

Biochemistry Test 11/5

IB BOOK Chapter 3 sections  
1 & 2 (p. 52 - 61) SL

(46-54) HL

### Topic Breakdown:

Water (Properties, structure, importance): 30%

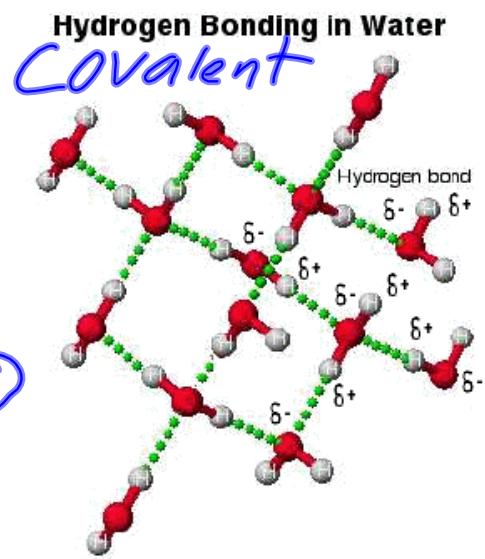
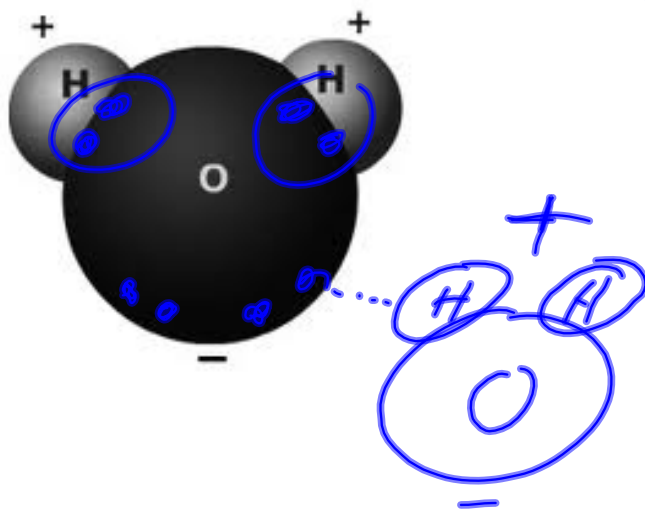
Organic molecule Roles: 25%

