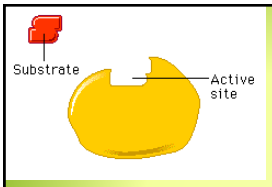
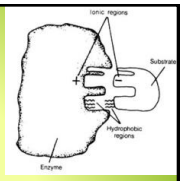
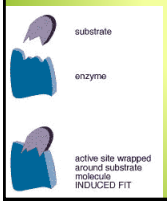
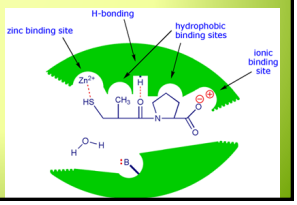




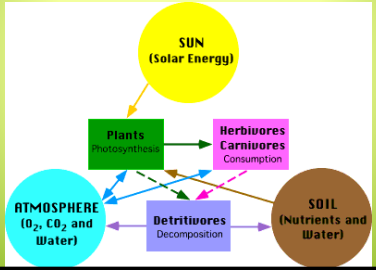
3.1 Enzyme Structure





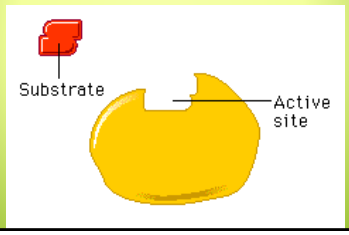
ENDURING UNDERSTANDING

ENE-1 The highly complex organization of living systems requires constant input of energy and the exchange of macromolecules



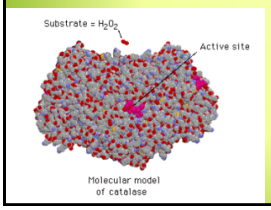
ENE-1.D Describe the properties of enzymes

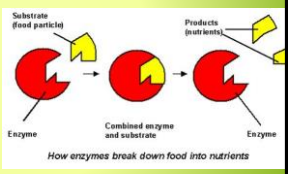
- The structure of enzymes includes the active site that specifically interacts with substrate molecules.
  - Substrates are reactants in an enzymatic reaction.
  - Active site binds to specific substrate(s)



ENE-1.D Describe the properties of enzymes

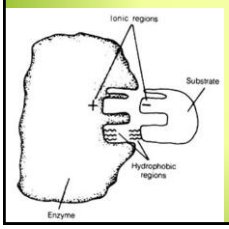
- Enzymes are **catalytic** proteins
- Speed chemical reactions without being changed
- Every enzyme catalyzes only one reaction or one type of reaction.

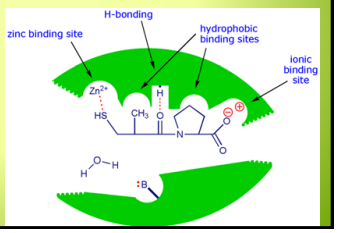




ENE-1.D Describe the properties of enzymes

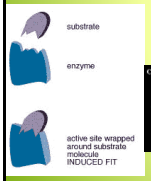
- For an enzyme-mediated chemical reaction to occur, the shape and charge of the substrate must be compatible with the active site of the enzyme.
  - Active site is a microenvironment
  - Lock and Key Model

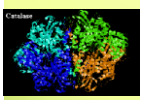


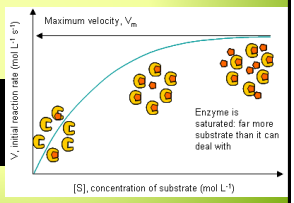


ENE-1.D Describe the properties of enzymes

- **Induced-fit** model
  - Slight change in enzyme shape when substrate binds
  - Facilitates the reaction
- When all enzymes are filled (saturated) reaction can't go faster
- Most enzymes named adding the ending "-ase."







Cofactors and Coenzymes

- Many enzymes require an inorganic ion or nonprotein cofactor to function
- The enzyme may only become active when all the appropriate cofactors or coenzymes are present and bind to the appropriate sites on the enzyme.
- Cofactors- inorganic ions (iron,zinc, copper)
- Coenzymes- Organic cofactors (vitamins)