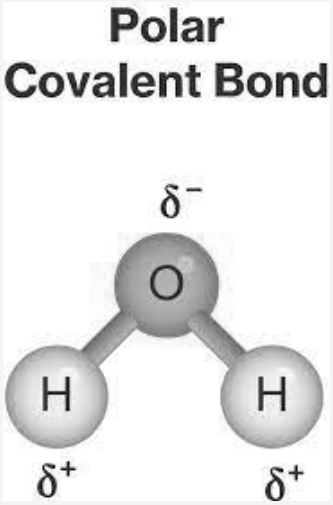
AP Biology: Unit 1 Cheat Sheet

by kmz_2022 via cheatography.com/145729/cs/31430/

Water Molecule



- 1:2 ratio (oxygen to hydrogen)
- oxygen end (-) & hydrogen end (+)

Water Structure/Hydrogen Bonding

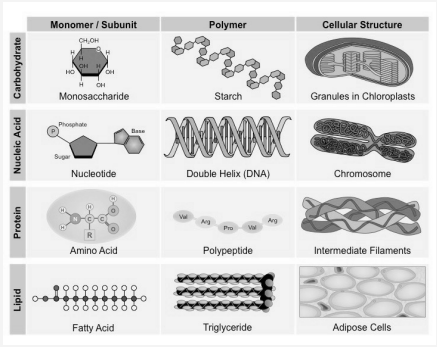
cohesion:	2 of the SAME molecules hydrogen bonding
adhesion:	2 DIFFERENT molecules hydrogen bonding
surface tension...	strong hydrogen bonds between water molecules
capillary action...	results from cohesion and adhesion (ex. water up roots)
high solvency due to....	adhesive property

Elements of Life

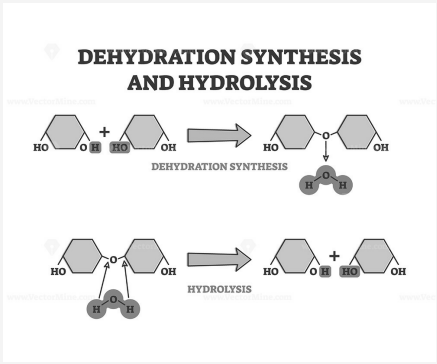
macromolecule	Carbon (C)	Nitrogen (N)	Phosphorus (P)
carbohydrate~	✓		
protein~	✓	✓	
nucleic acid	✓	✓	✓
lipid	✓		✓*

* only in phospholipids

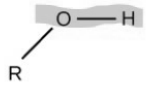
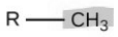
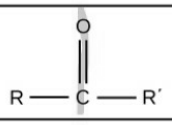
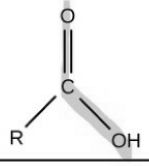
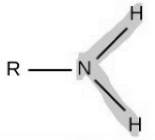
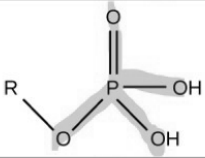
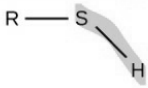
Macromolecule chart



Forming/Breaking Down Macromolecules



Functional Groups

Functional Group	Structure
Hydroxyl	
Methyl	
Carbonyl	
Carboxyl	
Amino	
Phosphate	
Sulfhydryl	

*Carbonyl ketone~ C=O within skeleton

*Carbonyl aldehyde~ C=O & C-H at the end of skeleton

Intro to Macromolecules

monomer	➔	polymer	(formed by covalent bonds)

	monomer		polymer
carbohydrate	monosaccharide	disaccharide	polysaccharide
protein	amino acid	dipeptide	polypeptide
nucleic acid	nucleotide	dinucleotide	polynucleotide
lipid	fatty acid		triglyceride

Carbohydrate Structure

alpha glucose	-OH on **bottom** (right)
beta glucose	-OH on **top** (right)

