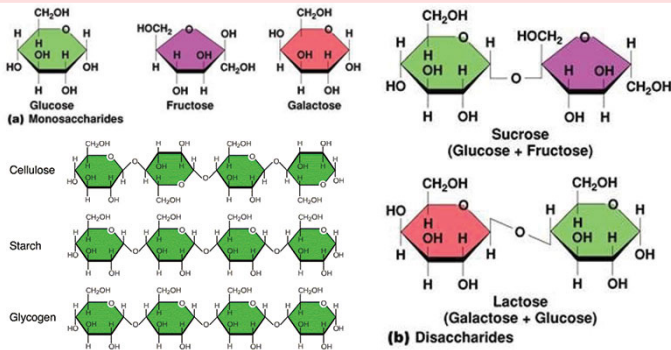
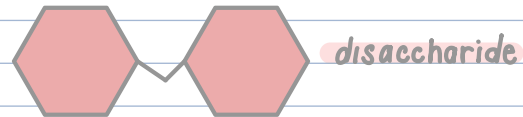


# carbohydrates



carbohydrates include sugars and polymers of sugars. these molecules are used as building materials and sources of energy. single sugar molecules, called monosaccharides, and linked pairs of sugars, called disaccharides, are important as building blocks & cellular fuels.

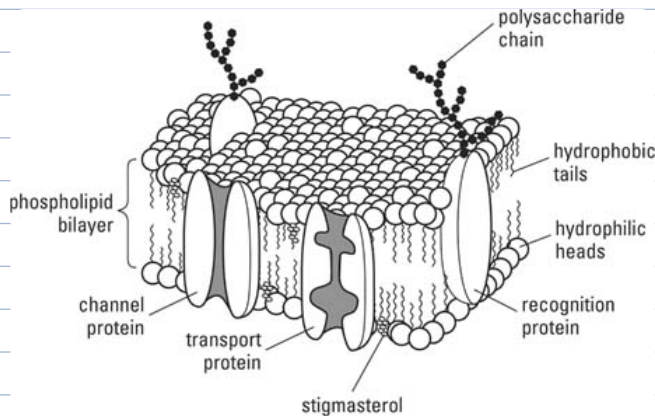


polysaccharides are long chains of sugars. a polysaccharide called cellulose is a major component of plant cell walls. plant cells store sugars in the form of a polysaccharide called starch. animals store a polysaccharide called glycogen. polysaccharides on cell membranes act as cell identification tags.

simple sugars (monosaccharides) are the simplest carbohydrates. monosaccharides vary in size; their carbon skeletons range from 3-7 carbon atoms. they generally have a molecular formula that is some multiple of  $CH_2O$ . ( $C_nH_{2n}O_n$ )

[for example:]

- glyceraldehyde :  $C_3H_6O_3$
- ribose :  $C_5H_{12}O_5$
- glucose :  $C_6H_{12}O_6$
- galactose :  $C_6H_{12}O_6$
- fructose :  $C_6H_{12}O_6$



monosaccharides are often drawn with linear carbon skeletons, but in water all monosaccharides that contain more than 3 carbon atoms bend around in order to make ring structures. The monosaccharide glucose is a major nutrient, central to cellular metabolism. it is broken down for energy in the process of cellular respiration. The carbon skeleton of glucose can also be used to build many other organic molecules, including amino acids & fatty acids.

glyceraldehyde is the monosaccharide that is the energy-storing molecule produced by photosynthesis. 2 glyceraldehyde molecules combine. (the monosaccharide galactose combines w/ glucose to form the disaccharide in milk)

fructose is the monosaccharide that is sometimes called "fruit sugar", the one that makes apples and berries sweet. fructose & glucose combine to make the disaccharide sucrose or table sugar.

# • QUICK NOTES •

- ◻ animals store energy in the form of glycogen
- ◻ glucose + glucose  $\rightarrow$  maltose + water  
by dehydration synthesis  
(maltose is the disaccharide formed when 2 glucose molecules are linked by dehydration synthesis)
- ◻ cellulose is a carbohydrate composed of many monomers
- ◻ cellulose, a component of plant cell walls, is the most abundant organic compound on earth.