ORGANIC CHEMISTRY

→ ORGANIC MOLECULES CONTAIN C, H, N, O
AS WELL AS Fe, Na, K, Ca, Mg, Cl, I, S, P

→ MAY BE LARGE WITH MANY ATOMS

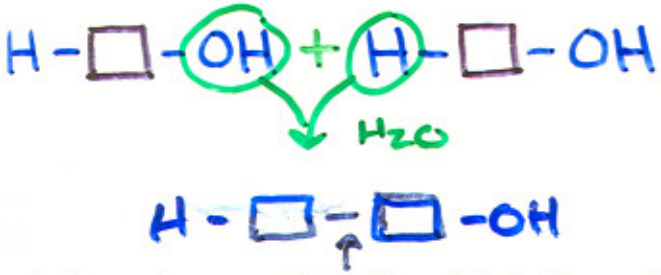
MONOMERS (BASIC UNIT) → MACROMOLECULES (POLYMERS)

□

eg
MONOSACCHARIDES	→	CARBOHYDRATE
AMINO ACIDS	→	PROTEIN
GLYCEROL + FATTY ACID	→	LIPID
NUCLEOTIDES	→	NUCLEIC ACIDS

HOW?

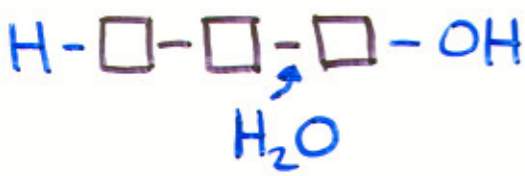
1. DEHYDRATION SYNTHESIS



H = HYDROGEN
OH = HYDROXYL
□ = MONOMER

MONOMERS JOIN, H_2O RELEASED

2. HYDROLYSIS



BOND BROKEN BY H_2O, RELEASING A MONOMER

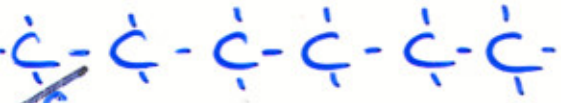
A. CARBOHYDRATES

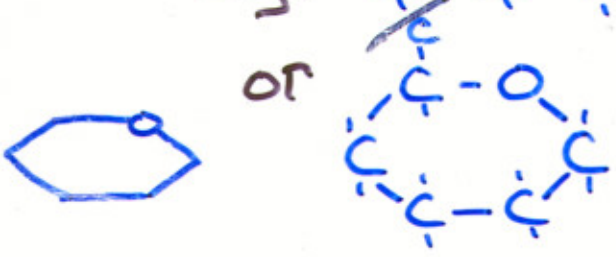
1. STRUCTURE:

$C_6H_{12}O_6$

CHEM. FORM. (EMPIRICAL) $(CH_2O)_n$ $n > 3 \rightarrow 7$ (HYDRATE OF CARBON) H_2O

C FORMS BACKBONE

eg.  LINEAR CHAIN

or  RING STRUCTURAL FORMULA

2. FUNCTION:

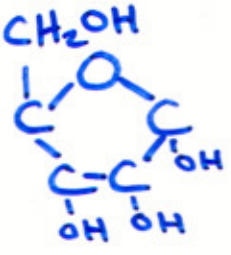
TO PROVIDE SHORT TERM ENERGY (#1) AND LARGER MOLECS. FOR STRUCTURAL SUPPORT

3. TYPES:

i. MONOSACCHARIDES (MONOMERS)

