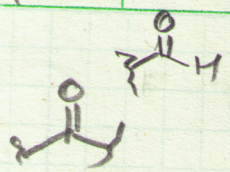
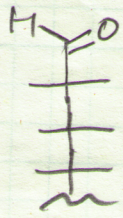
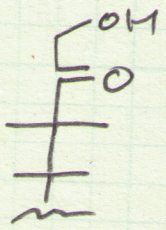
"Aldehydes"
"Ketones"



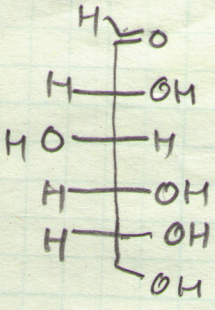
Aldoses



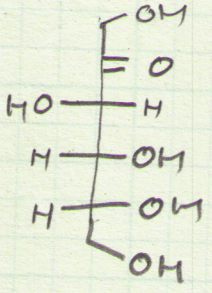
Ketoses



Glucose (aldose)

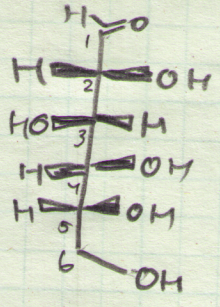


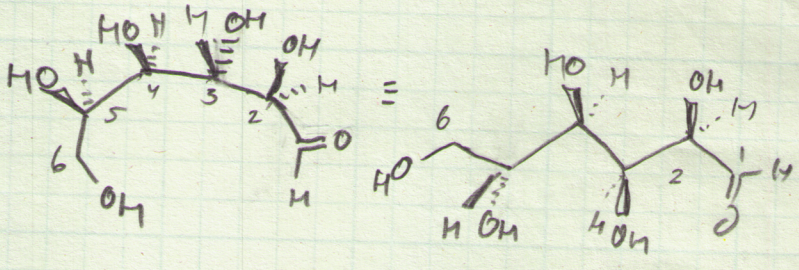
Fructose (ketose)



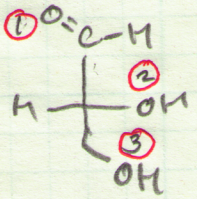
Conformations of Sugars + Cyclic Hemiacetal Forms

Glucose





Fischer Projections of sugars: Revisited



Three "tri" O's } in the 'triose' sugar Family

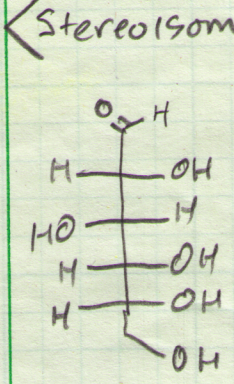
more specifically it is in the **aldotriose family**

See previous pages of Ch 24 for structures

Sugar: Glucose — Family: aldohexose (6-O's) → aldolase

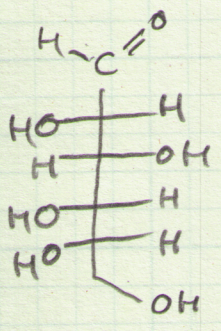
Fructose — ketohexose (6-O's) → ketose

only 1!



D-Glucose

mirror image

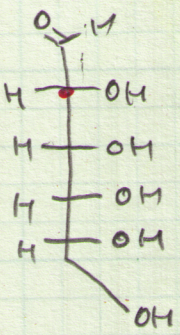


Enantiomer

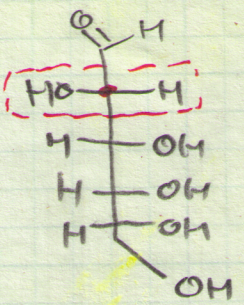
L-Glucose

<stereoisomerism>

Epimer: 1 stereocenter is switched



D-allose



D-Altrose (an epimer of D-Allose)