Organic Molecule Structure: 25%

Basic Chemistry (Atomic structure,  
Bonds, Polar vs nonpolar): 10%

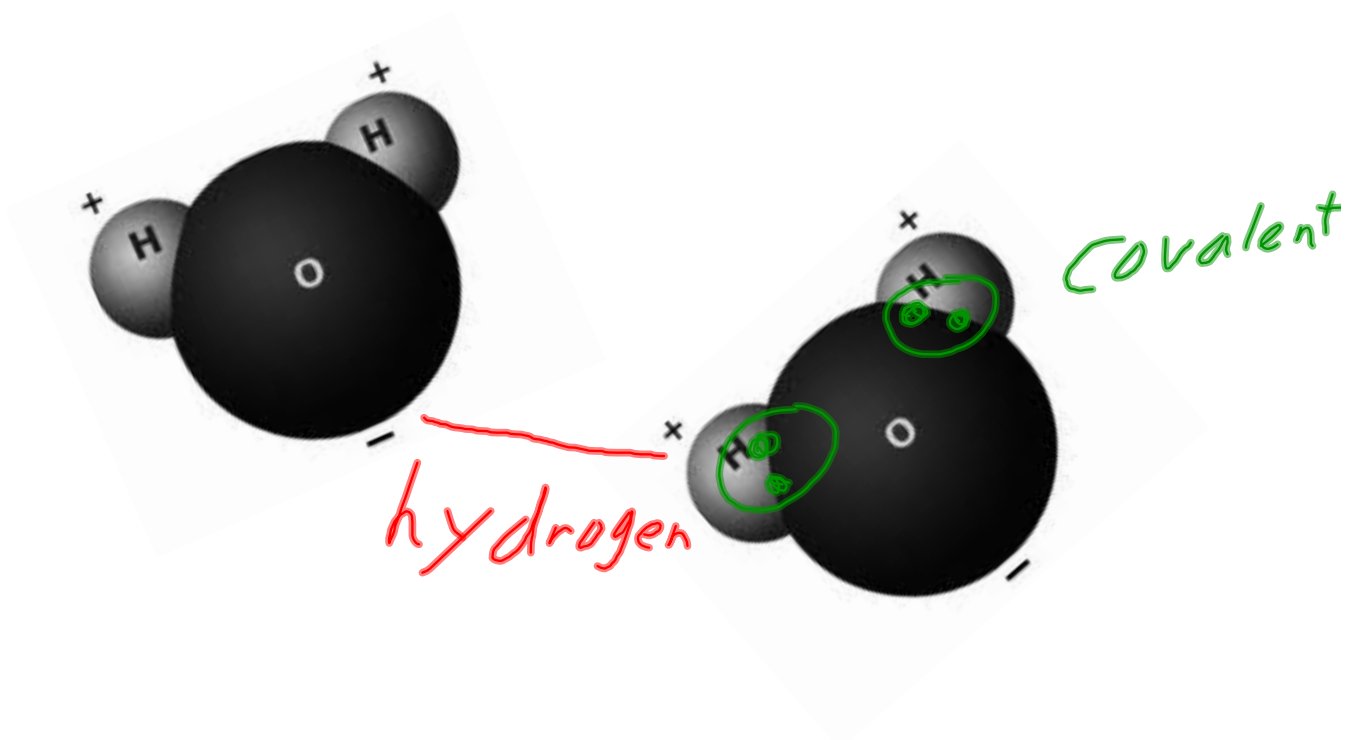
Elements in living things 10%

# Water

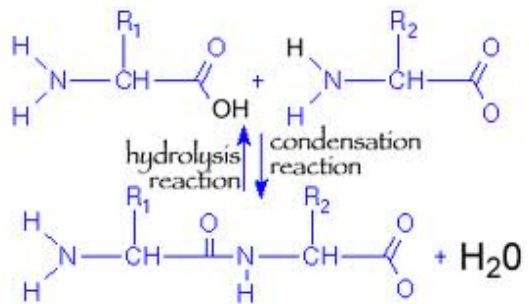
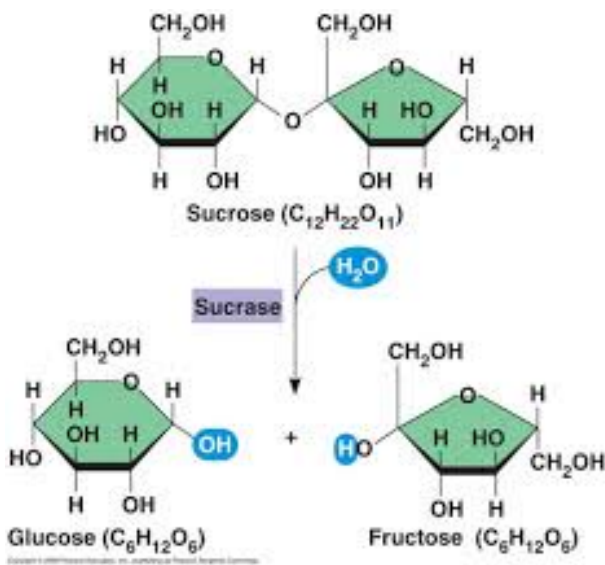


C. Ophardt, e. 2003

Temperature added to water 1st breaks the hydrogen bonds. Water absorbs large amounts of heat while not changing its temperature very much. **How does this affect living things?**



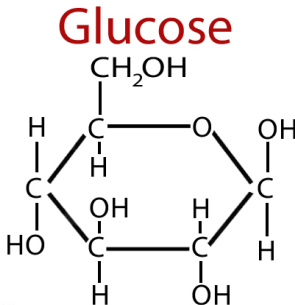
## Ionic vs covalent



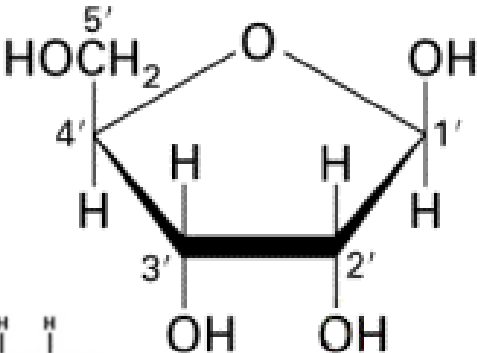
Anabolism  
Condensation combines

Hydrolysis separates  
Catabolism

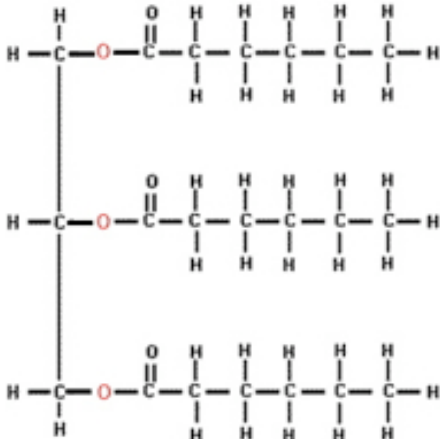




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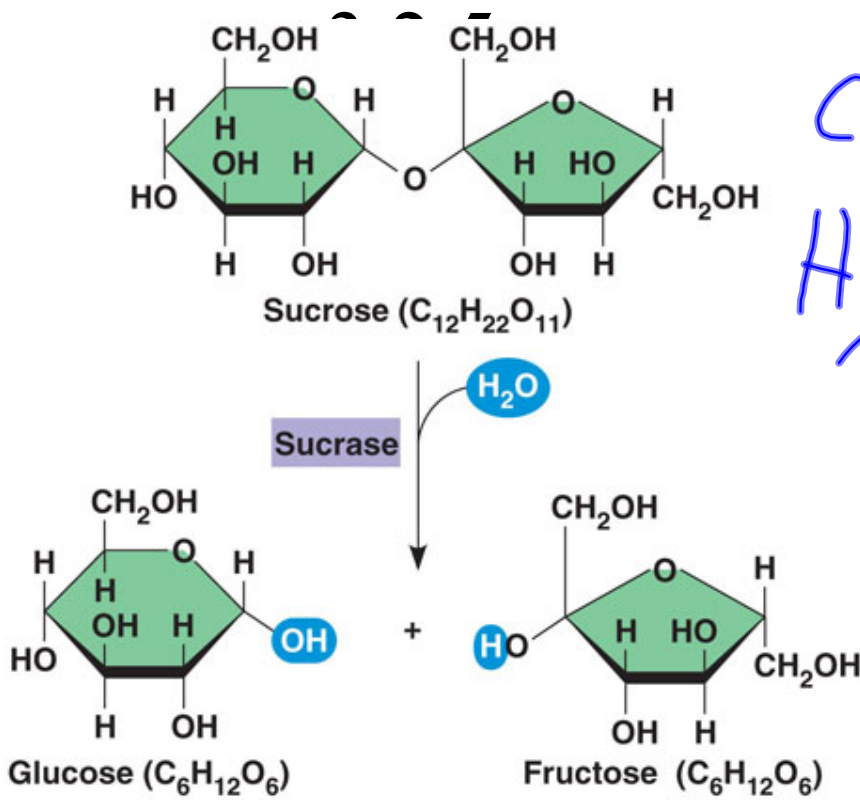


