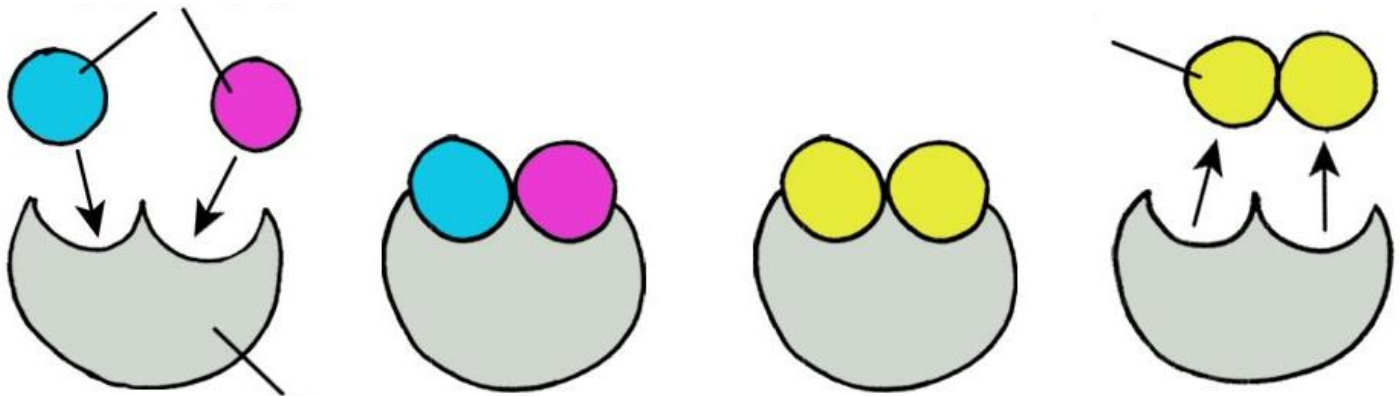
Label the diagram below with the following terms:

Active site	Enzyme	Enzyme-Substrate Complex	Products	Substrate
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Active site	Enzyme	Enzyme-Substrate Complex	Product	Substrates
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Key Term

- Activation energy - \_\_\_\_\_