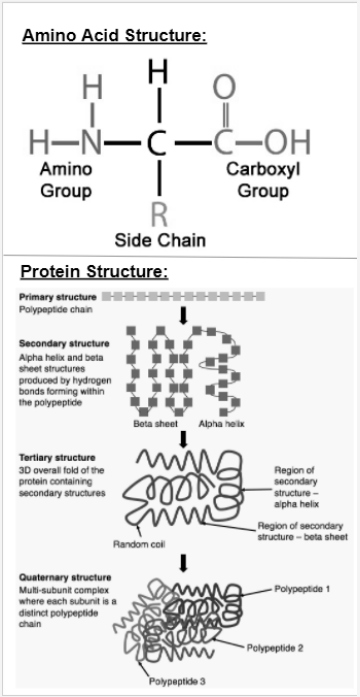
	purpose	where	bond(s)
amylose	energy storage (starch)	plants	alpha 1-4
amylopectin	energy storage (starch)	plants	alpha 1-4; alpha 1-6 (branched)
glycogen	energy storage (starch)	animals	alpha 1-4; alpha 1-6 (branched)
chitin	structural support	animals (fungi)	beta 1-4; H bonds

Carbohydrate Structure (cont)

cellulose	structural support	plants	beta 1-4; H bonds

# of carbons	group name	formula	examples
3	triose	$C_3H_6O_3$	glyceraldehyde
5	pentose	$C_5H_{10}O_5$	ribose; ribulose
6	hexose	$C_6H_{12}O_6$	glucose; fructose; galactose

Protein Structure



*tertiary and quaternary interact through "R" groups (disulfide bridges, hydrogen bonds, hydrophobic interactions, & ionic bonding)
- change in structure/shape = change in function
- 8 functions:
Enzymes; Defense; Storage; Transport; Hormones; Structure; Receptor; Contractile
(**E**very **D**ragon **S**teals **T**reasures **H**iding **S**ecretively '**R**ound **C**astles)

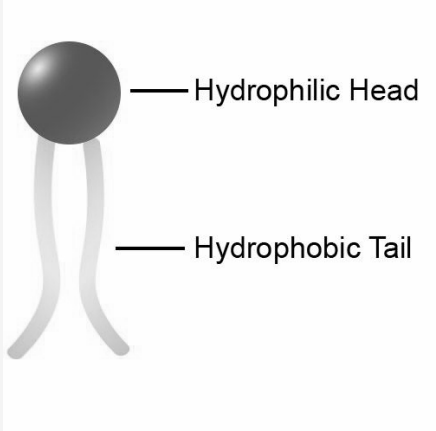
Nucleic Acid Structure

3' hydroxyl end	5' phosphate end
nucleotide monomers connected by...	covalent bond
adenine & guanine	purines (2 rings)
cytosine & thymine	pyrimidines (1 ring)
A - T	held together by 2 hydrogen bonds
G - C	held together by 3 hydrogen bonds
DNA~	deoxyribose, thymine, double-st-randed (antiparallel)
RNA~	ribose, uracil, single-stranded

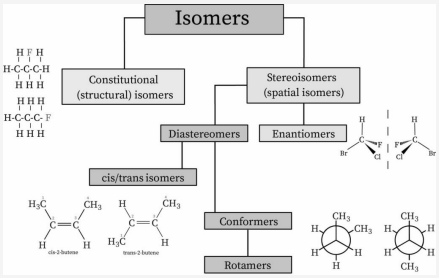
Lipid Structure

function:	energy storage and structural support
saturated fatty acid	solid at room temp., single bonds, straight
unsaturated fatty acid	liquid at room temp., 1+ double bond, bent
triglyceride~	glycerol with **3** fatty acids
phospholipid~	glycerol with **2** fatty acids & phosphate group
examples)	fats, oils, waxes, and steroids

Phospholipid



Isomers



- **isomer:** compounds that have the *same number of atoms* of the same elements but *different structures*/properties
- **structural isomers:** *differ* in the covalent *arrangements of their atoms*
- **cis-trans isomers:** covalent bonds to the same atoms, but *differ in their spacial arrangements*

(cis = atom on same side trans = atom on different sides)

- **enantiomers:** *mirror images* of each other and differ in shape