**Ribose**



**Triglyceride Molecule**





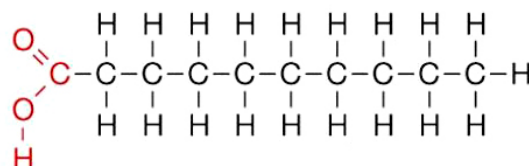
Catabolic  
↓  
Hydrolysis  
1 → 2

## Importance of Carbon

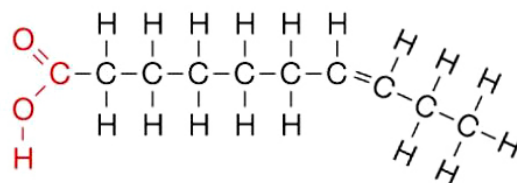
Carbon skeleton

Carbon bonding

### Saturated



### Unsaturated



Additional Water Properties: 3.1.5

Cohesion

Polarity

Adhesion

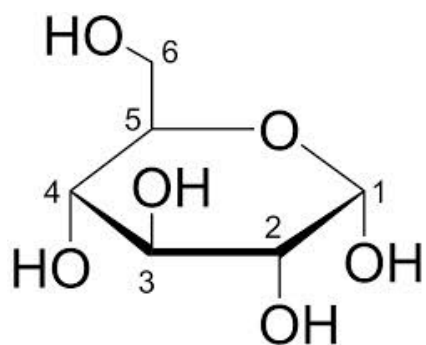
Solvency

Thermal

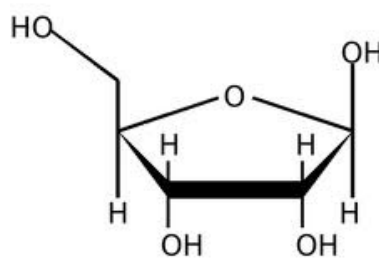
Density

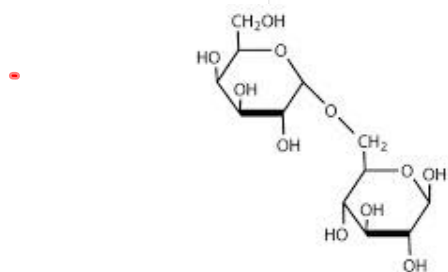
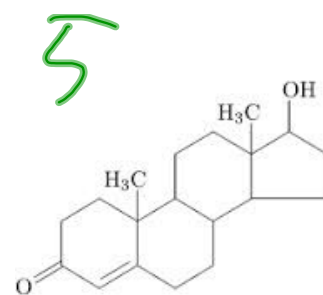
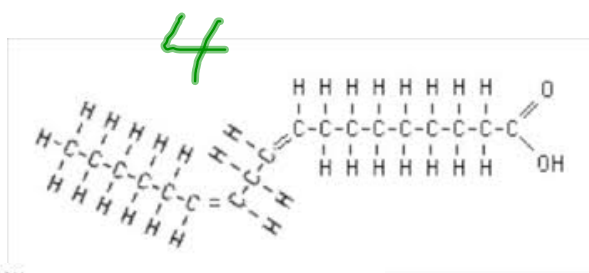
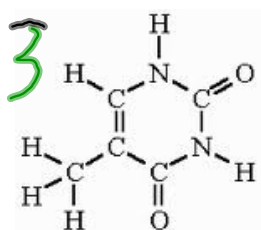
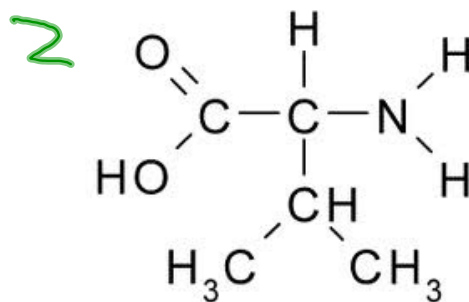
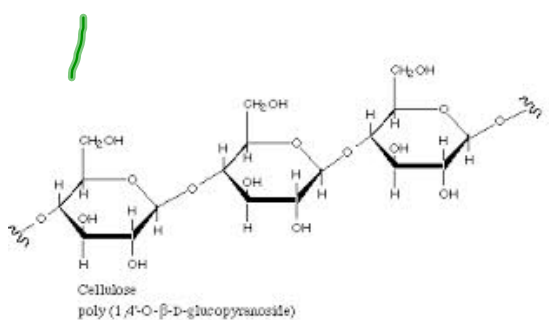
|

### Glucose



### Ribose





## Organic Molecule Roles

Carbohydrates: Sugars

energy, storage, — *short*  
structure

Lipids: Fats *longterm*

Storage, signaling  
(hormones), insulation

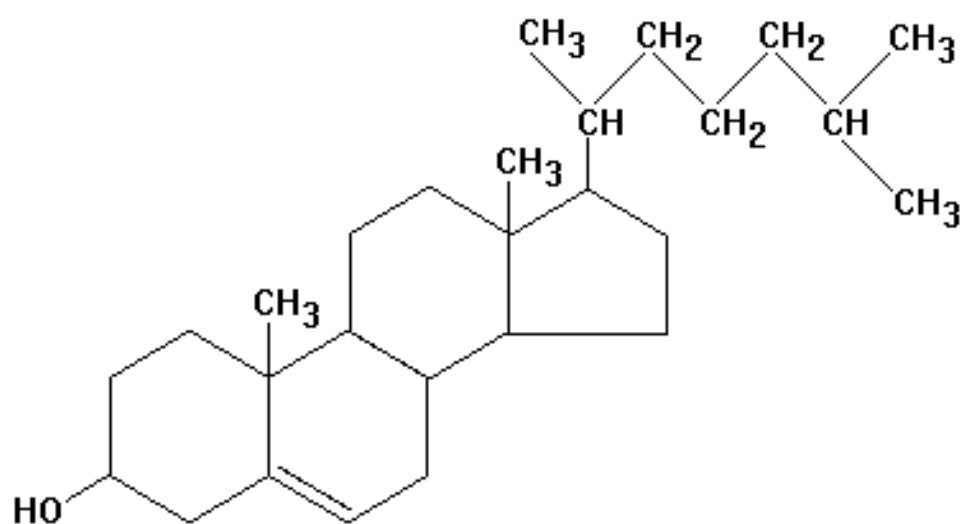
Nucleic Acids: stores  
information (DNA or  
RNA)

