

Carbohydrates



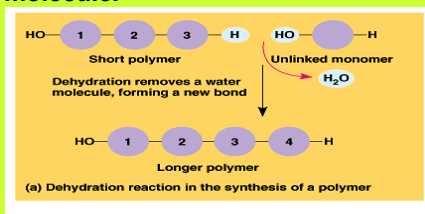
Macromolecules

- macromolecules are made by joining small molecules together called monomers to make polymers



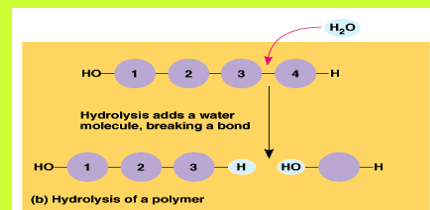
Dehydration Synthesis

- How monomers are connected by reactions involves the loss of a water molecule.



Hydrolysis

- polymers are broken apart by reactions which involves the addition of a water molecules.



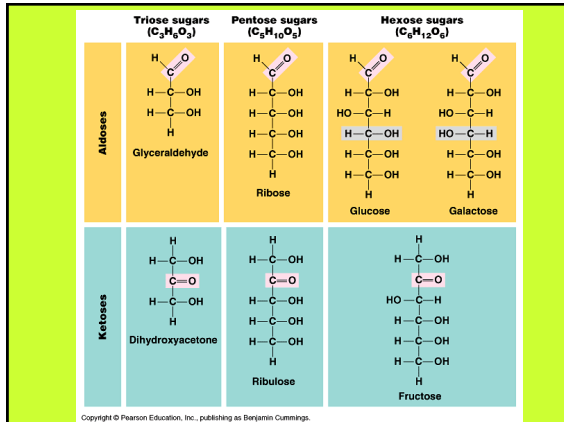
CFU

- If water is being taken out are you building or breaking down a molecule?
- If water is being added in- are you building or breaking down a molecule?
- How many water molecules would be lost from a polymer made up of 5 monomers?
- How many water molecules would be added in to break apart a polymer that is 10 monomers long?

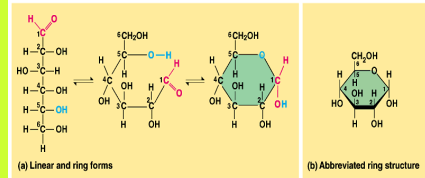
Monosaccharides

- Monomer of carbohydrates
- usually have CH_2O ratio
- called simple sugars
- sugars end with -ose (ex. Glucose, fructose etc.)
- Used to make usable energy for organisms called ATP





- can be linear or cyclic (ring structure) but in aqueous solutions are typically cyclic



Ex.

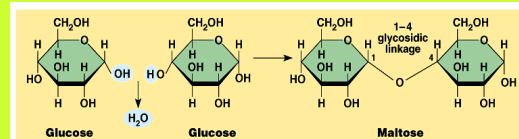
- galactose- found in milk but is often called brains sugars because is used to make glycoproteins found in nervous tissue.
- Ribose & Deoxyribose- found in nucleic acid

CFU

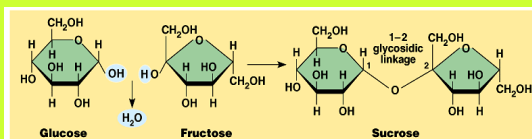
- Which three elements are all carbs made up of?
- How can you tell $C_{32}H_{65}O_2$ is not a carbohydrate?
- What do all sugars end in?
- What is the monomer of carbohydrates?

Disaccharides

- two simple sugars joined with a covalent bond between the $-OH$ of one sugar and the $-OH$ of another sugar, leaving an O between the two.

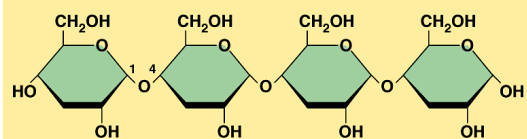


- Ex.
- maltose(2 glucoses)- found in beer & germinating seeds
- lactose(glucose/galactose)- found in mammals milk
- sucrose(glucose/fructose)- table sugar, found in honey, fruits and vegetables



Polysaccharides

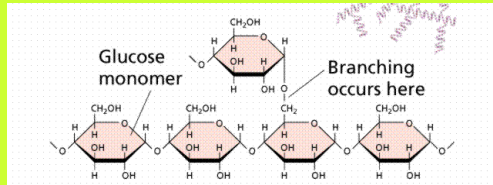
- can be used to store energy
- Starch**
- many glucoses joined together
 - stored in plastids of plants only



(b) Starch: 1-4 linkage of α glucose monomers

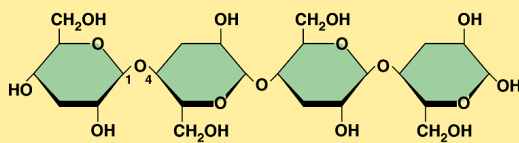
Glycogen

- many glucoses joined together but with branching
- found in animals (stored in our liver or muscles)
- hydrolyzed when energy is needed



Cellulose

- most abundant organic compound on earth
- Different bond than in starch
- very strong (think wood)
- cannot be digested by animals (stimulate the digestive tract to make mucus for passage of waste)
- some animals have symbionts that help digest cellulose (ex. Termites and cows).



(c) Cellulose: 1-4 linkage of β glucose monomers

- What are two important polysaccharides found in plants?
- What is an important polysaccharide found in animals?
- How do cellulose and starch differ?