

- Organic molecules are the molecules in living things
- There are four types of organic (carbon-based) molecules:

–Carbohydrates

–Lipids (fats)

–Proteins

–Nucleic Acids

Lipids

- Include Fats, oils, waxes, hormones
- Stores energy in body
- Long chains of fatty acids



Function

- Store energy
 - Contain a lot of calories in a small space
- Provide barriers
 - Structural support for cells

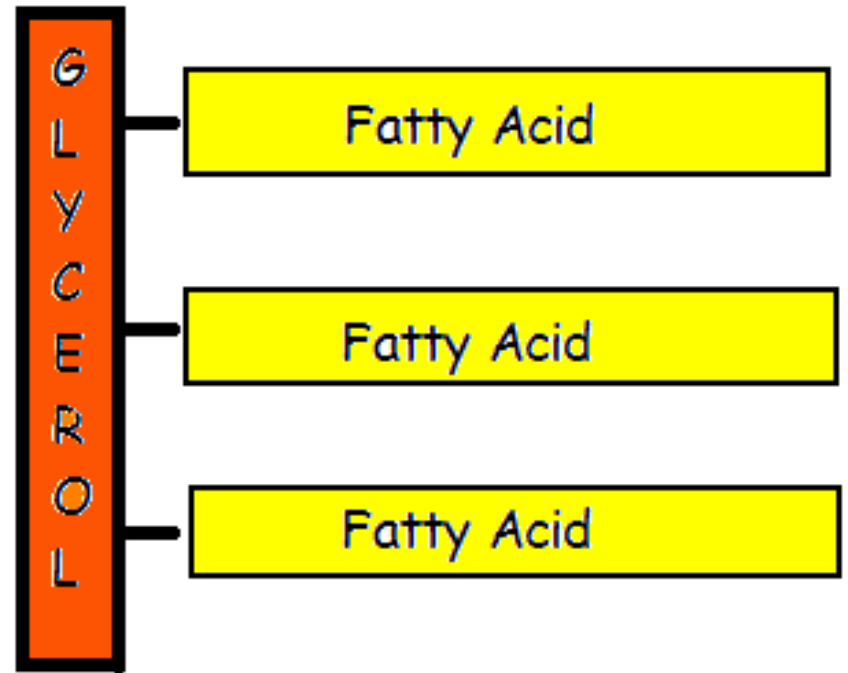
Solubility

- Lipids are *soluble* (dissolve) in oil
- Lipids are *insoluble* (don't dissolve) in water
- This is why oil and water don't mix!
- Carbs are soluble in water but insoluble in oil

Structure of Fats

Fats = fatty acids + glycerol.

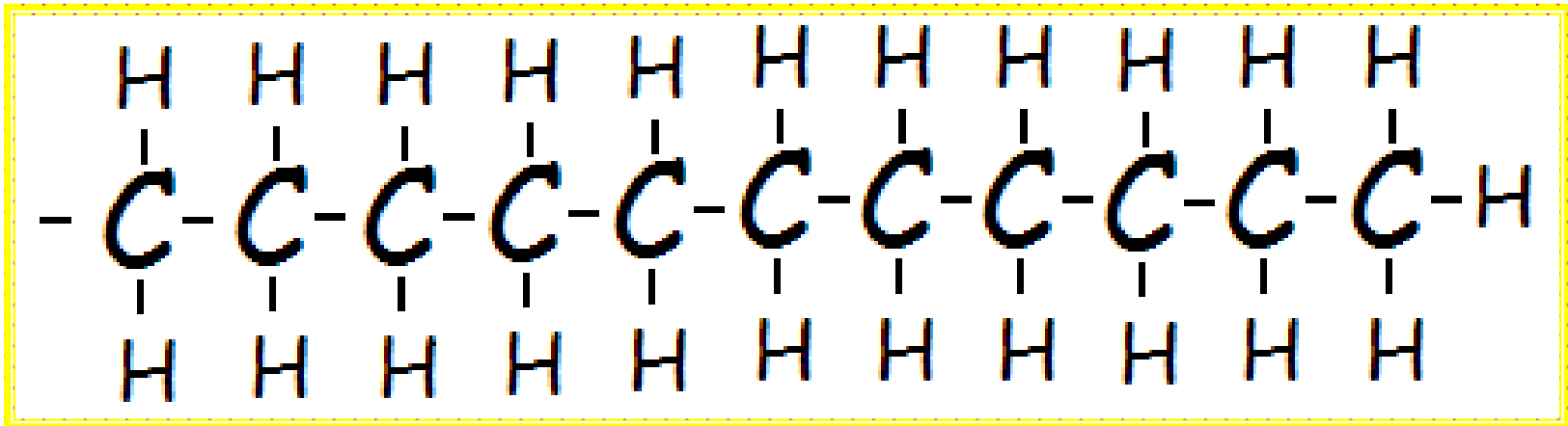
Triglyceride = three fatty acids (tri-) + glycerol (glyceride)



Fatty Acids

Fatty acids = carbon/hydrogen chains

*Fatty Acids are the monomers of lipids

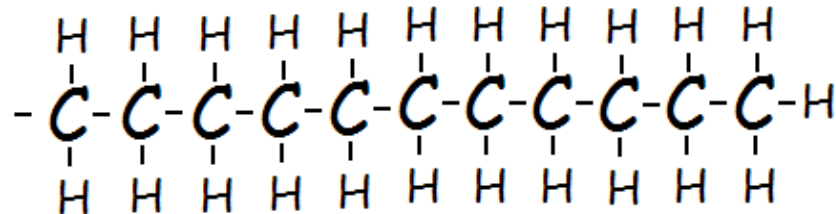


Carbon backbones with hydrogen ribs on each side

Types of Fats

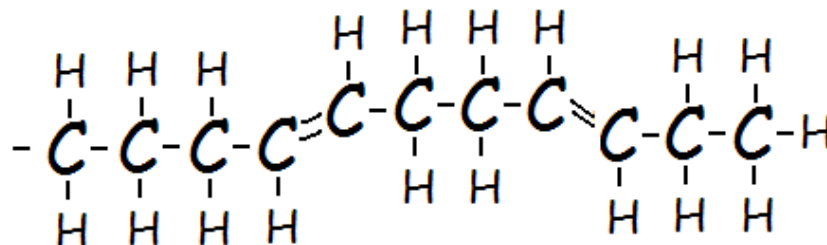
Saturated Fats:

- All carbon-carbon single bonds
- The fatty acid is saturated with hydrogen



Unsaturated Fats:

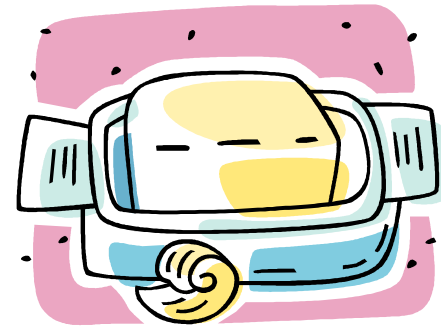
- Some Carbon=Carbon double bonds
- The fatty acid is not saturated with hydrogen.



Characteristics of Fats

Saturated Fats:

- Solid at room temperature
- Unhealthy fats
- Butter, lard, crisco



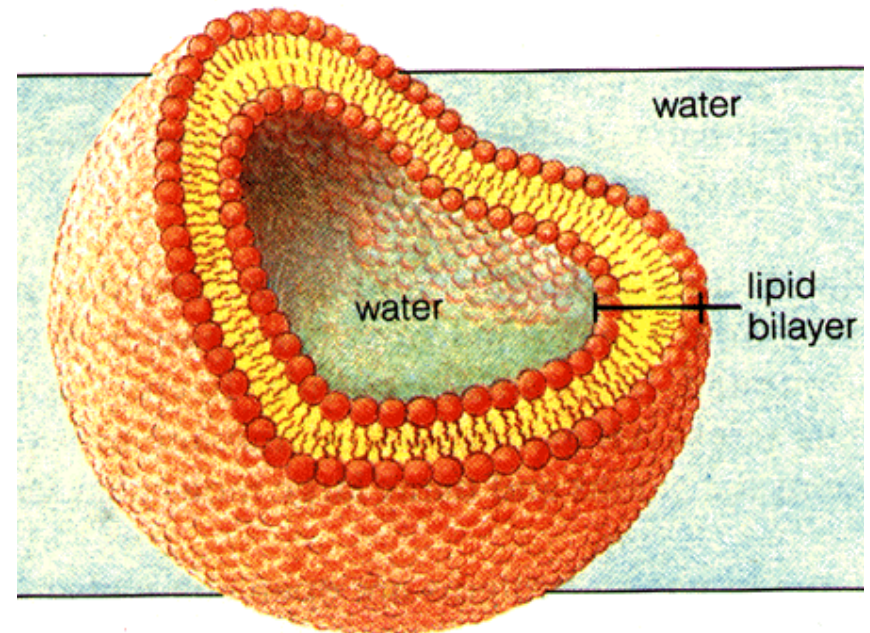
Unsaturated Fats:

- Liquid at room temperature
- Healthy fats
- Oils

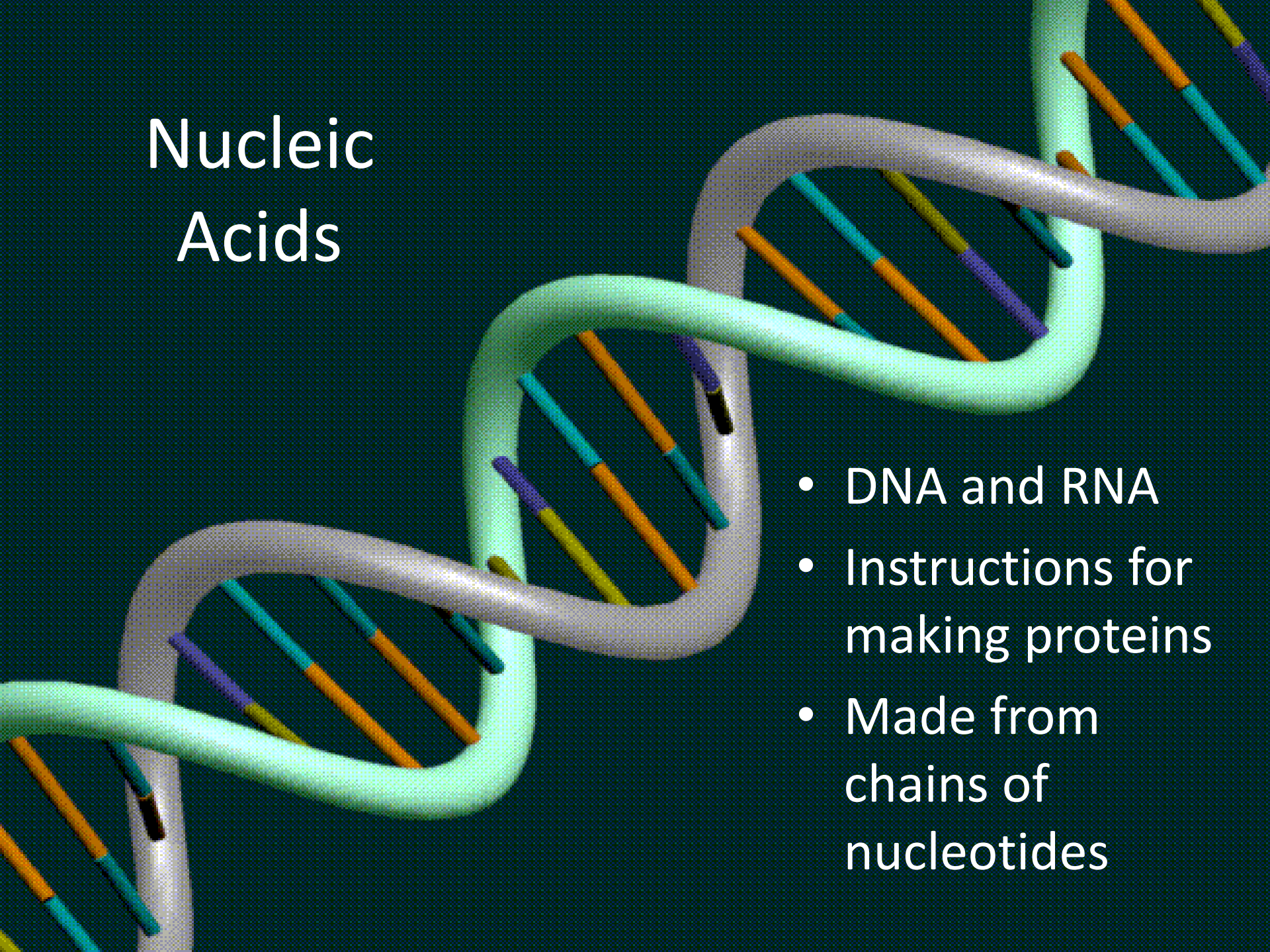


Examples of Lipids

- Steroids
- Phospholipids
 - Major component of all cell membranes
 - Form lipid bilayers



Nucleic Acids



- DNA and RNA
- Instructions for making proteins
- Made from chains of nucleotides

