Today

Sections 4.3 - 4.8
Chirality

Next Class

Sections 4.9-4.14
Optical activity and compounds with more than one center of chirality

Determining Configuration (*R* vs *S*)

same rules as E/Z rules but do 1st, 2nd, 3rd and 4th place

Assign priorities to groups connected to chirality center

remember, it is based on atomic #

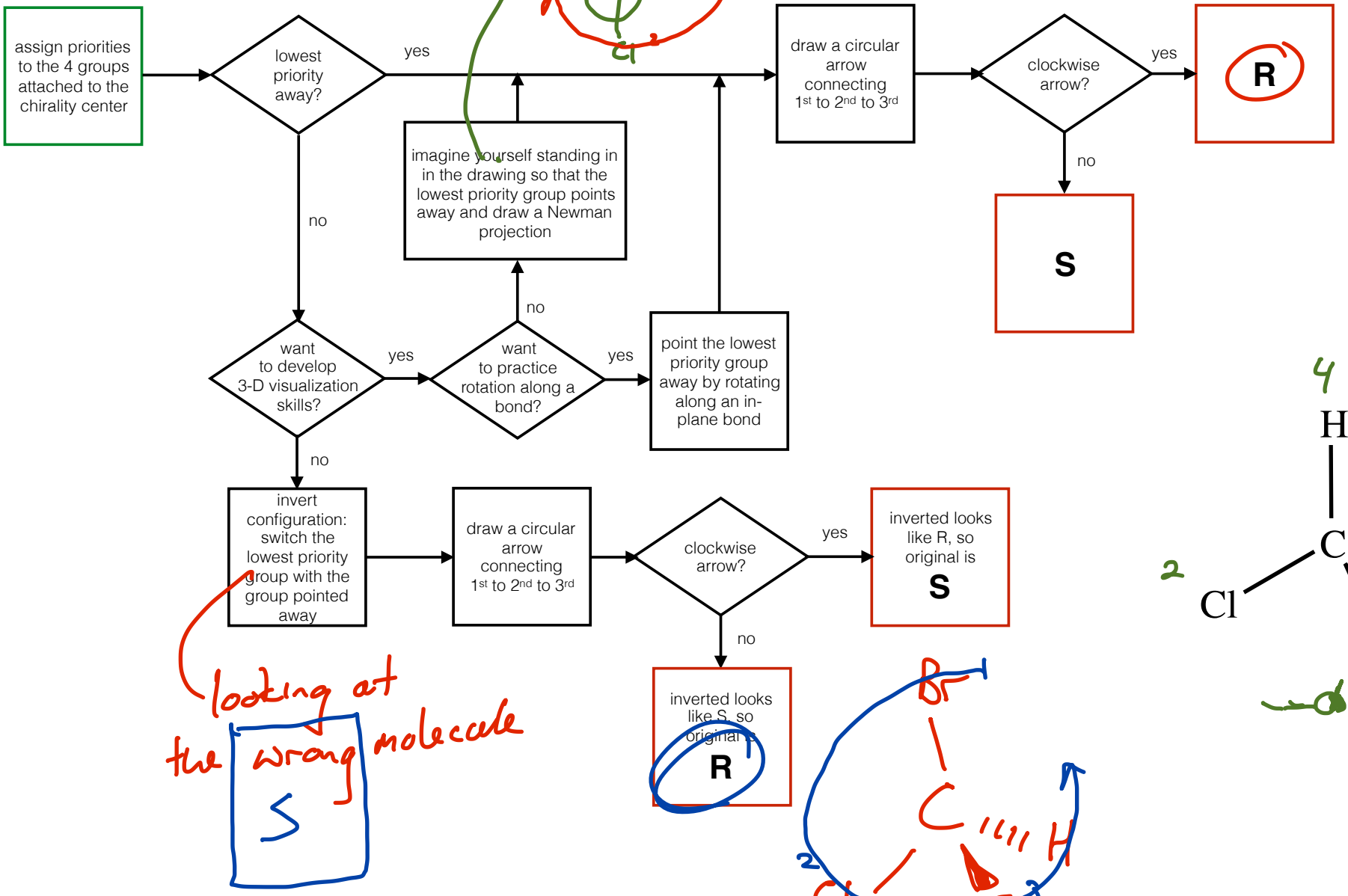
Point lowest priority group away

Draw a circle from 1st to 2nd to 3rd priority groups

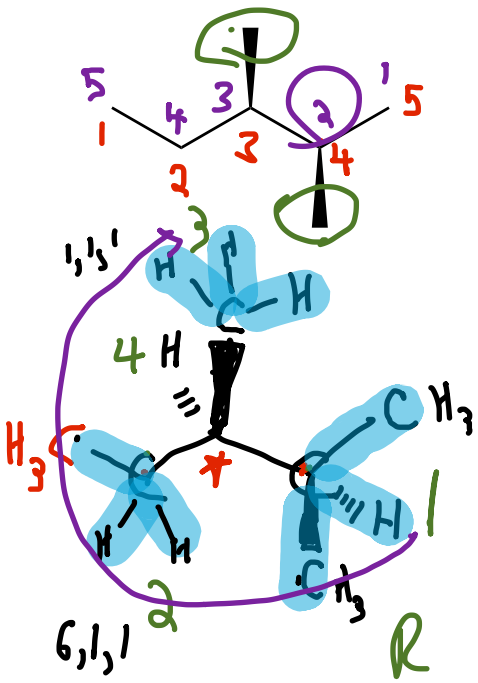
Clockwise circle is **R** configuration

Counter Clockwise circle is **S** configuration

Determining Configuration (*R* vs *S*)



