CONCEPT: ANOMER

Monosaccharide Cyclization Generates α and β Anomers

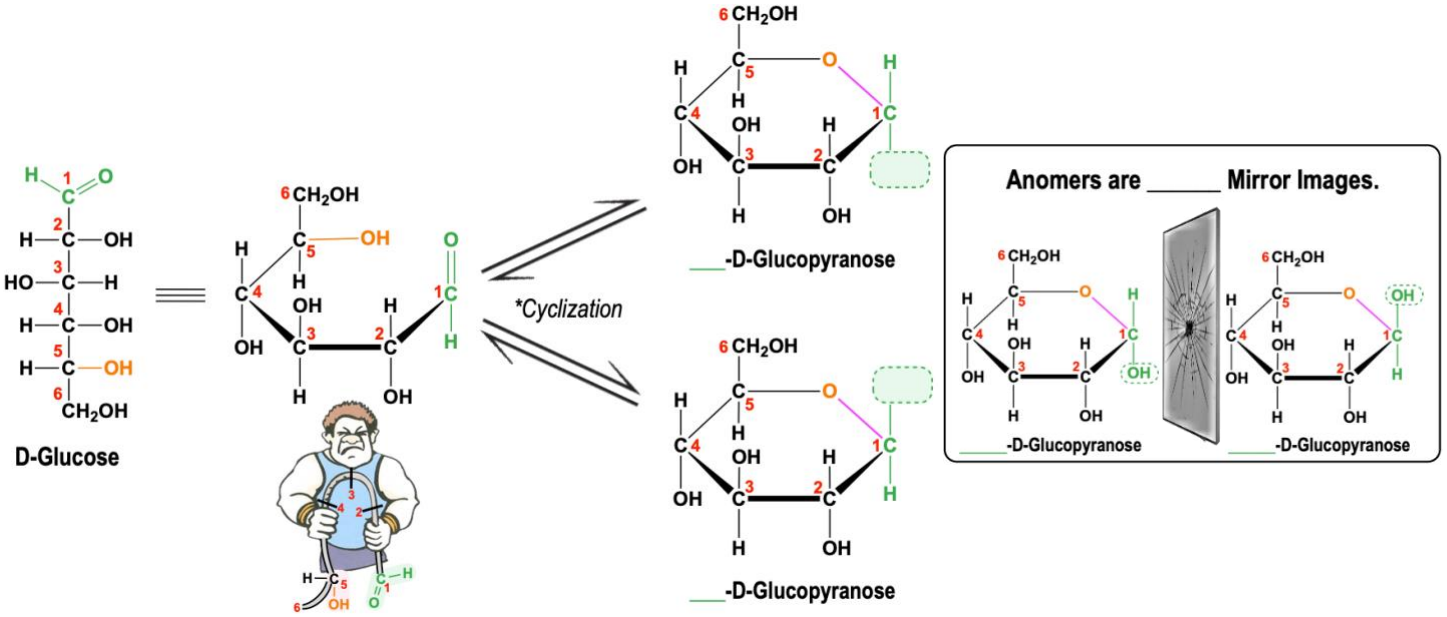
●_____: cyclic sugars that differ ONLY in configurations of their _____ *carbon*.

□ *Anomeric carbon*: only ring carbon attached to ____ *oxygens* (*used to be* carbonyl carbon *before* cyclization).

●When a monosaccharide cyclizes, the *anomeric carbon* becomes a *chirality center* with _____ possible configurations:

1) ____ *Anomer*: anomeric carbon's -OH is on the *opposite* side of its *highest numbered carbon*.

2) ____ *Anomer*: anomeric carbon's -OH is on the _____ side of its *highest numbered carbon*.



EXAMPLE: Which of the following molecules are anomers?

