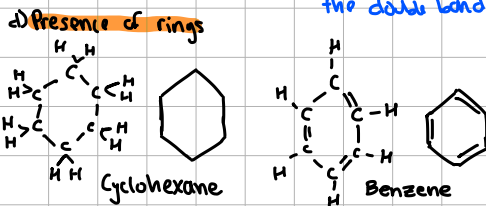
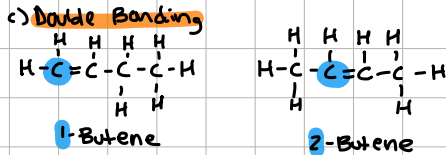
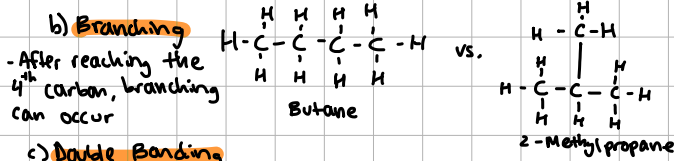
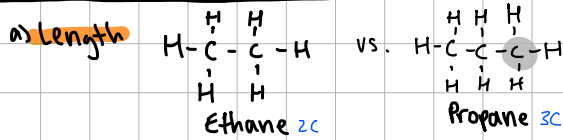
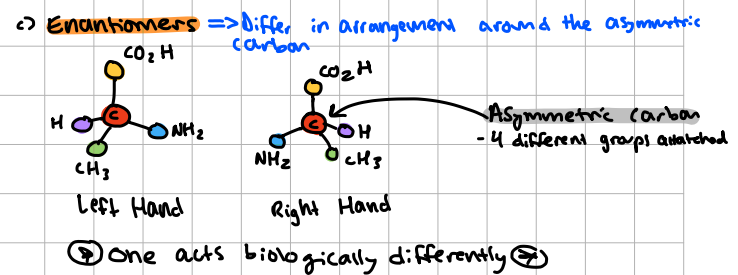
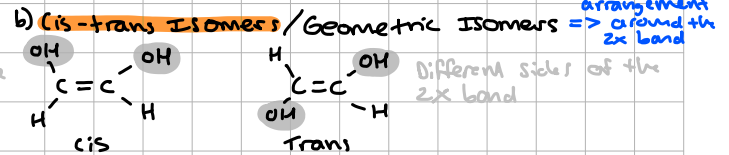
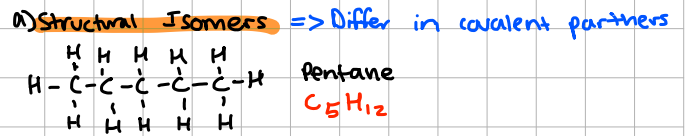


Chapter 3: Carbon & Molecular Diversity

Variation in Carbon Skeletons



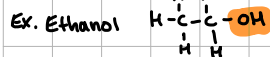
Isomers SAME MOLECULAR FORMULA



Functional Groups

Hydroxyl Group -OH

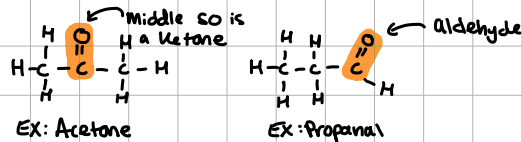
- Alcohols



Carbonyl Group C=O

- Ketones & Aldehydes

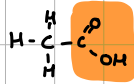
Within the carbon skeleton (Ketone) or on the end of the carbon skeleton (Aldehyde)