Protein: — *Polypeptide*

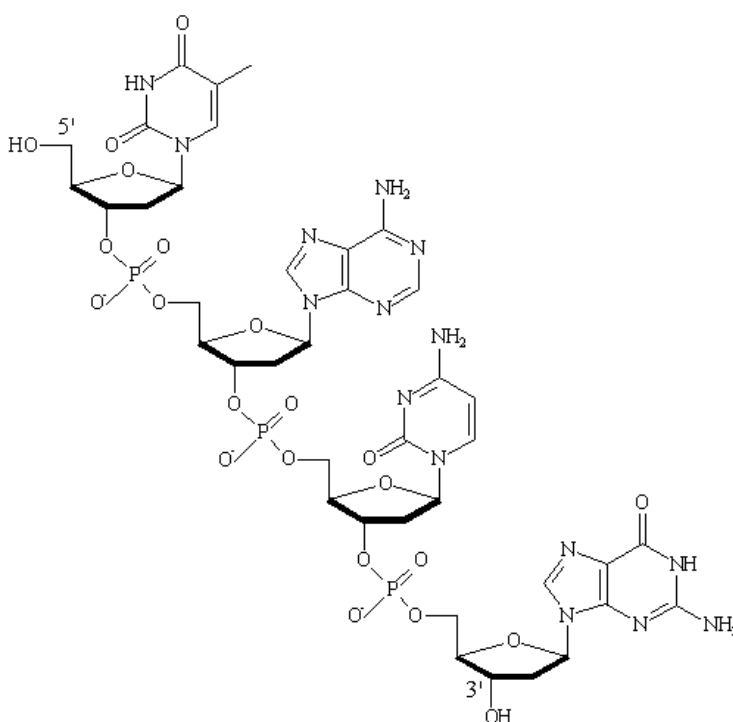
antibodies, movement, enzymes, storage

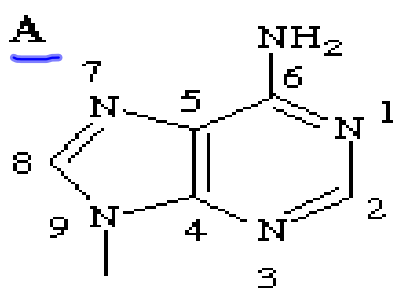
$$P + N = \text{mass}$$



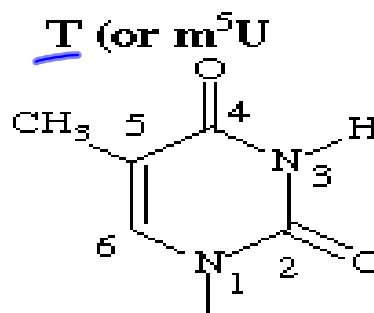
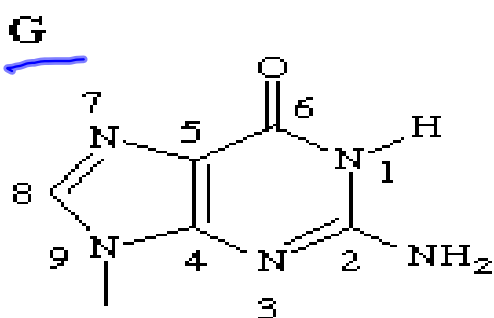
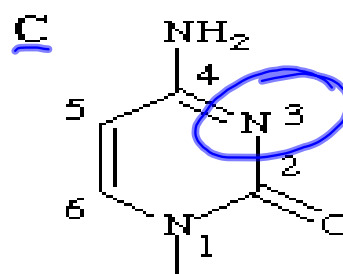


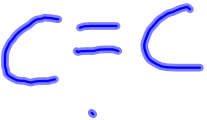
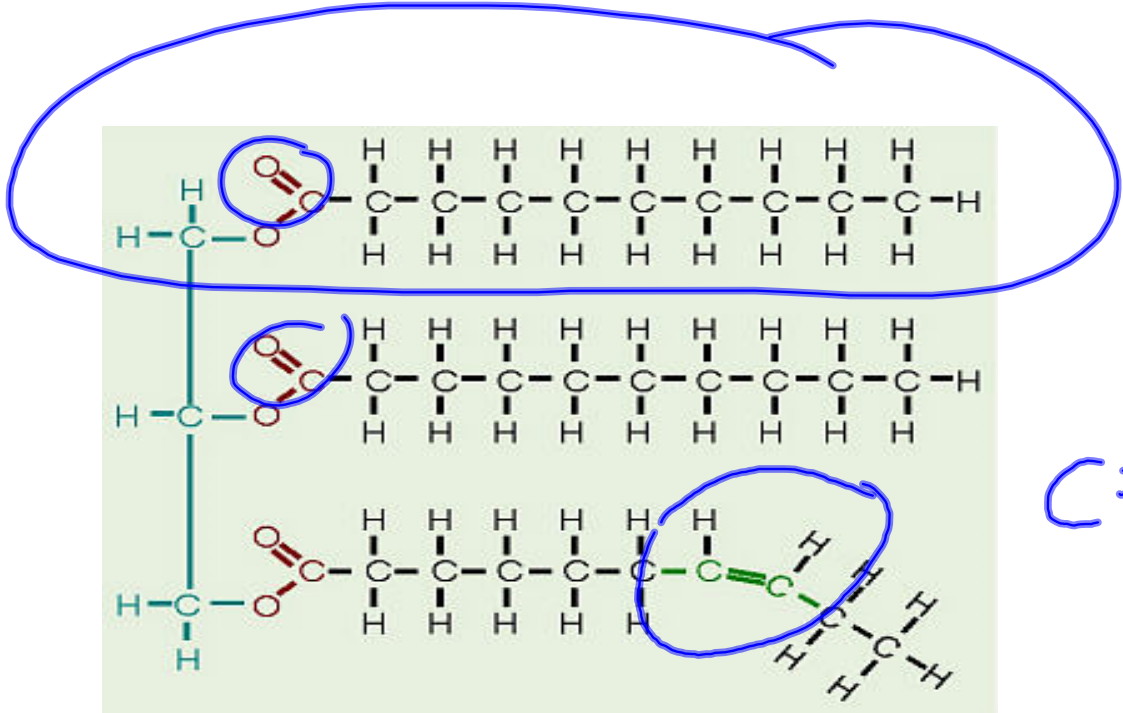