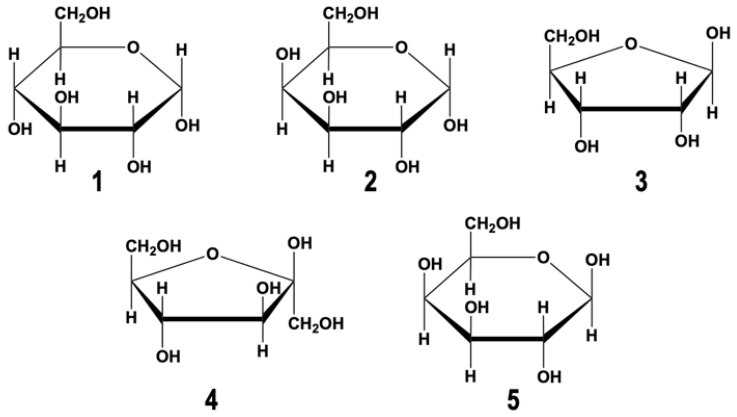
a) Molecules 1 and 2.

b) Molecules 2 and 5.

c) Molecules 1 and 5.

d) Molecules 3 and 4.

e) Molecules 1 and 4.



PRACTICE: The ___/___ configuration of a monosaccharide is determined by the _____ of the chiral carbon furthest from the carbonyl group, while the ___/___ anomers are determined by _____ of the anomeric carbon.

a) D ; L ; conformations ; R ; S ; configuration.

b) R ; S ; conformation ; α ; β ; configuration.

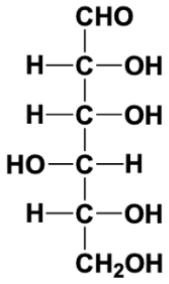
c) D ; L ; configuration ; α ; β ; conformation.

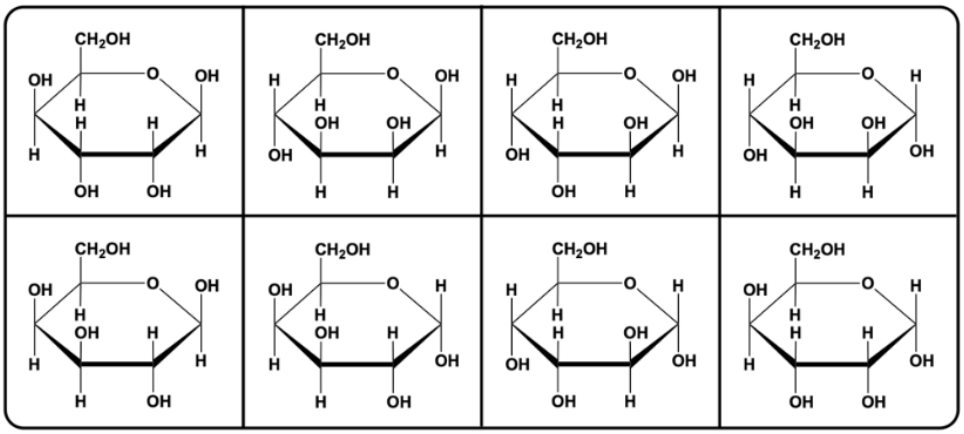
d) D ; L ; configuration ; α ; β ; configuration.

e) D ; L ; conformation ; α ; β ; conformation.

CONCEPT: ANOMER

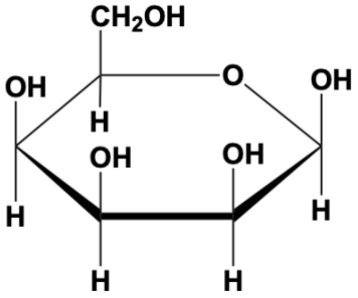
PRACTICE: Circle the α and β anomers for the following D-monosaccharide:





PRACTICE: Answer the following questions regarding the following cyclic monosaccharide shown below:

A) Clearly label the hemiacetal carbon.



B) The monosaccharide is a(n) _____ anomer.

a) Alpha (α).

b) Beta (β).

C) Draw the opposite anomer.

D) Draw the α stereoisomer that differs in the arrangement of substituents at C2.