all old rules + R & S rules

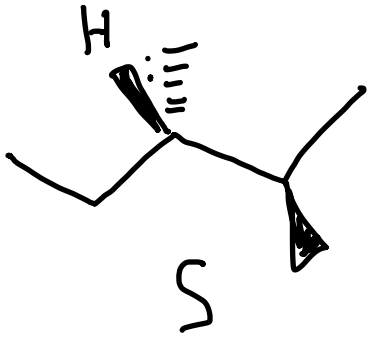


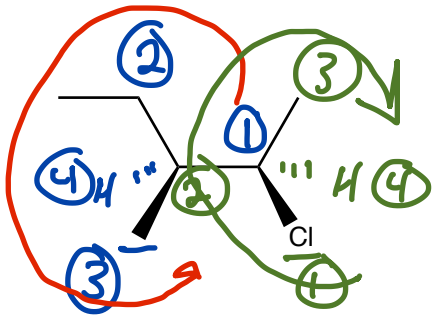
(R)-2,3-dimethylpentane

R

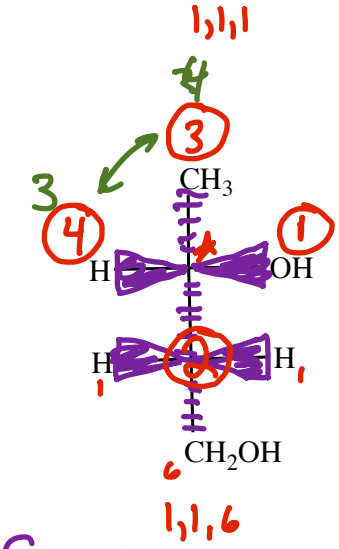
6,1,6

switching two groups inverts configuration

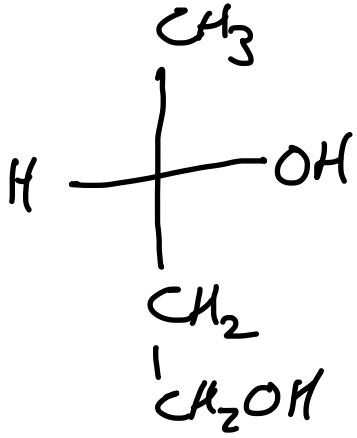


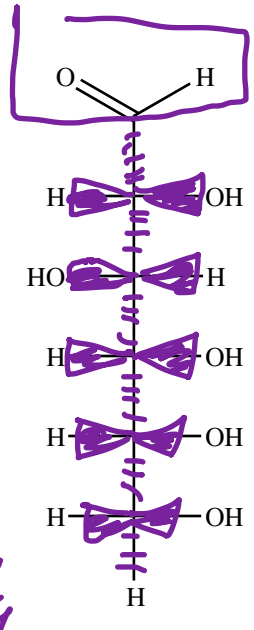


(2R,3S)-2-chloro-3-methylpentane

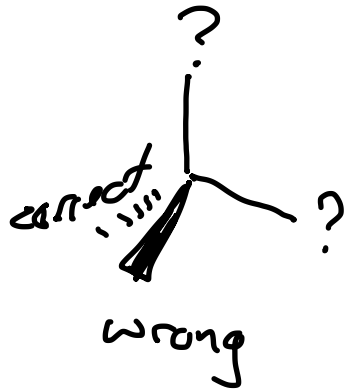


S





planar



Chain of C atoms is drawn vertically

horizontal bonds are coming out of the plane towards the viewer

vertical bonds are going out of the plane away from the viewer

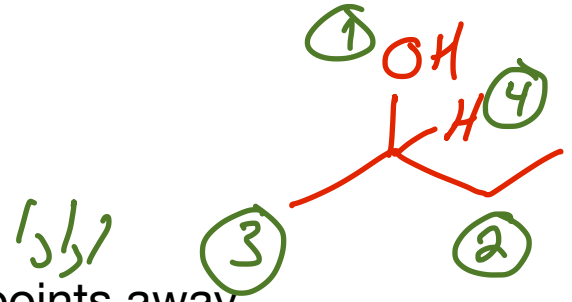
If lowest priority group is vertical 1→2→3 correct answer

If lowest priority group is horizontal 1→2-3 wrong so report other choice

R-2-butanol

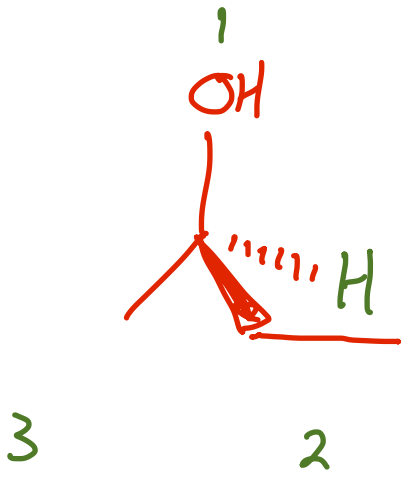
1. Draw a tetrahedral C atom

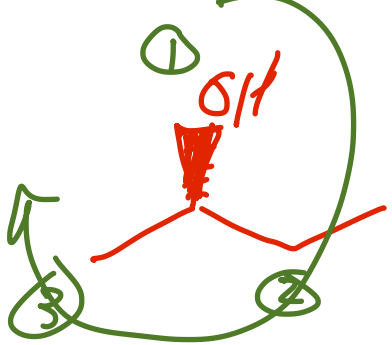
2. Assign priorities to the groups



3. Place the lowest priority group so that it points away

4. Draw in priority groups 1 through 3 in the correct (clockwise or counterclockwise) orientation.





1. Draw the molecule

2. Assign priorities and check if the correct configuration is drawn

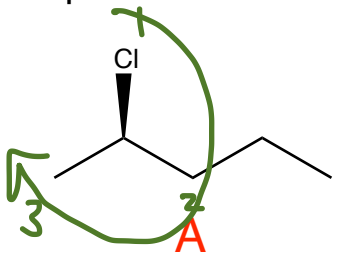
3. a. If correct, celebrate, you're done

3. b. If incorrect version is drawn, redraw molecule shaping the positions of 2 (and only two) substituents.

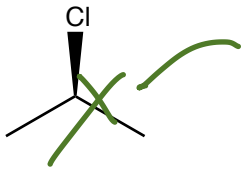
R-2-chloropentane

(2*S*,3S)-2-bromo-3-chloropentane

R-2-chloropentane

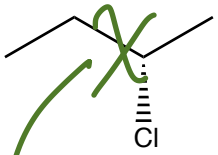


A

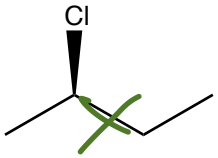


B

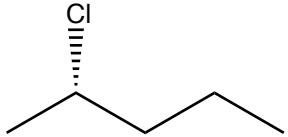
3 c atoms propane



C



D



E

4 c atoms

butane

1. Draw the molecule

2. Assign priorities and check if the correct configuration is drawn

3. a. If correct, celebrate, you're done

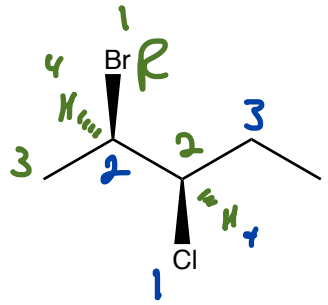
3. b. If incorrect version is drawn, redraw molecule shaping the positions of 2 (and only two) substituents.

(2*S*,3S)-2-bromo-3-chloropentane

E + Z are for  stereoisomers (diastereomers) of double bonds

R + S are for configurations of chiral atoms

R-2-chloropentane

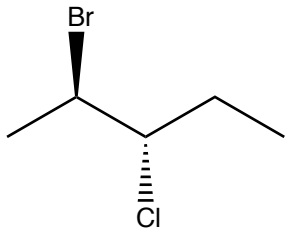


A

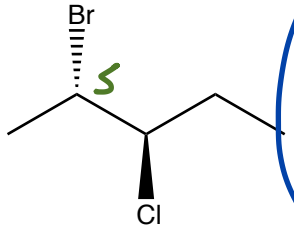
35, 6, 1

R

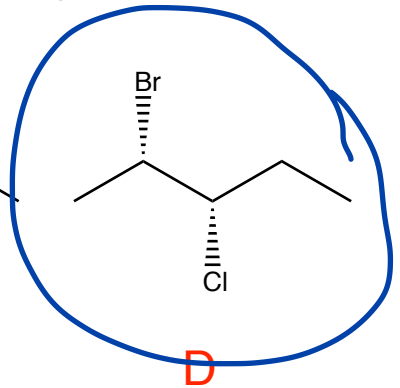
(2*S*,3S)-2-bromo-3-chloropentane



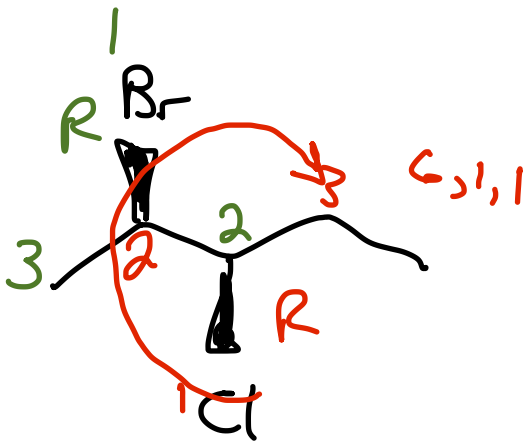
B



C



D



3, 1, 1

1, 1, 1

17, 6, 1

2^n possible stereoisomers where n = number of stereocenters