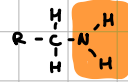
Carboxyl Group -COOH

- Carboxylic acid or organic acid

Ex: Acetic Acid



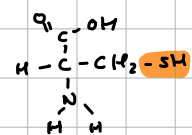
Amine Group -NH₂



Sulfhydryl Group -SH

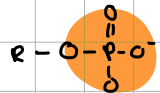
- Thiols

Ex: Cysteine



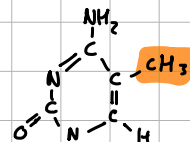
Phosphate Group -OPO₃²⁻

- Organic Phosphate



Methyl Group -CH₃

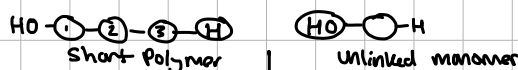
- Methylated compound



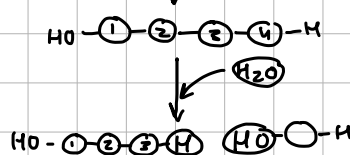
Macromolecules

Breakdown & Synthesis of Polymers

a) Dehydration Synthesis rxn



b) Hydrolysis

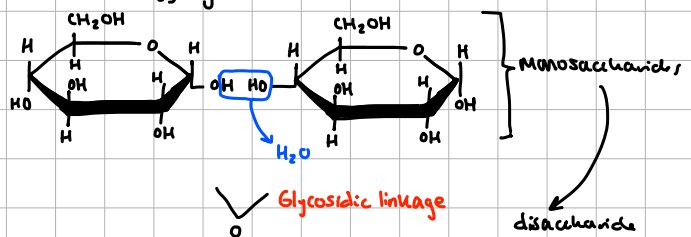


1. Carbohydrates

- monosaccharides

- CH_2O in a ratio of CH_2O

- energy = glucose



- Polysaccharides

- hundreds or thousands of monosaccharides bonded

- storage & structural polysaccharides

Glycogen in animals

Starch in plants

- α 1-4 linkages

- stored in plastids

Cellulose

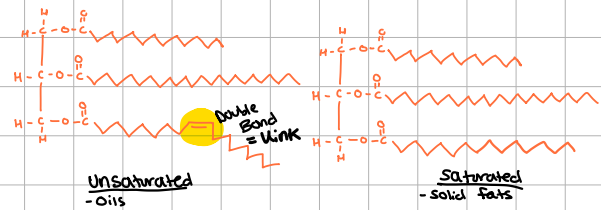
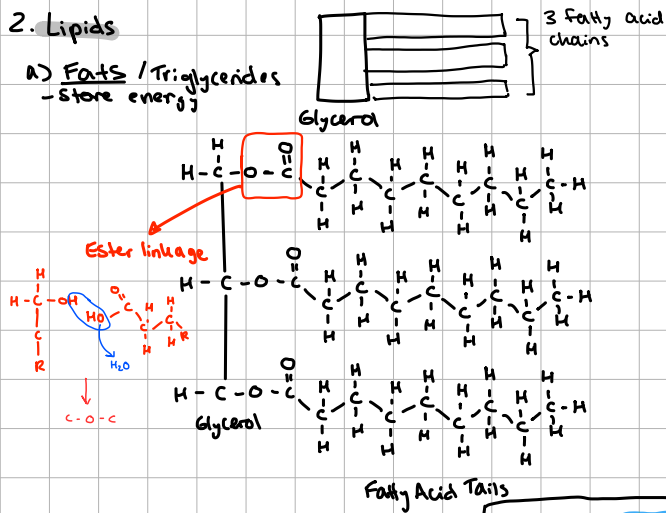
- plant cell walls

- cannot be digested by humans

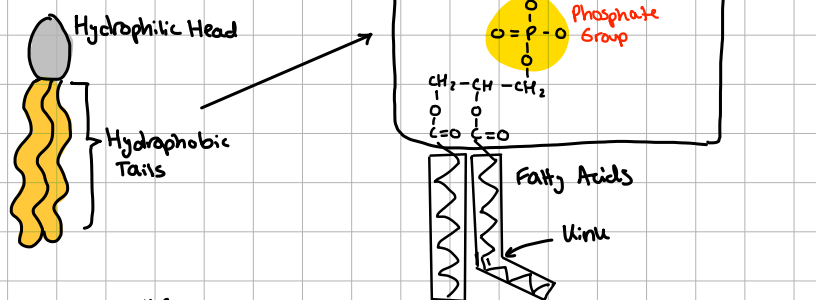
2. Lipids

a) Fats / Triglycerides

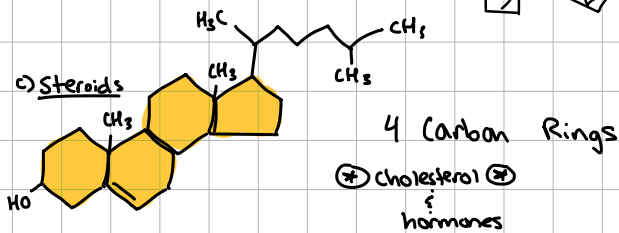
- store energy



b) Phospholipids



c) Steroids

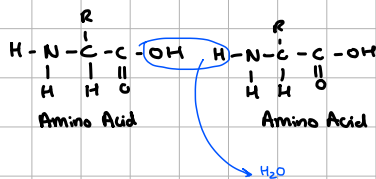


3. Proteins

- monomers are amino acids

- R side chains determine what kind of protein

- nonpolar side chain → hydrophobic
- polar → hydrophilic



C — N Peptide Bond

- 4 levels of protein structure

1. Primary structure → Sequence of amino acids

- determined by genes

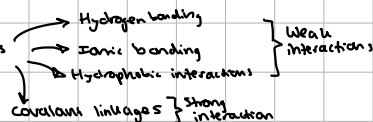
2. Secondary structure → Repeated coiling & folding of the peptide backbone

- Stabilized by Hydrogen bonds

α helix or β pleated sheet

3. Tertiary structure 3D Shape of a protein

- Changes in shape is determined by R side chains



4. Nucleic Acids

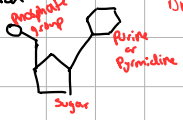
- store the hereditary information

Ex. DNA & RNA

- monomers are nucleic acids

Flow of genetic information

DNA $\rightarrow$ RNA $\rightarrow$ protein



Joined by phosphodiester bonds