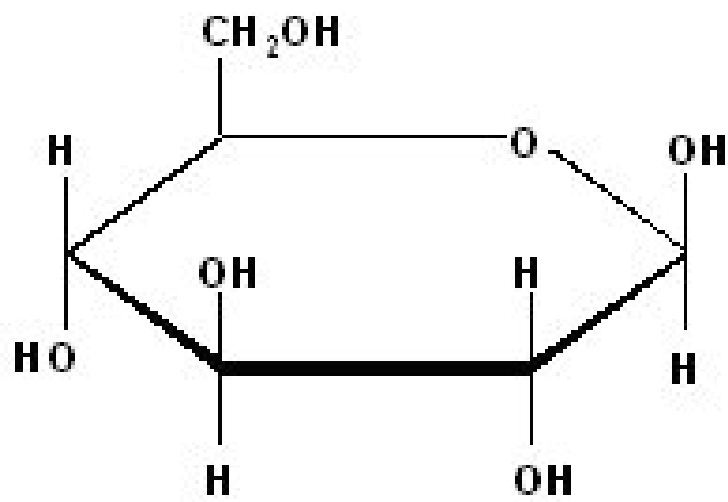


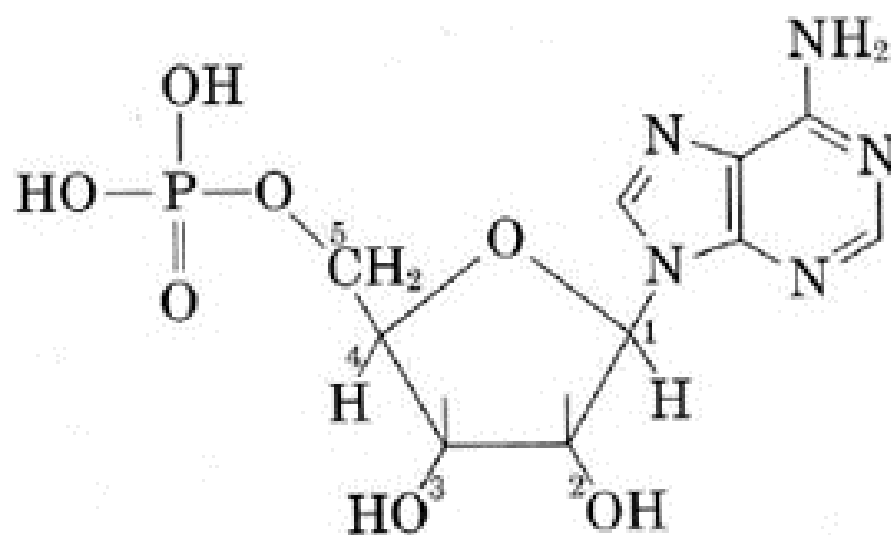


P

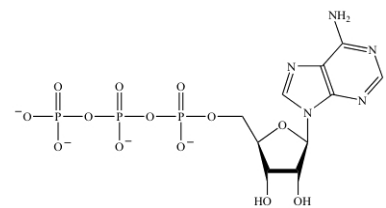
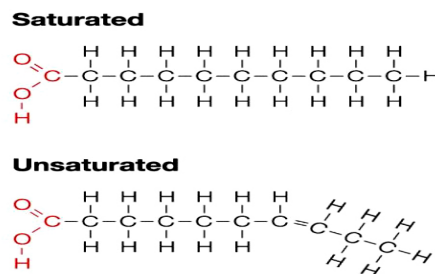
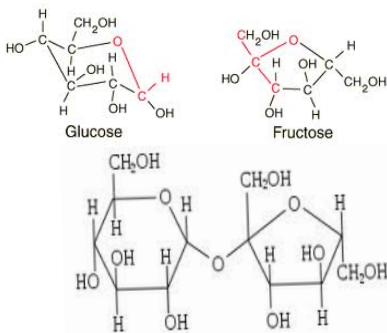




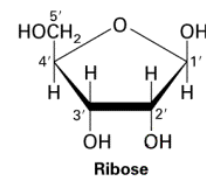
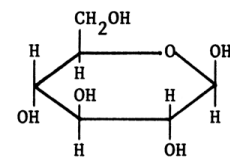
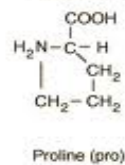
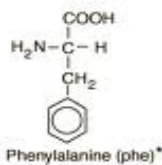
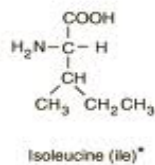
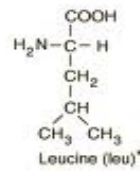
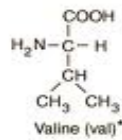
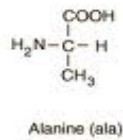
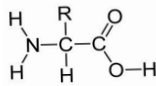


