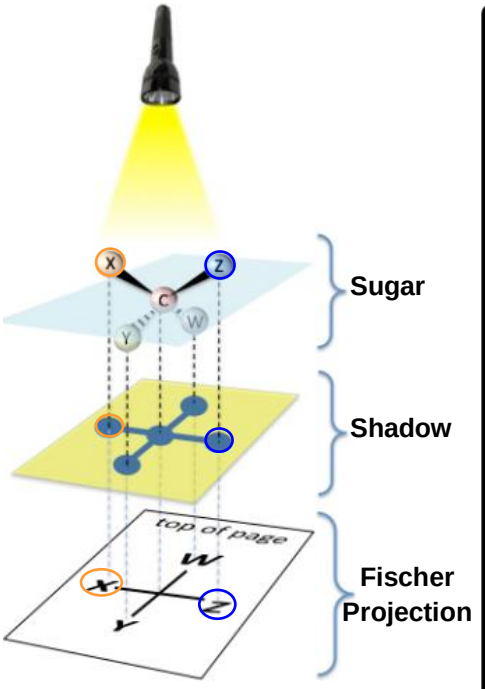
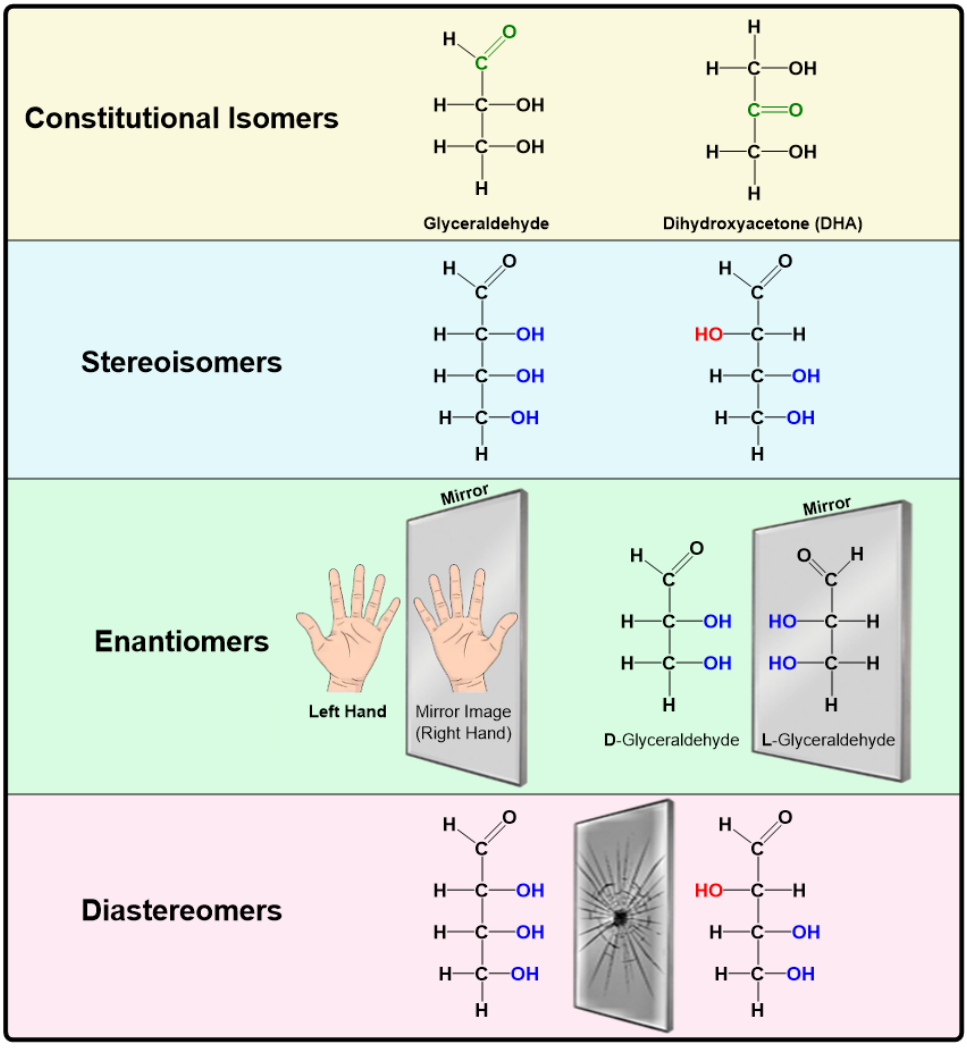
CONCEPT: STEREOCHEMISTRY OF MONOSACCHARIDES