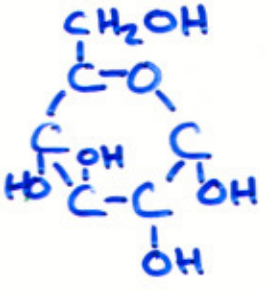
- SIMPLE SUGARS

PENTOSE 5C eg RIBOSE



~~P. 32 fig 2.19~~

HEXOSE 6C eg GLUCOSE* $C_6H_{12}O_6$

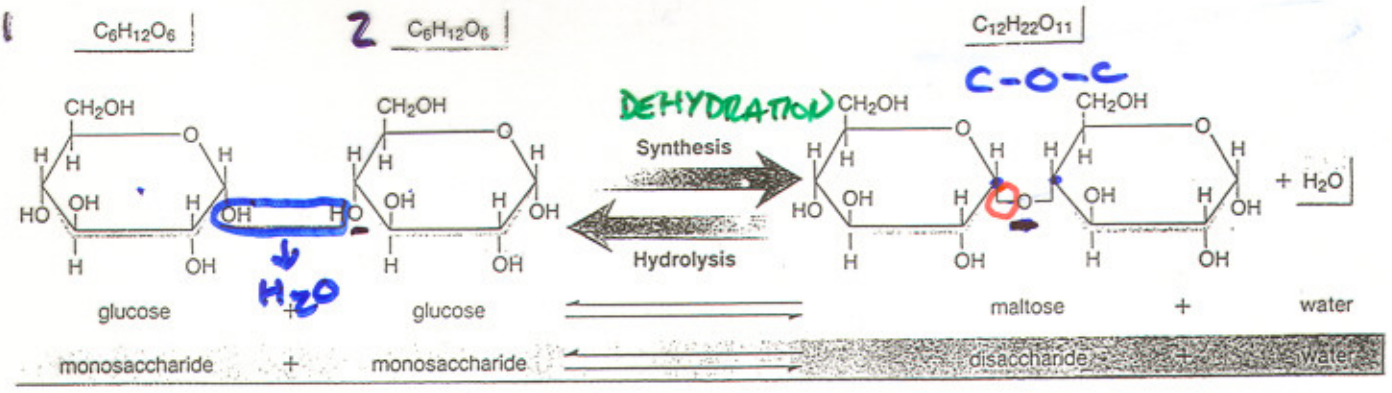


ALSO FRUCTOSE, GALACTOSE

ii. DISACCHARIDES

WHEN 2 MONOSAC. COMBINE VIA DEHYDRATION SYNTHESIS SEE H.O. fig. 2.20

2.18



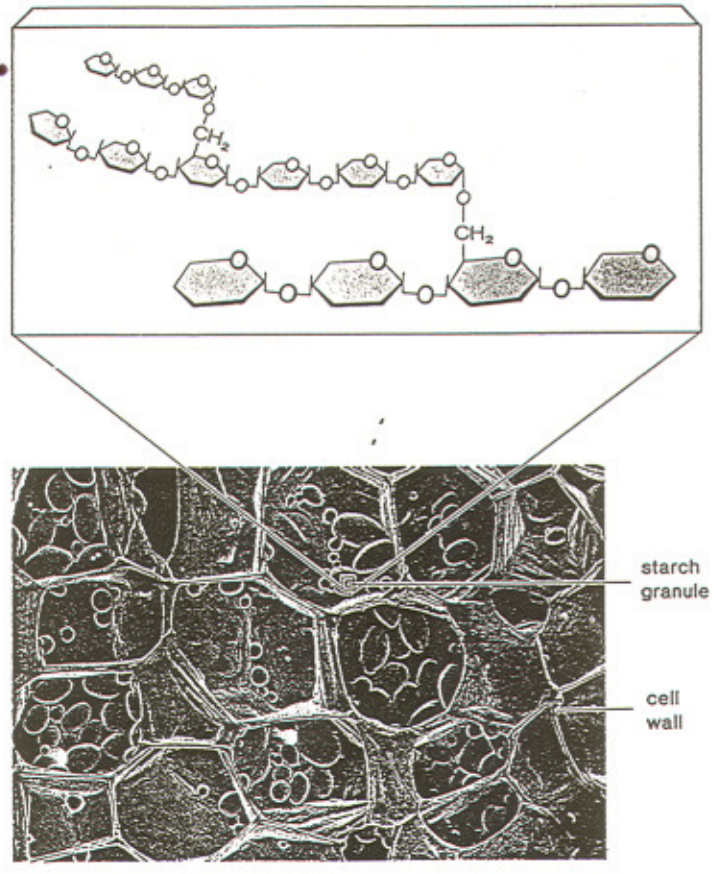
Disaccharide Formation
Figure 2.20

GLUCOSE + FRUCTOSE ⇌ SUCROSE + H_2O

iii. POLYSACCHARIDES

MANY MONOSAC.
- CHAINS OF GLUCOSE

