

Aim: What are the molecules of life?

Do Now: List the elements & compounds cycled through ecosystems.

Homework:

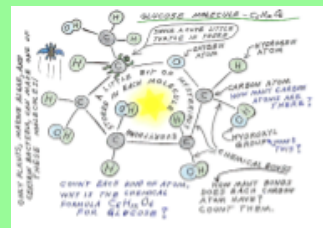
Read pp. 59- 63 P. 63 # 1,2,3,4,5

Vocabulary: Carbohydrate, lipid, protein, amino acid, nucleic acid, nucleotide, DNA, RNA, ATP.
Valence electrons, Covalent bonds, molecules, monosaccharide, polysaccharide,

All Living Organisms Require Organic Molecules

Sugars are the building blocks of Carbohydrates

Examples: Glucose (monosaccharide)
Fructose (monosaccharide)
Sucrose (disaccharide)- table sugar



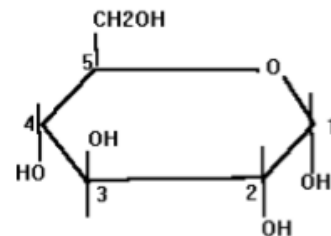
A. Carbohydrates

1. Structure

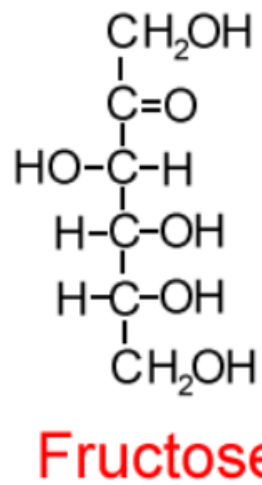
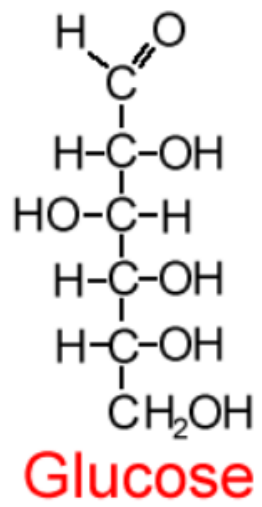
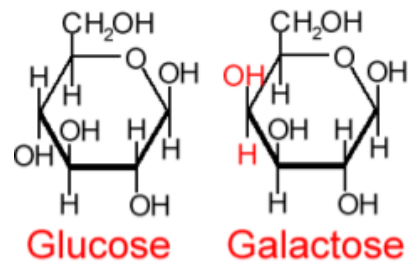
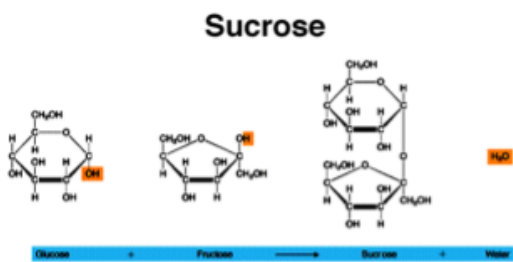
- formed from carbon, hydrogen, & oxygen
- C atoms bond to each other to form chains or rings
- a nutrient from plants/ producers
- two simple sugars (monosaccharide- glucose) can link to form a di- or poly- saccharide (sucrose)

2. Function

- major source of energy for organisms
- provide structural support
- ex: Chitin (insect exoskeleton) & cellulose (plants)



Glucose Molecule



High fructose corn syrup

- originates corn
- fructose - is the type of monosaccharide found in corn
- Syrup - concentrated sugary composition (thick, sticky)
- high - concentration level - has very little water

Aim: What are lipids?

Do Now : Copy these notes

1. Structure

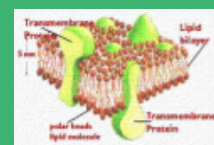
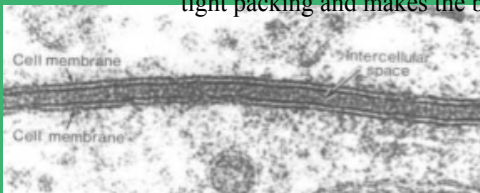
- chains of carbon atoms bonded to each other and to hydrogen atoms > **Lipids repel water**

2. Function

- storing energy > fat molecules are converted from carbs & back to carbs if needed when food not available
- controlling water movement > makes up the cell membrane, "Phospholipid bilayer" 1 layer made of water, 1 made of long carbon chains, repels water
- lipid bilayer gives the membranes its fluid characteristics

ex: Feathers of birds coated with oils help "waterproof" them

The presence of the double bond prevents tight packing and makes the bilayer difficult to freeze.