●Recall: WAY back in previous videos, we did Organic Chemistry review. Be sure to check those out before moving on!

●To represent 3D structures on paper, *linear* monosaccharides are commonly displayed using _____ Projections.





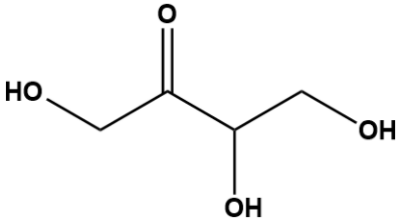
Calculating # of Stereoisomers

●# of Stereoisomers a molecule has = _____ (where ____ = # of *chiral carbons*).

□ Recall: *Chiral Carbon*: a carbon atom covalently bound to _____ *distinct* chemical groups.

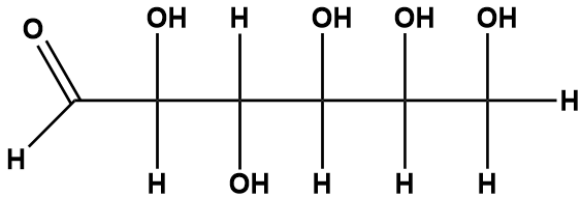
EXAMPLE: Circle all of the chiral centers and determine how many stereoisomers each of the following molecules have.

A)



# of Stereoisomers: _____

B)

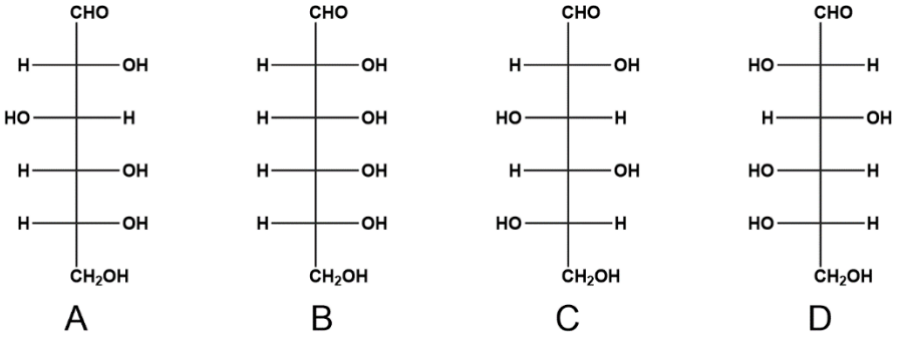


# of Stereoisomers: _____

CONCEPT: STEREOCHEMISTRY OF MONOSACCHARIDES

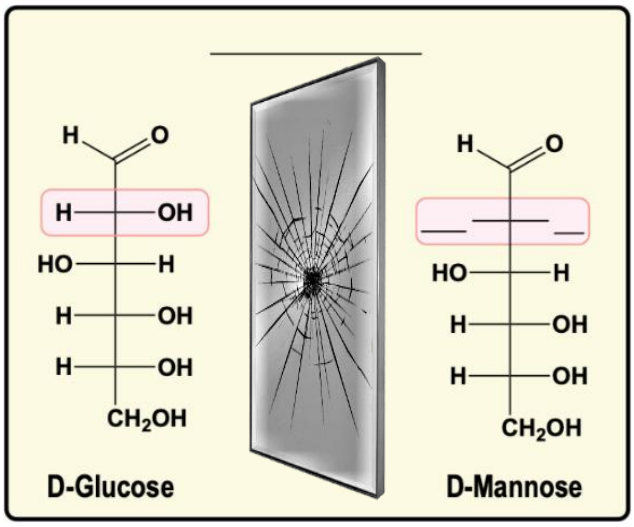
PRACTICE: Which sugar is an enantiomer of sugar A? How many stereoisomers does sugar A have? _____

a) None of them.
b) Sugar B only.
c) Sugar C only.
d) Sugar D only.
e) Both Sugars B and D.



