

Biomolecules

Primary TEKS Supported

9A – [Reporting Category 1] – compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids

9C – [Reporting Category 4] – identify and investigate the role of enzymes

TEKS Also Supported

4B investigate and explain cellular processes, including ~~homeostasis, energy conversions, transport of molecules, and~~ synthesis of new molecules [polymers]

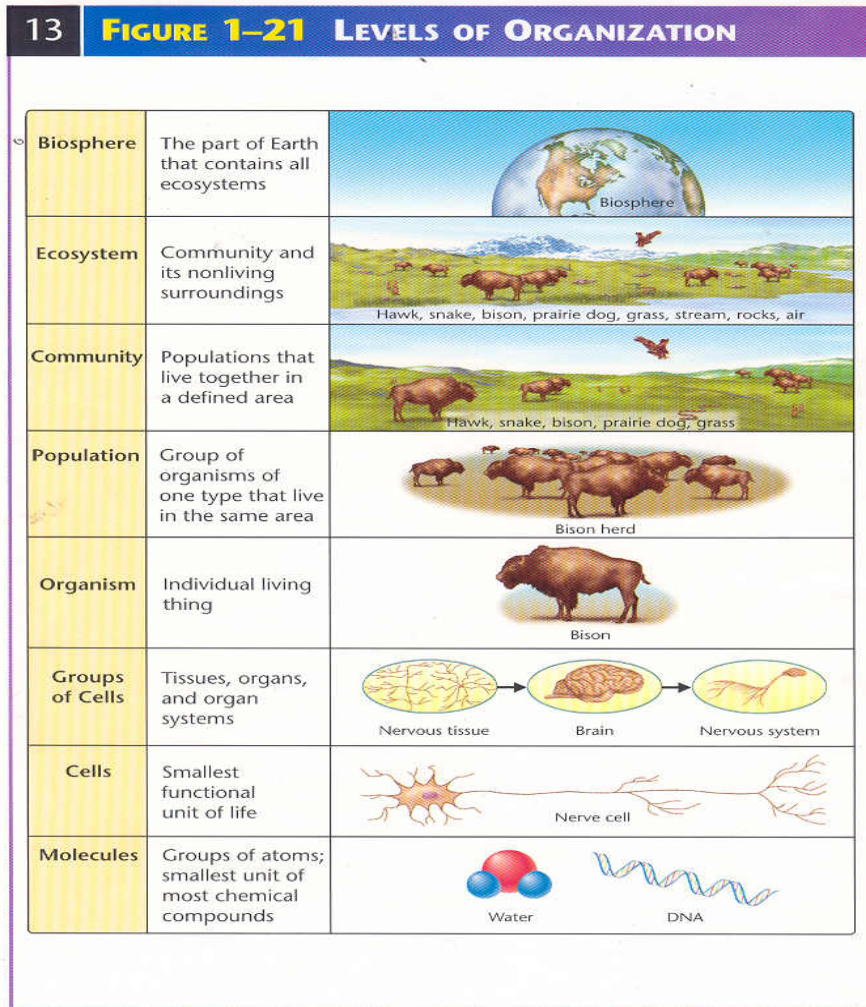
10C analyze the levels of organization in biological systems and relate the levels to each other and to the whole system

Contents of This Packet

- I. Review and Practice
- II. Vocabulary Cards
- III. Practice Items
- IV. Sapling Instructions

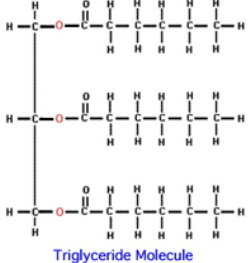
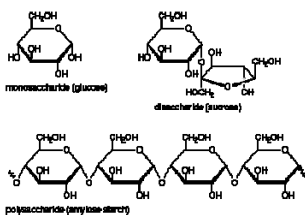

