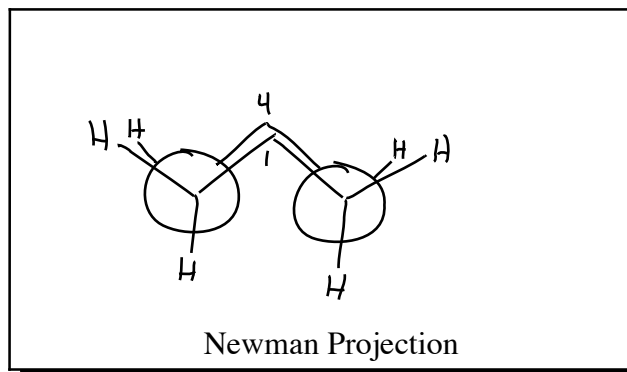
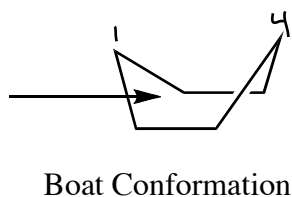
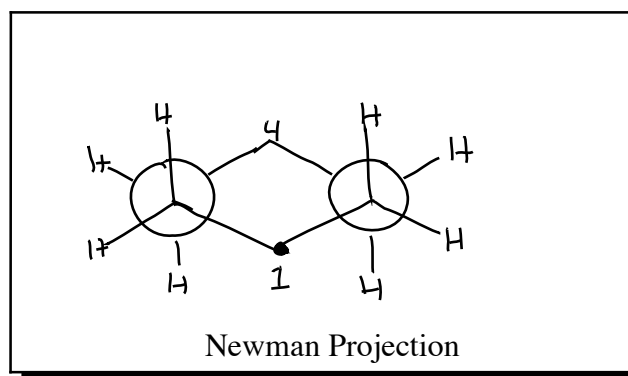
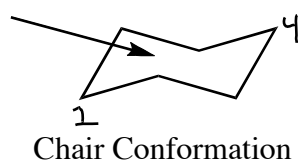
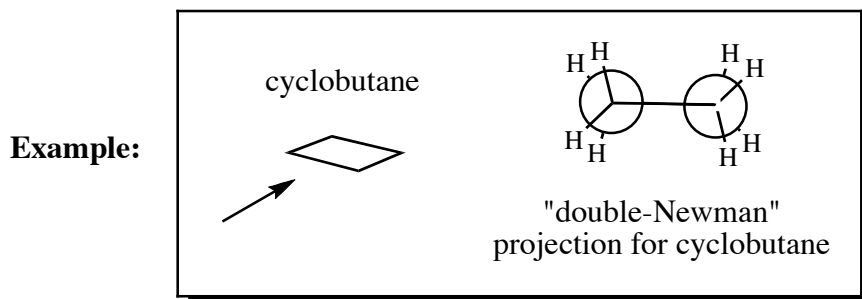


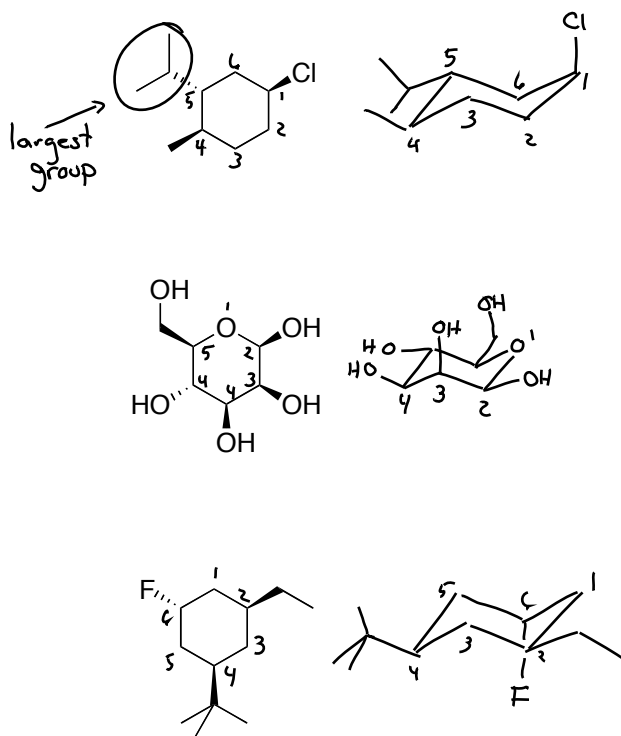
1. Using Newman projections, explain why the boat conformation for cyclohexane is higher in energy than either of the chair forms. Review your notes regarding cyclobutane to see how to draw "double-Newman projections." An example is also provided below.



