Organic Molecules: (Biomolecules)
4.A.1. The subcomponents of biological molecules and their sequence determine the properties of that molecule.

3.1 **Organic Molecules** contain C and H atoms
Four classes of organic molecules (biomolecules): *Carbohydrates, Lipids, Proteins, and Nucleic Acids*
Organic characteristics: Contain C and H atoms, Covalent Bonding, Large molecule, Living organisms

Carbon chain is called its skeleton or backbone.
2.A.3.a.1 Carbon moves from the environment to organisms where it is used to build carbohydrates, proteins, lipids, or nucleic acids. Carbon is used in storage compounds and cell formation in all organisms.

Functional groups: Specific moieties which bind to the carbon skeleton and give it a characteristic structure and function. Help determine the chemical reactivity and polarity of organic molecules.

Hydroxyl -	Carbonyl-
Carboxyl-	Amino-
Sulfhydryl-	Phosphate-
Methyl-	

Monomer -
Polymer -

4.A.1.a. Structure and function of polymers are derived from the way their monomers are assembled.

Category	**Subunits** or Monomer	Polymer	Not polymer
Carbohydrate	Monosaccharide	Polysaccharide	
Lipids	**Glycerol and Fatty Acids**		Fat
Proteins	Amino Acids	Polypeptide	
Nucleic Acids	Nucleotide	DNA, RNA	

Dehydration Reaction - Chemical reaction - subunits are joined together. Water is produced. Example: Connect monomers together to make polymers.
Example: Glucose monomers together to make starch.
Hydrolysis: Chemical reaction - water molecule is added to break a covalent bond. Example: Breakdown polymer to monomer.
Example: Breakdown starch into glucose.

Synthesis and Degradation: (Dehydration synthesis and Hydrolysis) - **needs enzymes to speed up the reaction.** They are not consumed or changed.

CARBOHYDRATES:
4.A.1.a.4 Carbohydrates are composed of sugar monomers whose structures and bonding with each other by dehydration synthesis and bonding with each other by dehydration synthesis determine the properties and functions of the molecules. Illustrative examples include: cellulose versus starch.

Functions: Energy Source and provide materials for structure
Carbon, Hydrogen, and Oxygen in a 1:2:1 ratio.

Monosaccharides: Single sugar; simple sugars
Glucose, Fructose, Galactose (Hexoses)
Ribose, and Deoxyribose (Pentoses)

Disaccharide - two monosaccharides joined together by dehydration synthesis
Lactose: Galatose and Glucose
Sucrose: Glucose and Frutose
Maltose: Two glucose molecules

Polysaccharide - polymer of monosaccharides
Starch - energy storage in plants
Glycogen - energy storage in animals
Cellulose - Cell walls of plants
Chitin - Cells walls of fungi and exoskeleton
Peptidoglycan - Cell walls of bacteria