Monosaccharide Epimers

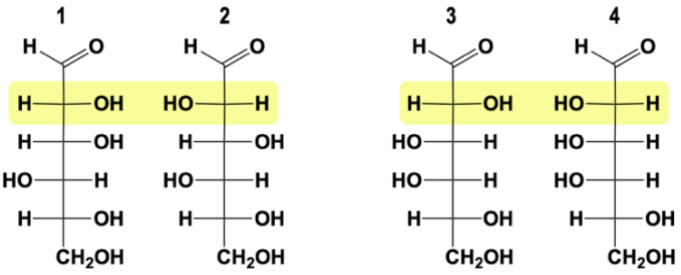
●_____: *diastereomers* that differ ONLY in configuration of *any* one-single chiral carbon.



PRACTICE: Use the Fischer projections of the four monosaccharides below to answer the next two problems (A & B).

A) The term that best describes the relationship of all four sugars to each other is:

a) Diastereomers. b) Enantiomers. c) Epimers.



B) Sugars 2 and 4 are:

a) C1-epimers. d) C4-epimers.
b) C2-epimers. e) C5-epimers.
c) C3-epimers.

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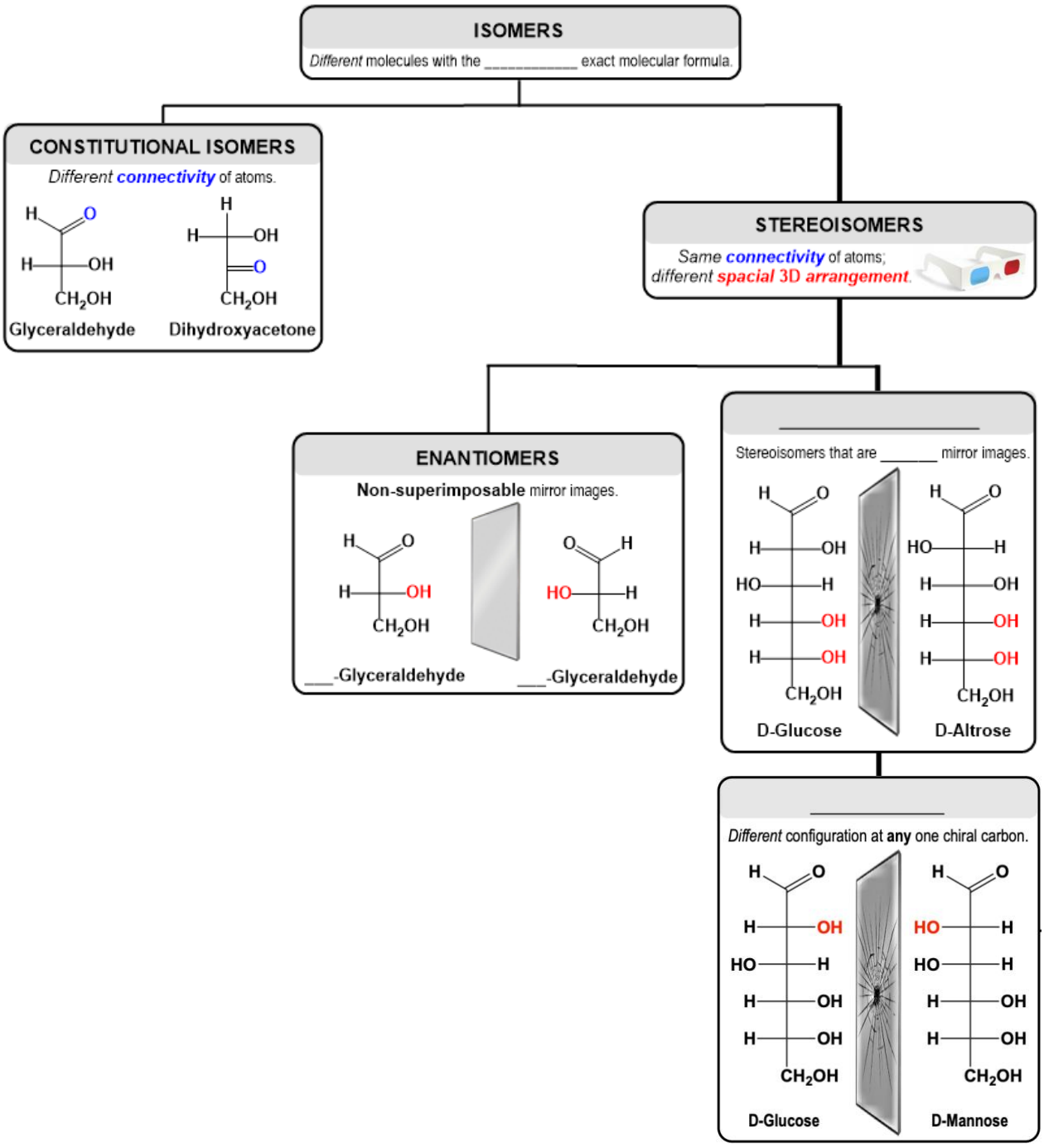
●Review of the different types of monosaccharide isomers.



