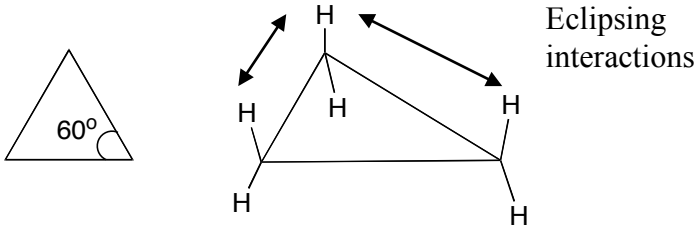
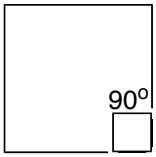
Conformation Different 3D shapes of a single (the same) molecule obtained by rotation about single bonds

Cycloalkane Conformations:

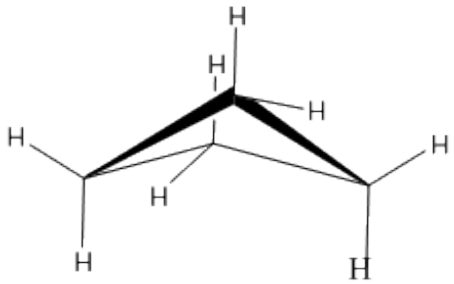
Cyclopropane –bond angle 60° – relatively rigid structure, very reactive



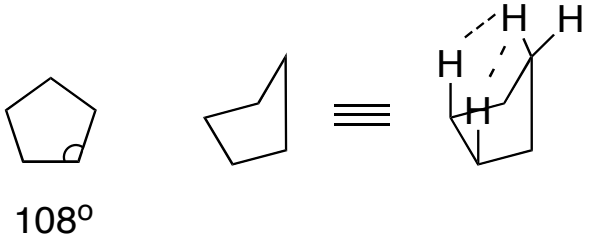
Cyclobutane – bond angle close to 90° – does have some flexibility



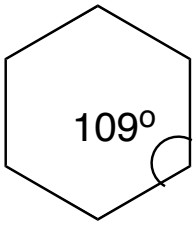
3D structure of cyclobutane:



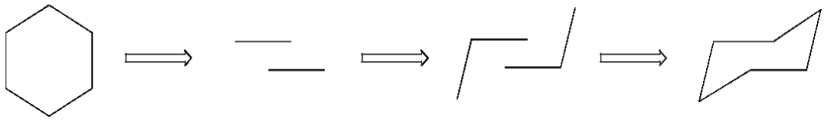
Cyclopentane – bond angles nominally 108° – more flexible than cyclobutane



Cyclohexane – bond angles actually 109°, not 120° as in flat hexagon

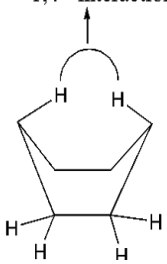


Cyclohexane Conformations – How to draw:



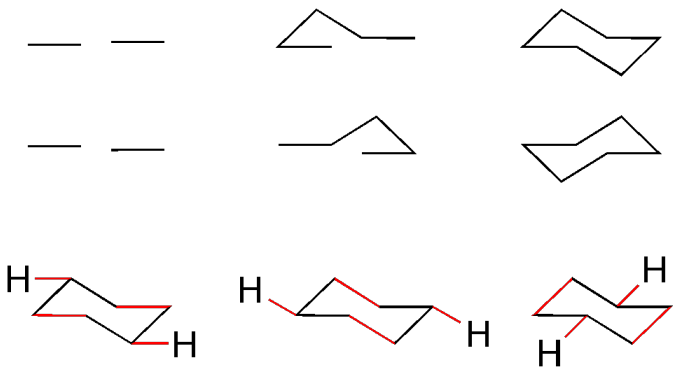
- Chair conformation (most stable)
- All adjacent hydrogen atoms are staggered

1,4 - interaction

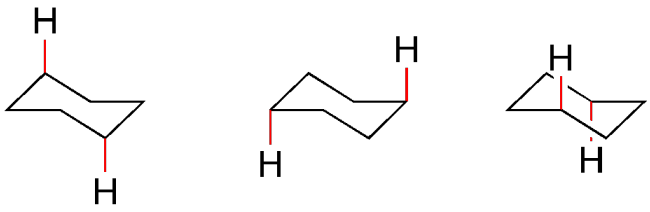


- Boat (least stable)
- many adjacent hydrogen atoms eclipsed
- 1,4 - interactions of two-hydrogens

Another way to draw cyclohexane:



Parallel Lines in Equatorial Position



Vertical Lines in Axial Position

http://www.chem.ucalgary.ca/courses/351/Carey5th/Ch03/ch3-06.html

Cyclohexane Conformations Axial vs Equatorial Positions