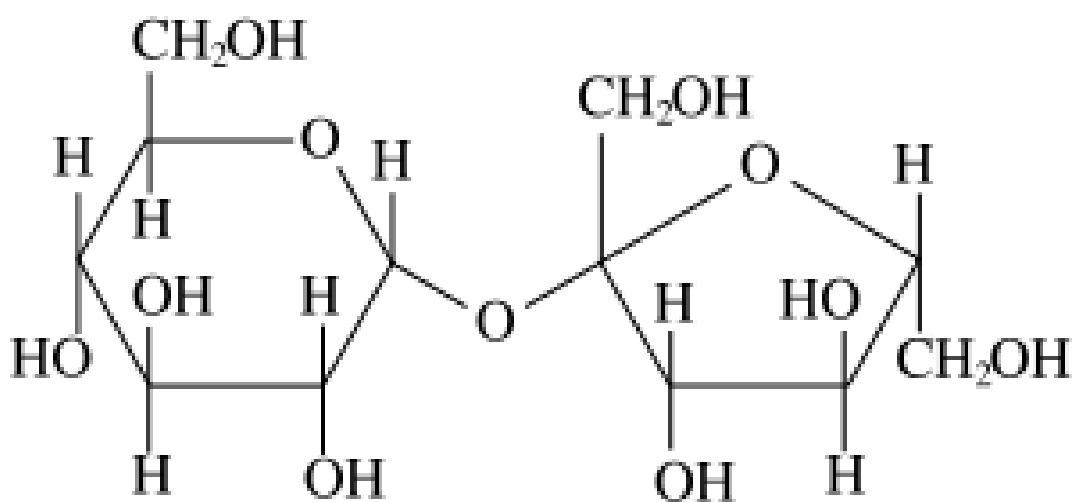


# Sugars 3.2.2 Lipids Nucleic Acids




## Amino Acids





Carbs / lipids  
C=O C, H, O lots of H

Nucleic Acids, Amino  
 N-C-C



H<sub>2</sub>O

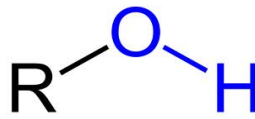
Sugar

X

X

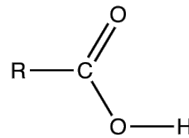
## Functional Groups

Hydroxyl Group: Alcohols

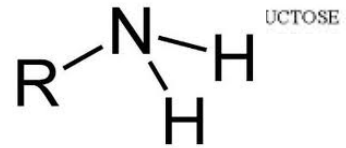


Carbonyl group: found in Sugar

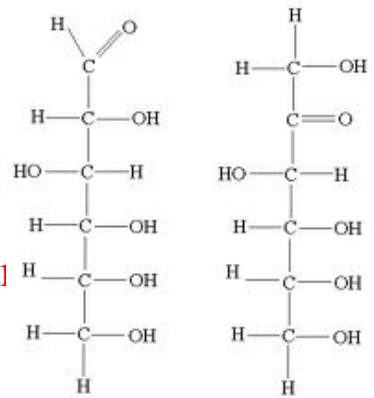
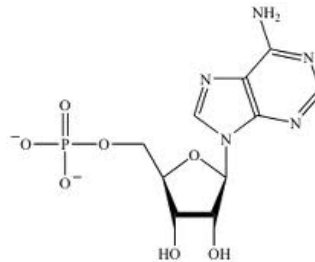
Carboxyl Group: Acids



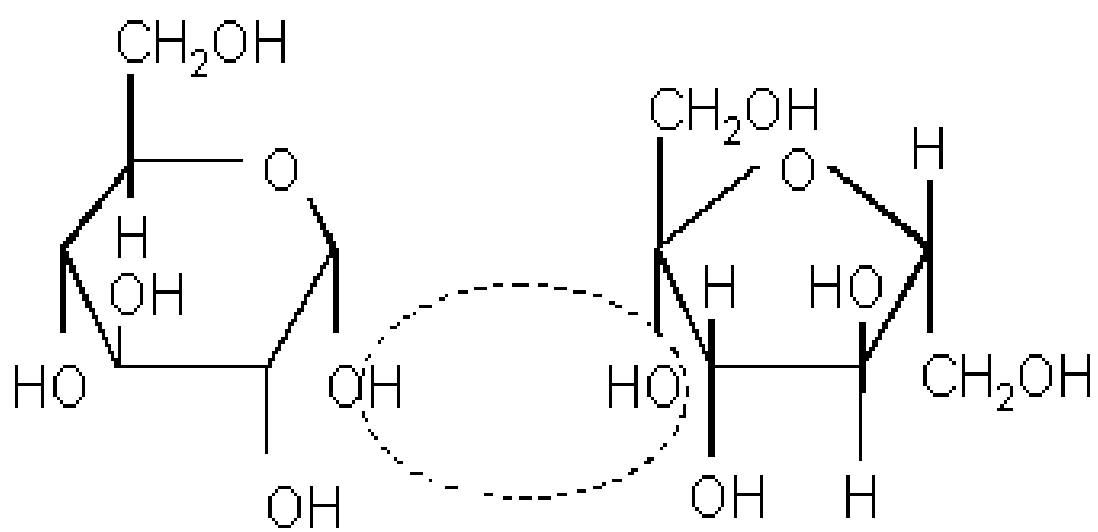
Amino Group: Amino acids, proteins



Phosphate Group: ATP

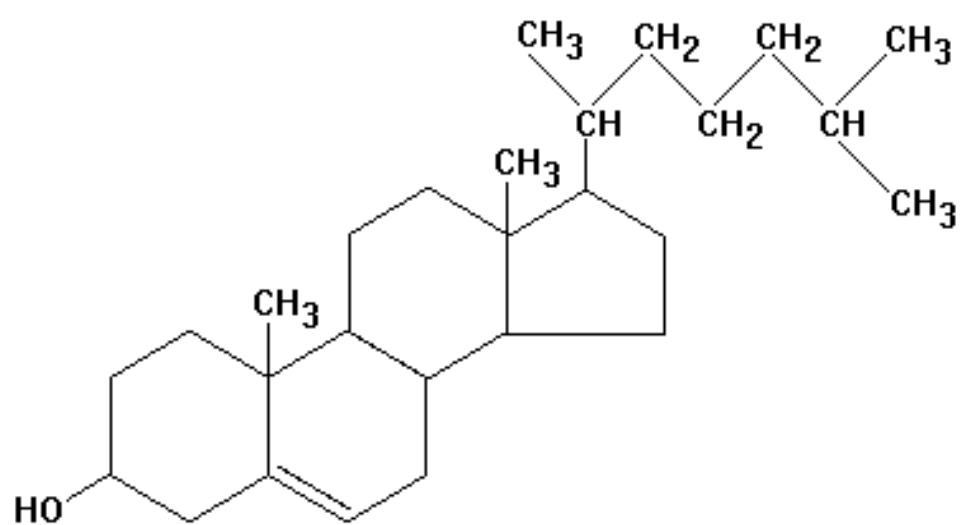


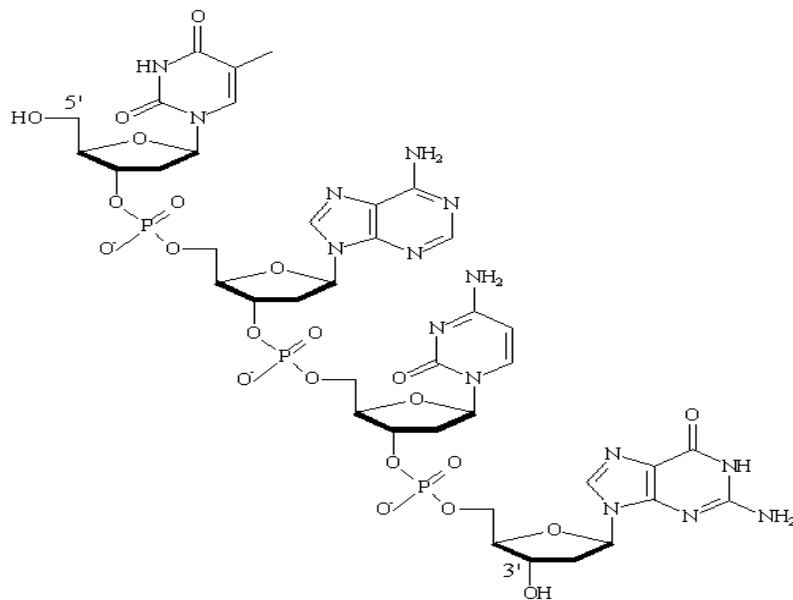
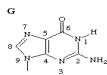
UCTOSE