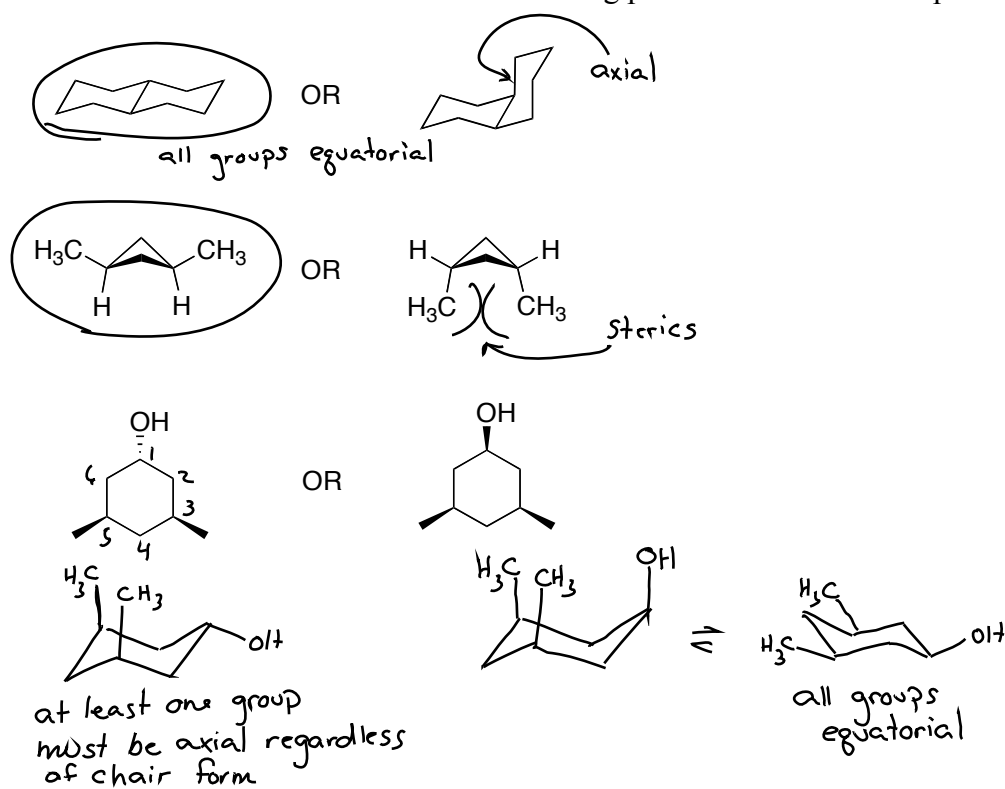
What type of interaction(s) are present in the boat conformation but NOT in the chair conformation.

Boat Conformation → 2 eclipsing states.
Chair Conformation → 2 staggered states.

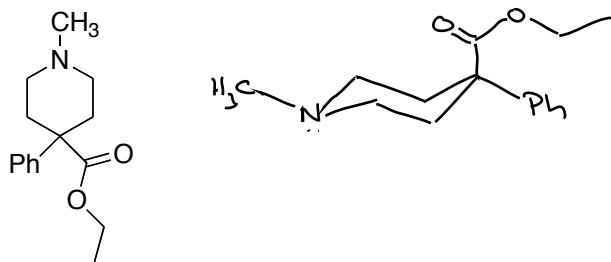
2. Draw the most stable chair conformation of each of the following molecules:



3. Which of the two structures in the following pairs is more stable? Explain why?



4. The analgesic drug Demerol (ethyl 1-methyl-4-phenyl-4-piperidinecarboxylate) is produced entirely by chemical synthesis and it acts by binding to the same receptor site as morphine in the central nervous system. In its biologically active form, the six-membered ring is in the chair conformation, with the phenyl and the *N*-methyl groups occupying equatorial positions. Use this information and provide a perspective drawing of the Demerol molecule.



5. Convert the following chair conformations to a “birds-eye” view structure:

