Enzymes

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Enzyme Pre-Activity

- Each person receives a cracker
- Put the cracker in your mouth BUT NO NOT CHEW IT
- Hold the cracker in your mouth until I tell you to chew
- What was happening in your mouth?

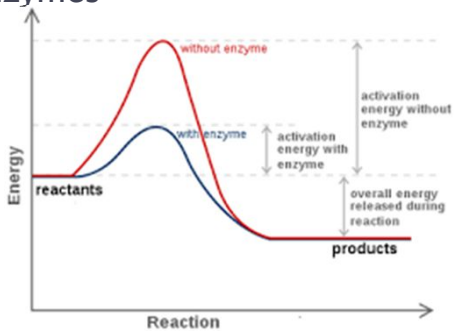
Enzymes

- All living things have chemical reactions going on all the time
- Many of the reactions have HIGH activation energy
  - Remember that means they are very SLOW
- In a living thing, the reactions have to happen fast
  - So something has to be present to speed up the reaction

Enzymes

- Catalyst – lowers the activation E needed to start a chemical reaction
  - does not change how much product is made
  - Does not get used up in the reaction
- Enzymes – special proteins that are biological catalysts
  - speed up the rate of biological processes
  - Essential to life!
  - Does not get used up in a the reaction

Enzymes

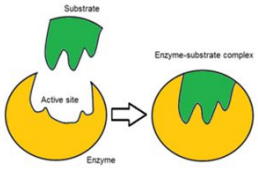


Enzymes

- Name of the enzyme describes what it does
- Example:
  - Amylase – found in saliva
  - Speeds up the start of digestion in your mouth
  - Breaks down Amylose – key part of starch
  - Note how the names sound alike!
- Each enzyme is specific to one reaction

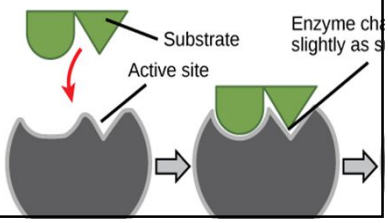
Enzymes

- Substrate
  - Reactants that bind to the enzyme
- Active site
  - Specific location the substrate binds
- Substrate and active site have *complementary* shapes
  - THINK PUZZLE PIECES!
- Only substrates that fit the active site will bind



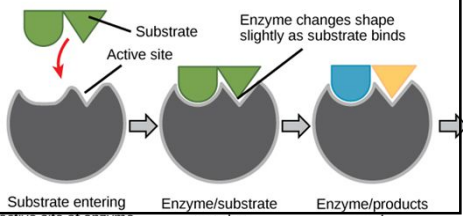
Enzymes

- Once substrates bind to the active site, the active site changes shapes



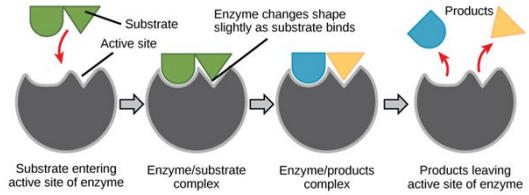
Enzymes

- The newly formed enzyme-substrate complex helps bonds in the reactants break
- Once broken, new bonds form



Enzymes

- Once new bonds are formed, the enzyme releases the new products



Enzymes

- Lots of things can affect how enzymes work
  - pH
  - Temperature
  - Other chemicals
- If the conditions are not right, the enzyme will not work correctly
- This means the biological process might not occur

Enzyme Activity

- With your partner, you will design your own enzyme
- You will create how the substrate and active site look and connect
- Name each appropriately
- On your paper provided, show how the process from beginning to end occurs
- Include a description of what is happening at each step