what is the stereoisomeric relationship between D-Allose and D-Glucose

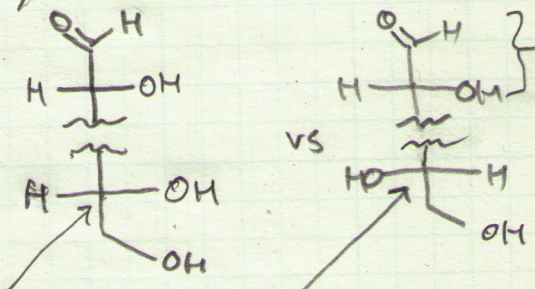
DICEN? ☐

Also, is D-allose an epimer of glucose? ☐

Stereoisomerism

D/L is based on the stereoconfiguration of the highest numbered stereo center of the sugar

more oxidized C at TOP



highest # OH is at the R

D-sugar

↳ dextro : Latin - Right

Regardless of the stereoconfiguration at the lower #'d carbon centers

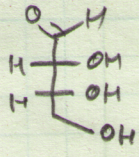
HO is to the Left (levo - Latin: laevus ⇒ left)

L-sugar

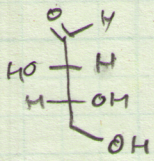
Rotating the Plane-of-Polarized Light (POPL)*

Chiral molecules rotate a plane of polarized light but note that designating a sugar as 'D' or 'L' DOES NOT predict (or tell) which way the sugar will rotate a plane of polarized light.

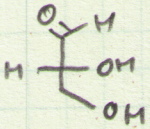
For example it would seem there is predictive character based on



D-Erythrose (-)



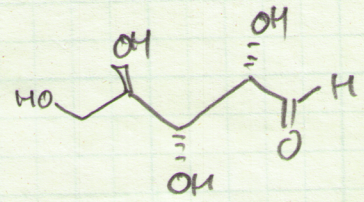
D-Threose (-)



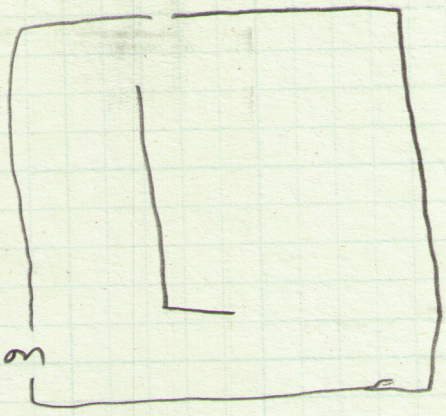
D-Glyceraldehyde (+)

* POPL

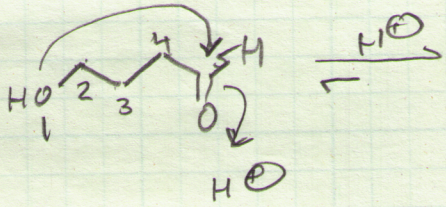
Redraw



As a Fischer Projection using the template.



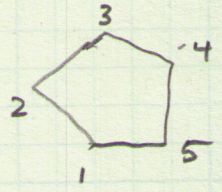
Cyclization (Intramolecular)



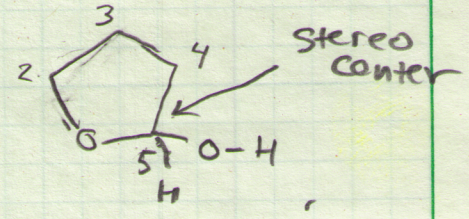
① what cyclic template needs to be drawn

② Arbitrarily count atoms contained within the ring using the structure at the right.

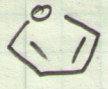
③ I count 5 atoms; draw a pentagon and number it 1→5



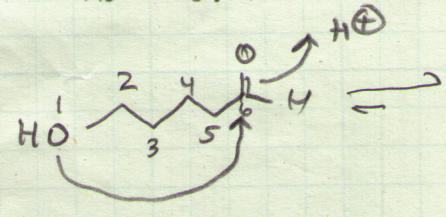
1 is 'O'

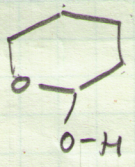


Furanose ring

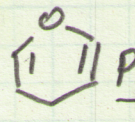
base on  furan

Similar for 6-membered ring





Pyranose ring

from  Pyran

Mechanism! Recall