Brown Paper Bag Lipid Test 11/12/09 LE3, LE5



Fats

Liquid at room temp

Unsaturated

- Canola olive safflower vegetable

Saturated

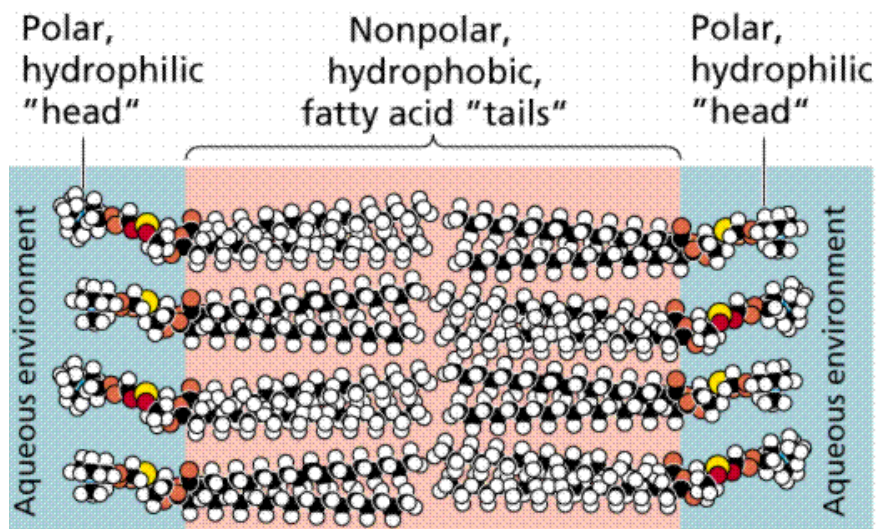
- vegetable oil, butter

Hydrogenated

- solid at room temp

Fats margerine, lard
"butter alternatives")
Cool whip

Phospholipid Bilayer



Polar molecules cannot pass through this membrane without external aid

11/16/09

**Aim: What are the molecules of life (cont.):
Proteins & Nucleic Acids**

Do Now:

What are the building blocks of carbohydrates?

What is the role of lipids in our bodies?

Homework

Use pp. 60-63 P. 63 # 6, 7

Proteins

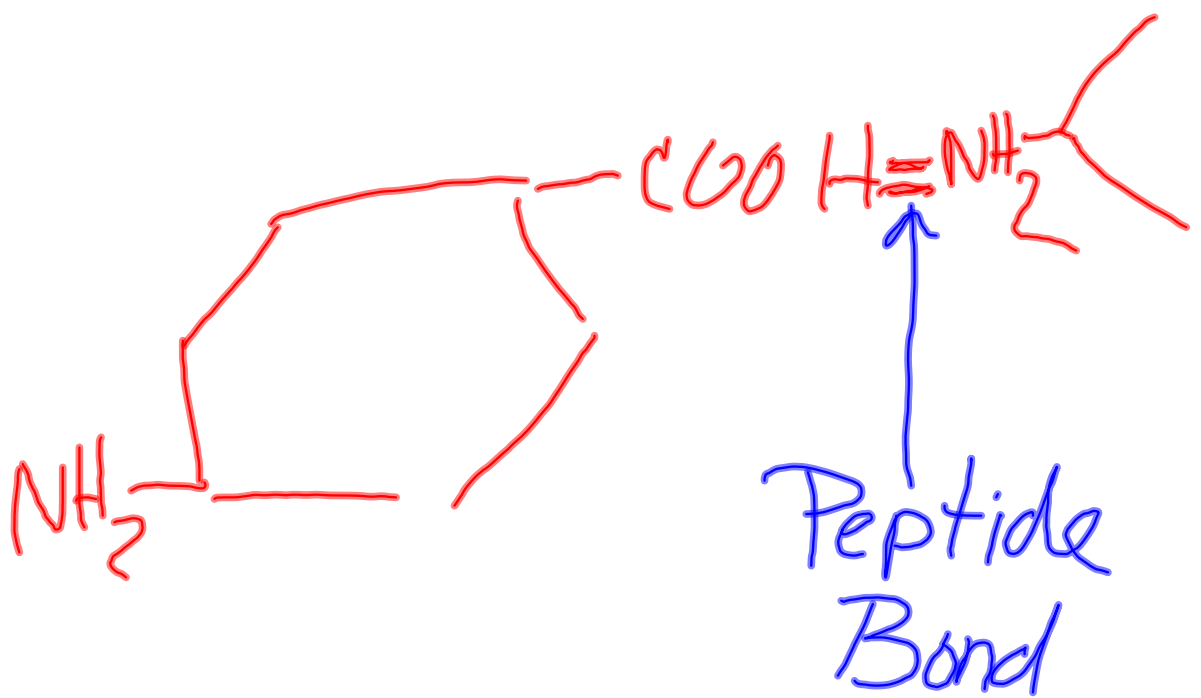
THEY RULE YOUR LIVES!