Function

- Store and communicate genetic information

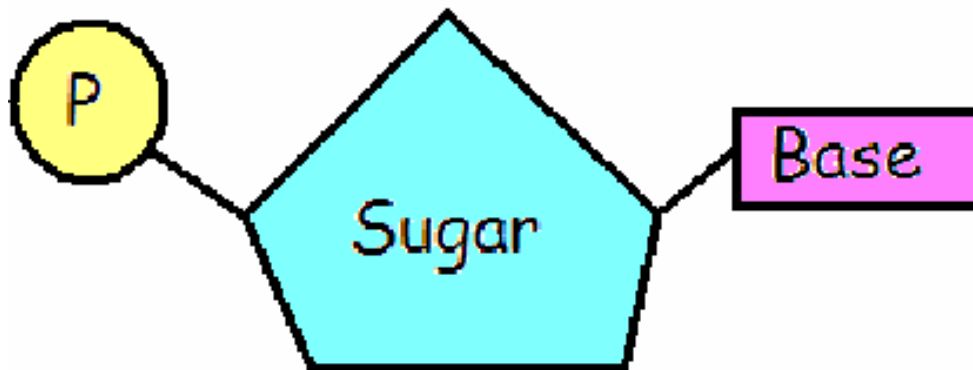


Nucleotides

*Nucleotides are the building blocks/monomers of nucleic acids

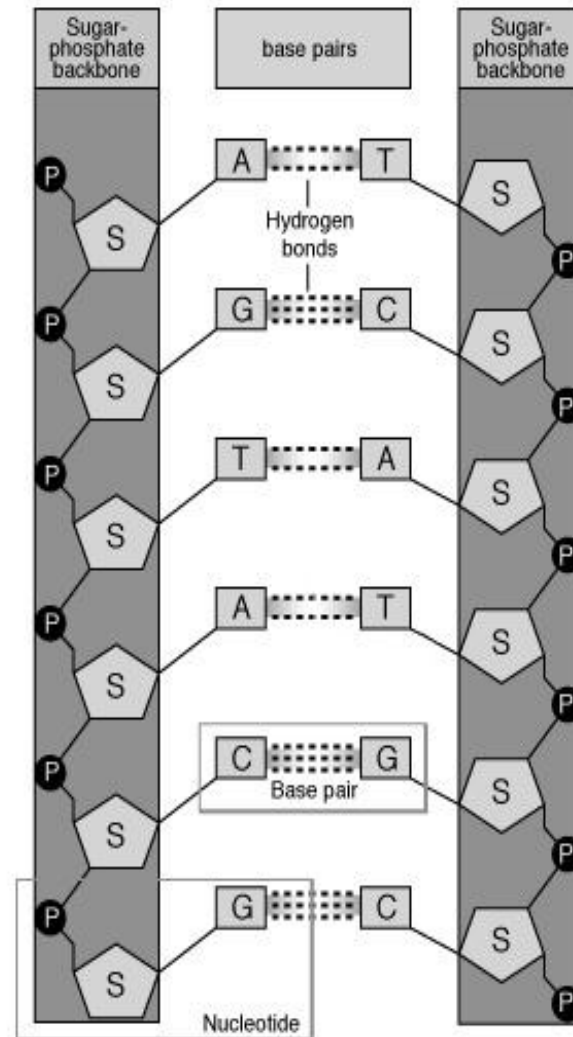
Three parts:

- A sugar
- A phosphate group
- A nitrogen base



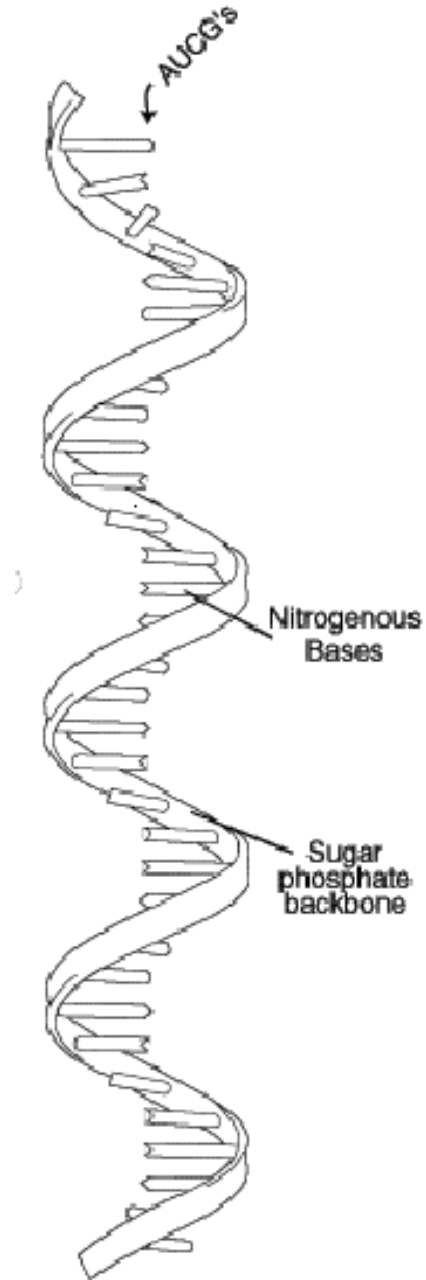
The Double Helix of DNA

- Two strands, like a ladder.
 - Rails = alternating sugars and phosphates
 - Rungs = nitrogen bases
 - Bases hold strands together
- Double helix



The Single Helix of RNA

- RNA is a copy of DNA.
- RNA has **one** strand
- Rail = sugar and phosphate
- The bases hang from the sugars



Polymer

Monomer

Carbohydrate

Monosaccharide

Lipid

Fatty acid

Protein

Amino Acid

Nucleic Acid

Nucleotide