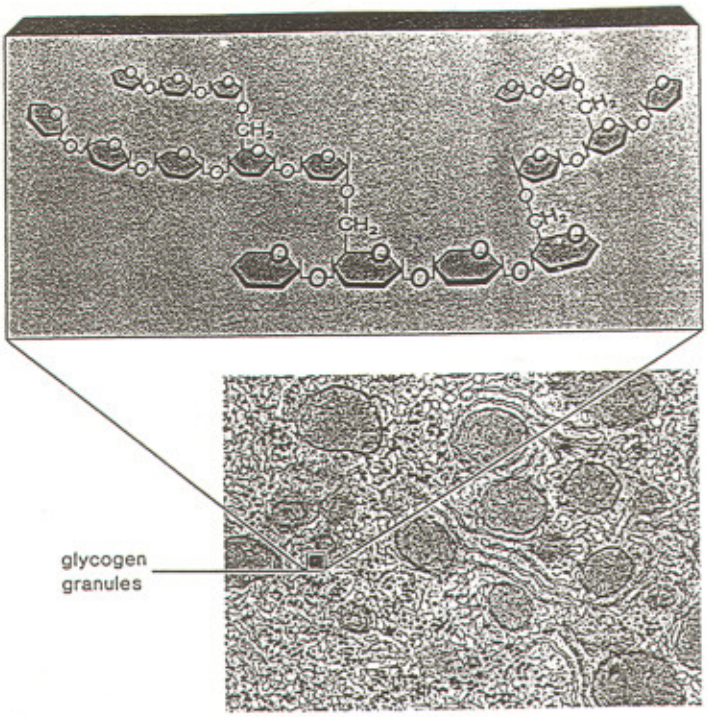
a.



a. STARCH
- STORAGE OF GLUCOSE IN PLANTS
- FEW SIDE CHAINS OR BRANCHES

Starch Structure and Function
Figure 2.21

b.

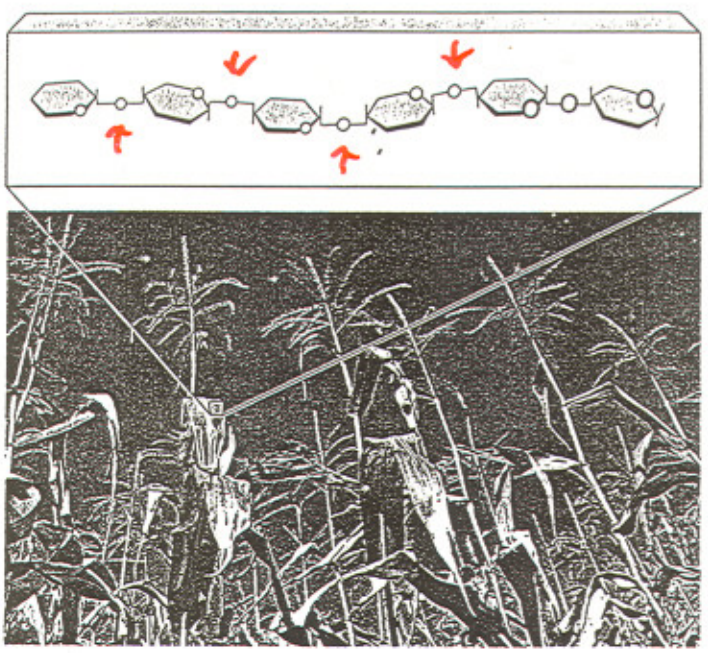


Glycogen Structure and Function
Figure 2.22

b. GLYCOGEN
- STORAGE OF GLUCOSE IN ANIMALS
- MANY SIDE CHAINS
- STORED IN LIVER + MUSCLE

c.

ENZ. CAN'T BIND



c. CELLULOSE
- SUPPORT FOR PLANT CELL WALLS
* - UNDIGESTIBLE BY US DUE TO ALTERNATING O LINK BTWN. MONOMERS