Definition: chains of amino acids that twist & fold into certain shapes that determine what the proteins do

Example: Some proteins provide structure & support (Muscle Tissue)
Some proteins carry out important chemical reactions in the body (they break down food in your digestive system)

Structure

- large molecule
- made of amino acids (aa) - there are 20 essential aa's
- recognized by its amino group (-NH₂) & carboxyl group (-COOH)
- Must have nitrogen to make amino acids
- aa's link together by peptide bonds
- to get aa's your body must take in proteins
- ***Enzymes are Proteins***



Nucleic Acids

Definition: Made of smaller units called nucleotides

Nucleotide: Contains 3 parts- a sugar, a base & a phosphate group

Nucleic Acids: your body has only 2: DNA & RNA

DNA - sugar is deoxy ribose-----Deoxyribonucleic acid

RNA- sugar is ribose-----Ribonucleic acid

4 Nucleotide bases of DNA : A,T,C,G

Adenine (A)
Thymine (T)
Cytosine (C)
Guanine (G)

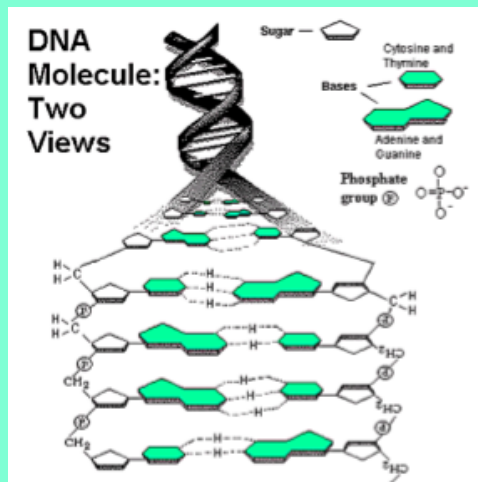
A ↔ T
C ↔ G

4 RNA Nucleotide Bases: A, U, C, G

Adenine (A)
Uracil (U)
Cytosine (C)
Guanine (G)

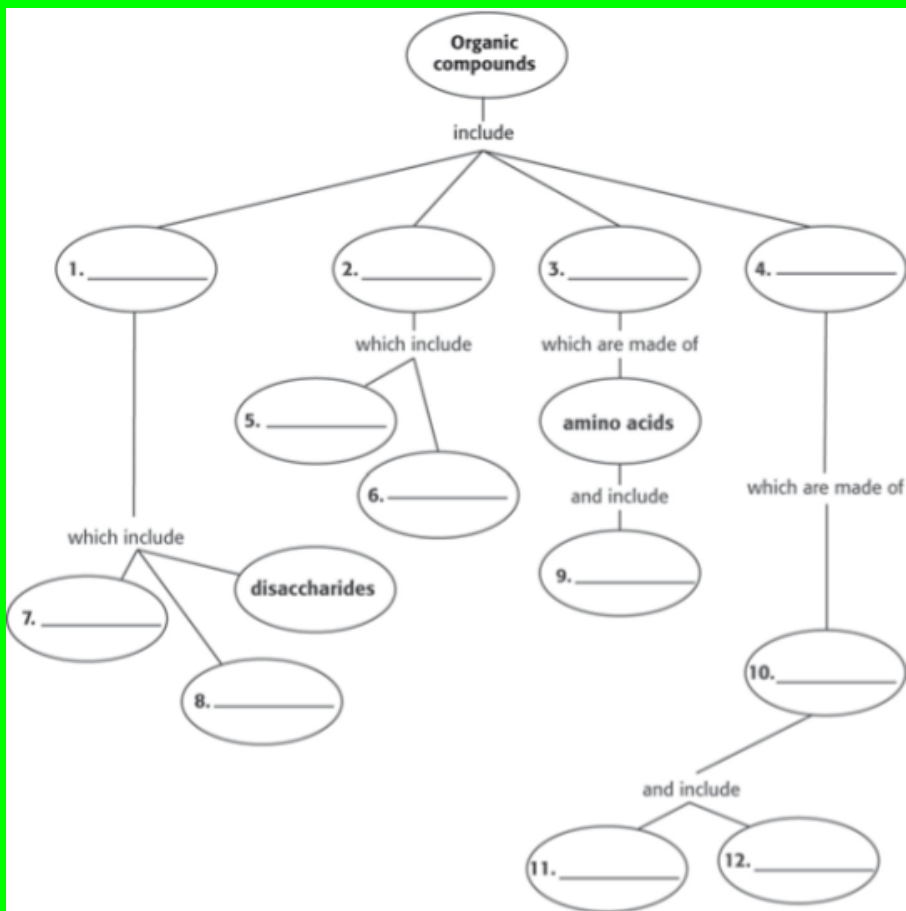
A → U
T → A
C ↔ G

single strand



Functions of Nucleic Acids & Nucleotides

Function	Description
Heredity	<ul style="list-style-type: none">• DNA stores & transmits genetic info. between organisms• DNA molecule contains the genetic code/ instructions for producing all the proteins in an organism
Energy Transfer	<ul style="list-style-type: none">• ATP is the main molecule that cells use to transfer energy• ATP = Adenosine triphosphate• Consists of a single nucleotide connected to two additional phosphate groups• There are other energy- transferring molecules that also contain nucleotides



- carbohydrates
- DNA
- enzymes
- fats
- lipids
- monosaccharides
- nucleic acids
- nucleotides
- phospholipids
- polysaccharides
- proteins
- RNA

