# 5A. For chains, draw Newman projections of all conformations around a given bond and determine their energy

OCSL 6.1 - 6.14

5A.1 Draw a Newman projection for the following around the indicated bond:



5A.2 Convert the following to skeletal structures and determine the IUPAC name.



Н

D

5A.3 Rank the following conformational isomers from least stable to most stable.





5A.4 Indicate sites of torsional and steric strain in the following:



5A.5 Draw all Newman projections for a  $360^{\circ}$  rotation around the indicated bond of the molecules below then draw a graph of strain energy versus angle.

- a) propane down C2-C3
- b) 2-methyl butane down C2-C3
- c) 2,3-dimethyl butane down C2-C3

5A.6 Draw the most stable and least stable conformation of the following molecules:

- a) 2-methyl pentane down C3-C4
- b) hexane down C3-C4
- c) 3,4-dimethyl hexane down C3-C4
- d) 2,3-dimethyl pentane down C3-C4
- e) 3-methyl pentane down C2-C3
- f) 2,2,5-trimethyl hexane down C3-C4

### 5A.7

a) If the eclipsed conformer of 1-iodoethane has total strain energy equal to 16 kJ/mol, what amount of strain is associated with eclipsed H/I bonds?

b) What types of strain are associated with eclipsed H/I bonds?

## 5B. Draw the two chair forms of a given cyclohexane and determine which is lower in energy

#### OCSL 6.15 - 6.45

5B.1 Draw both chair forms for the following cyclohexanes. Circle the more stable conformation. If equally stable circle both.



a) Draw both chair forms of the following sugars.

b) Which sugar is more stable?

5B.2



## 5C. Use skills from naming and Newman projections to determine if structures are constitutional (structural) isomers, identical or not isomers.

5C.1 Determine if the following pairs of molecules are identical, structural isomers, or not related.

