

Macromolecules Worksheet

Compounds can be organic or inorganic

Organic - compounds that contain both carbon and hydrogen atoms

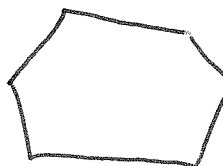
Inorganic - compounds that DO NOT contain both carbon and hydrogen

There are **four** classes of organic compounds that are central to life on earth.

1. Carbohydrates
2. Lipids
3. Proteins
4. Nucleic Acids

Carbohydrates (Sugars and Starches)

1. Functions - energy
 - a. Sugar - quick energy
 - b. Starch - long term energy
2. Make up - C, H, and O
 - a. Monosaccharides - carbohydrate made up of one type of sugar (ex. Glucose)
 - b. Disaccharides - carbohydrates made up of two sugars bonded together
(ex. Glucose + Glucose = Maltose)
 - c. Polysaccharide - complex carbohydrate made up of chains of monosaccharides
ex. *Starch* - food storage compound found in plants
Cellulose - makes up the cell wall of plants
Glycogen - a food storage compound in animals



Lipids (Fats, Oils, Waxes)

1. Function
 - a. Fat - stores energy (twice as much as carbohydrates)
 - b. Plant Wax
 - c. Cholesterol
2. Make-Up - C, H, and O (less oxygen than in carbohydrates)
Triglyceride - consists of 3 fatty acids and one molecule of glycerol
(fatty acids are made from CH₂ units)
3. Insoluble in Water
4. Fats that are in a liquid state at room temperature are OILS

Proteins (long chains of amino acids)

1. Functions
 - a. Enzymes
 - b. Hormones
 - c. Structural Parts of Organisms
2. Make-Up - C, H, O, and N
 - a. There are 20 different kinds of amino acids
 - b. amino acids are held together by a peptide bond (when a peptide bond is formed, a molecule of water is lost)
 - c. Dipeptide - two amino acids joined together by a peptide bond
Tripeptide - dipeptide and an amino acid
Polypeptide - long chain of amino acids

Nucleic Acids (made up of nucleotides)

1. Functions
 - a. DNA - stores genetic information
 - b. RNA - makes proteins
2. Make-Up
 - a. made up of nucleotides
 - b. a nucleotide consists of a 5-carbon sugar group, a phosphate group, and a nitrogenous base
3. There are two basic kinds of nucleic acids. Ribonucleic Acid (RNA) which contains the sugar ribose and deoxyribonucleic acid (DNA) which contains the sugar deoxyribose.
4. DNA - 2 strands of nucleotides; RNA - 1 strand of nucleotides

Enzymes - with few exceptions, they are proteins

Catalyst - substance that speeds up the rate of a chemical reaction.

Living organisms contain enzymes, which are catalysts

Characteristics of Enzymes

- Are not used up in a reaction
- Combine with substrates
- Speed up the rate of a reaction

Enzymes are used for digestion, respiration, reproduction, vision, movement, and thought.

Substrate - reactions that are affected by an enzyme

Active Site - region where substrate binds to the enzyme