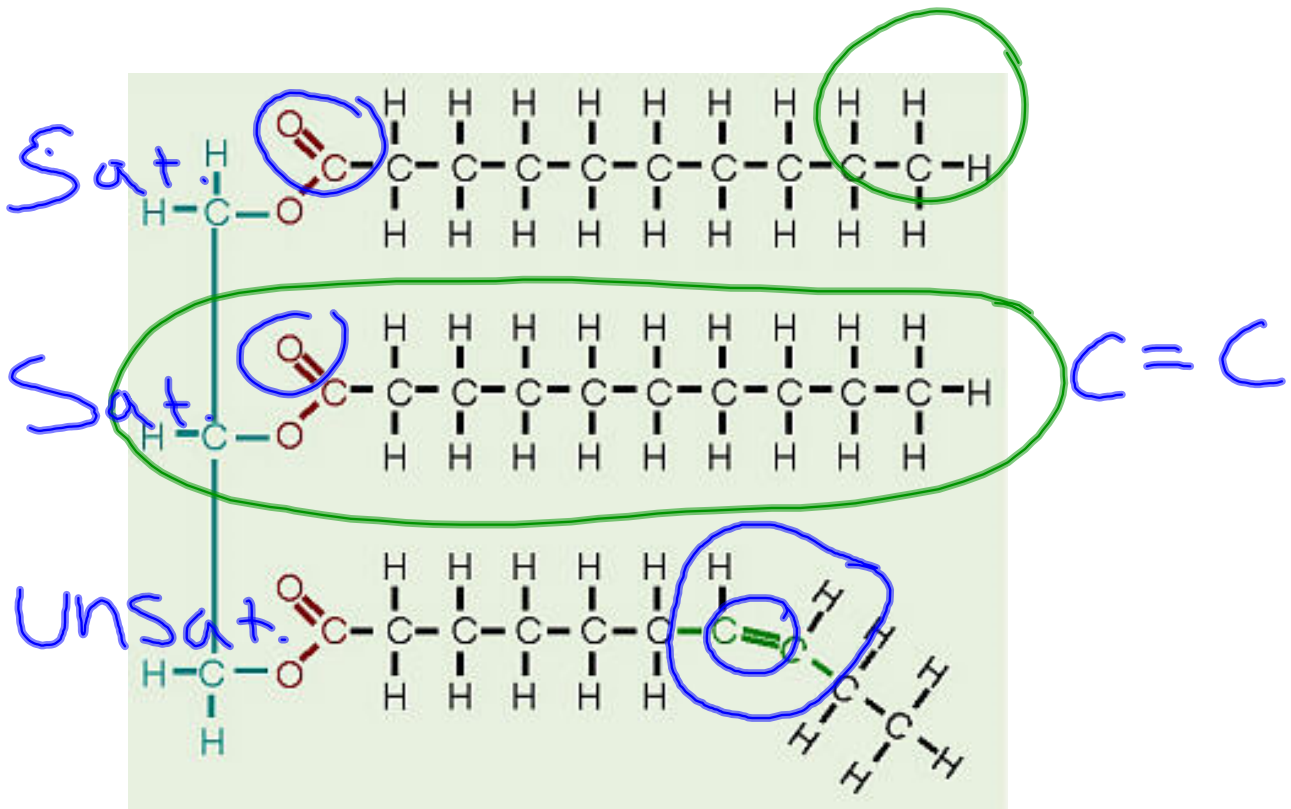


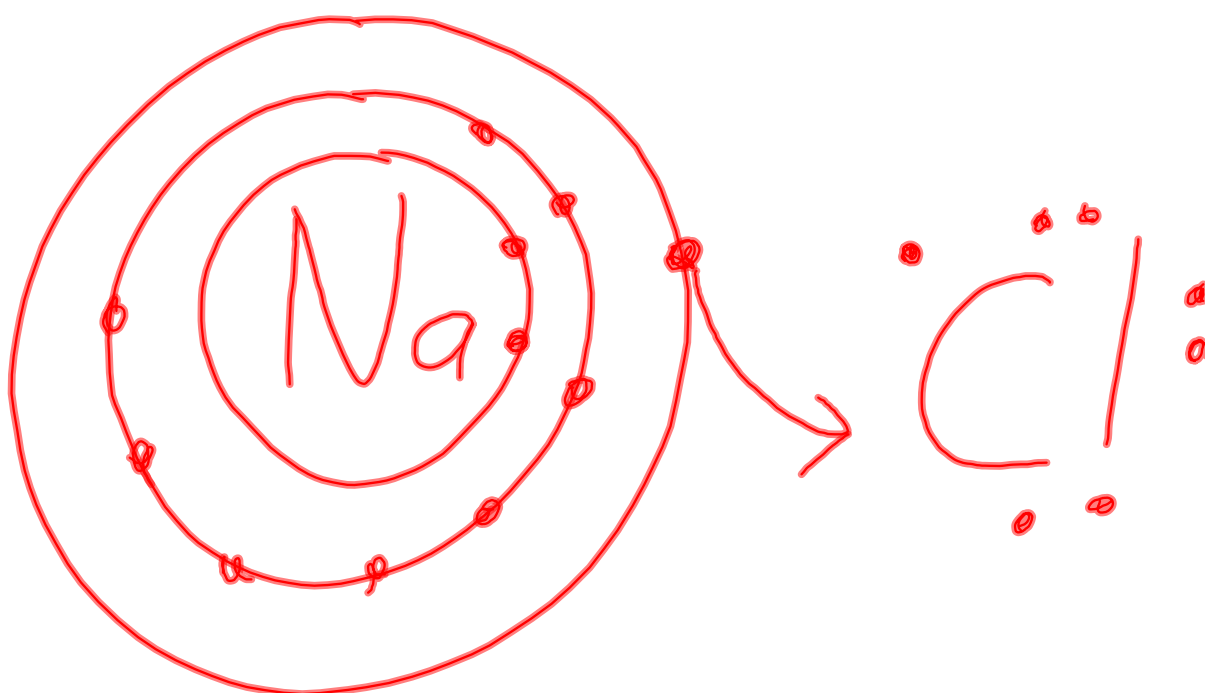
glucose

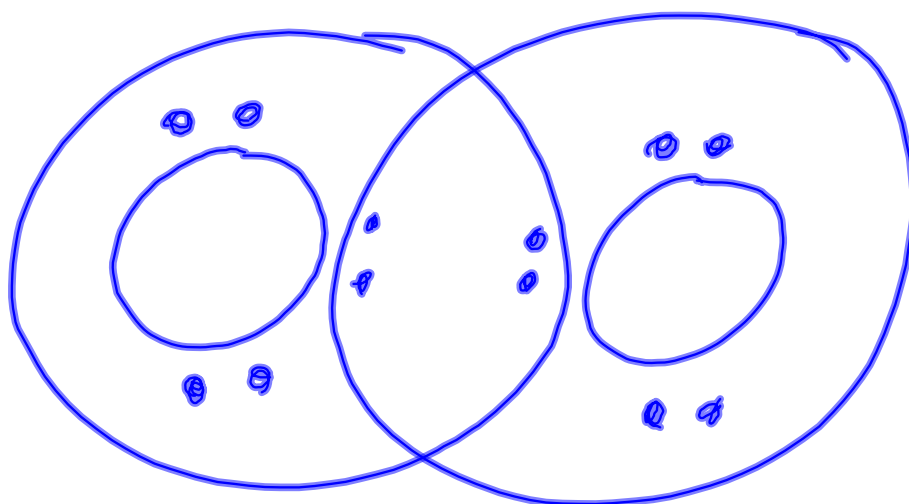
fructose