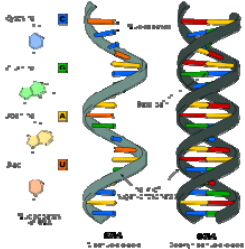


Levels of Organization



Biomolecules: 4 macromolecules that make up living organisms

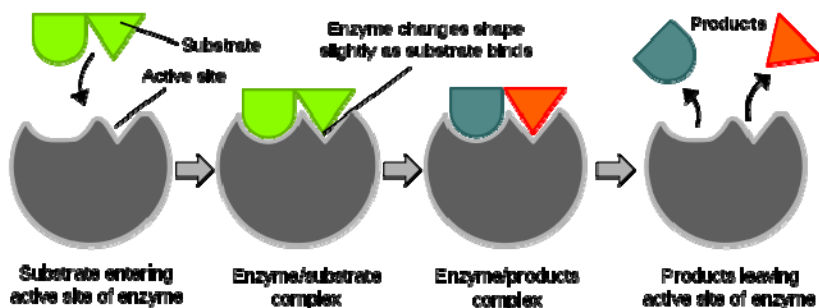
1. Biomolecules are macromolecules

	Lipids	Carbohydrates	Proteins	Nucleic Acids
What is it? Function?	Stores long-term energy	Provides fast, immediate energy	Most multifunctional molecule—makes bones, muscles, enzymes	Carries and transmit genetic code
Picture				
Elements	C, H, O	C, H, O	C, H, O, N	C, H, O, N, P
Monomers	No mono/polymer, but it's made up of 3 fatty acid chains	Monosaccharide	Amino Acid	Nucleotide
Polymers		Polysaccharide	Polypeptide; Protein	Nucleic Acid, DNA, RNA
Examples	Fats Oils	Simple and complex sugars (like candy) and starches (like pasta)	Muscles → Meat Hormones Enzymes	DNA RNA

Enzymes: are types of proteins that are catalysts that speed up chemical reactions

1. Enzymes speed up chemical reactions – like chemically digesting your food.

Reactants → Products
Things you need → What you make



Parts of the Enzyme Reaction

1. Enzyme – protein that speeds up chemical reactions
2. Substrate – Food; what you're trying to break down
3. Active Site- enzymes are specific so only the correct substrate will fit into the enzyme's active site
4. Enzyme/Substrate Complex – Enzymes and substrates combined
5. Products – the substrate broken apart

2. Example:



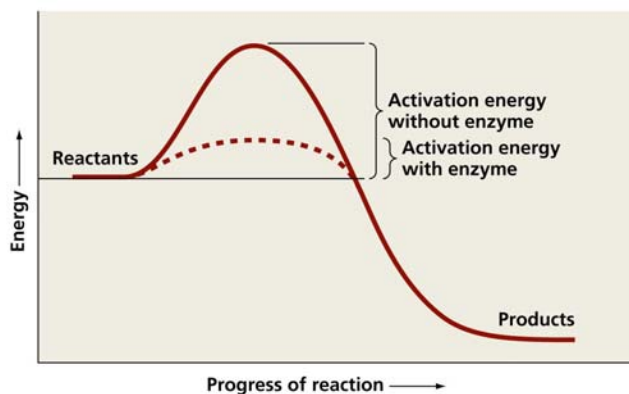
3. Enzymes are specific to what they break down and Usually ends in “-ase”

- i. Amylase- found in saliva, breaks down carbohydrates
- ii. Protease- found in stomach, breaks down proteins
- iii. Lipase- found in small intestines, breaks down lipids

4. Enzymes are “reusable.”

5. Enzymes work by reducing the amount of energy needed to complete a chemical reaction so it occurs faster.

6. Activation Energy Graph



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Enzymes reduce the amount of activation needed to complete a chemical reaction.

Activation energy is the amount of energy needed to complete a reaction by using reactants (ingredients- substrate/food + enzyme) to create a product (broken down substrate/food).

7. Other factors can affect how enzymes work—

- i. Temperature
- ii. Number of substrates
- iii. pH level