PRACTICE: Two sugars which differ from one another only in configuration of one of many chiral carbon atoms are termed:

a) Epimers.
b) Enantiomers.
c) Optical isomers.
d) Stereoisomers.
e) Conformers.
f) None of these are correct.

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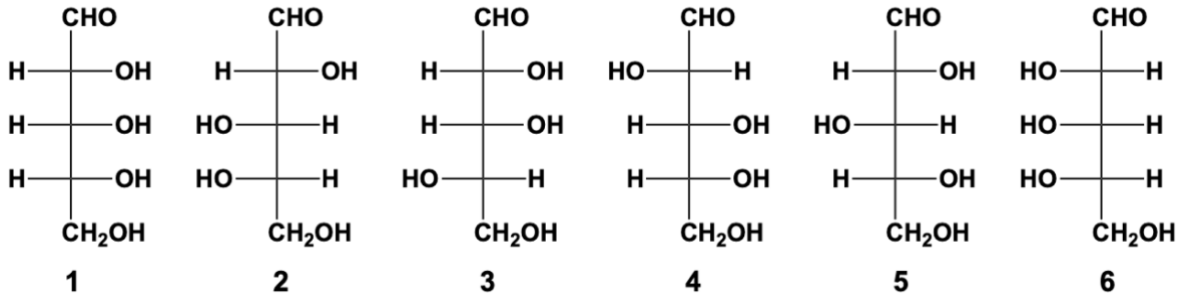
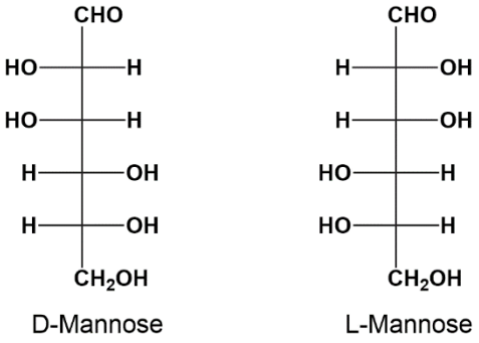
PRACTICE: Amongst the aldopentoses shown below, identify the pairs that are enantiomers.

____ and ____
____ and ____
____ and ____
____ and ____



PRACTICE: Which term best describes the relationship between D-Mannose & L-Mannose?

a) Enantiomers. b) Anomers. c) Epimers. d) Diastereomers. e) Same molecules



PRACTICE: According to the Fischer projections of the following monosaccharides, circle the C-5 epimer of **L**-Talose?