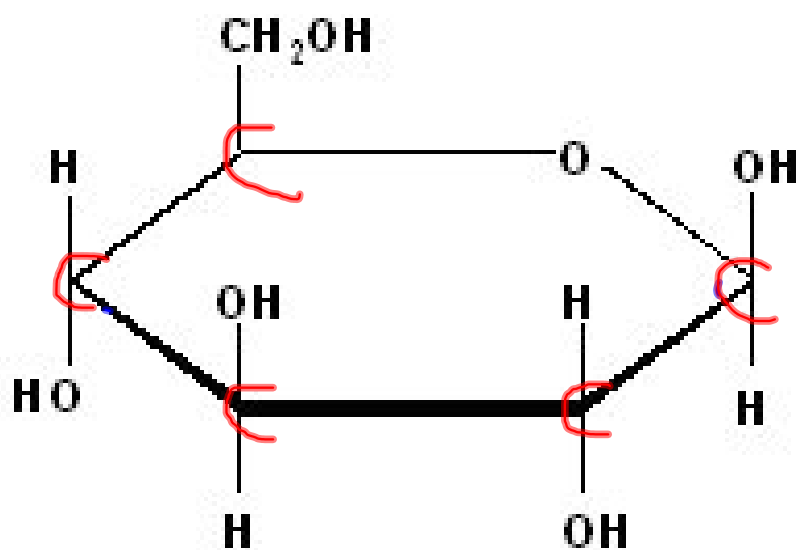


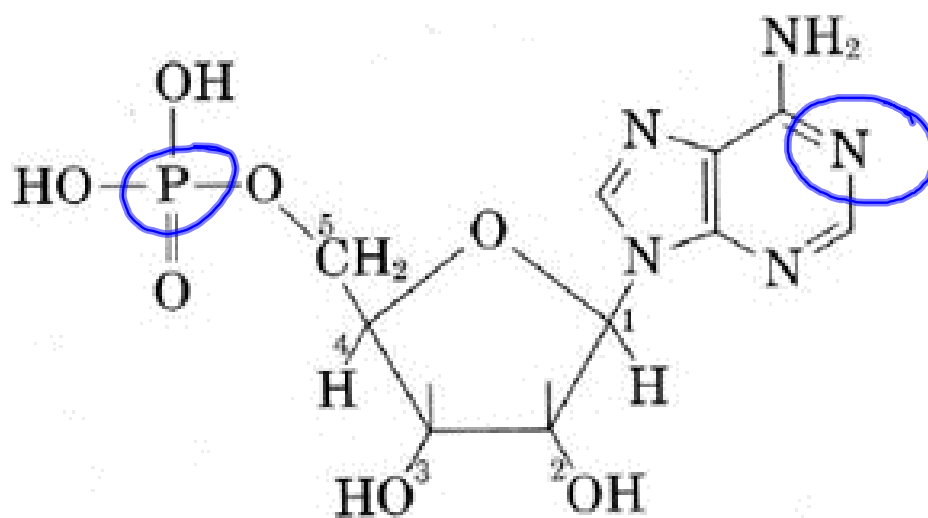




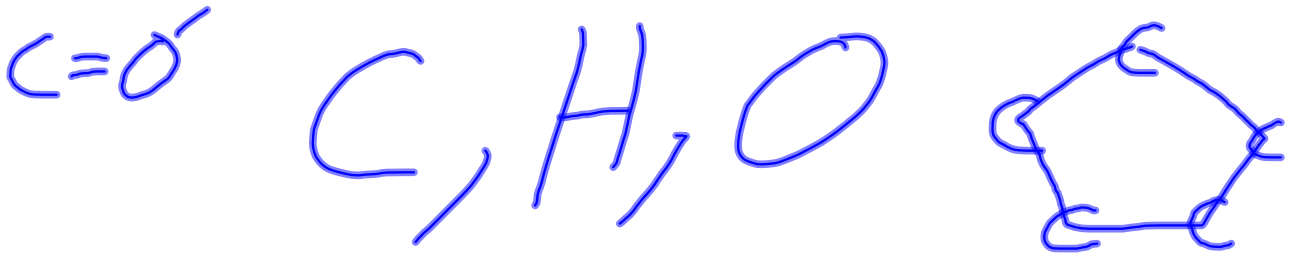








Carbs ? lipids



Nucleic, Aminos



