There are a number of important learning resources available on your unit area on the First Year Chemistry website: http://firstyear.chem.usyd.edu.au/chem1002
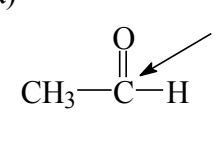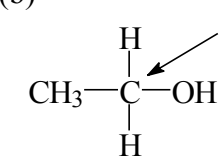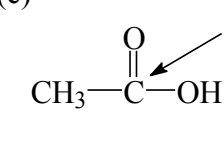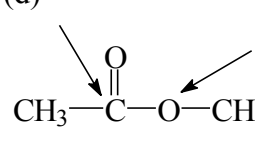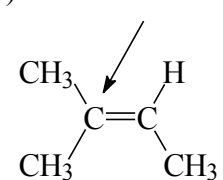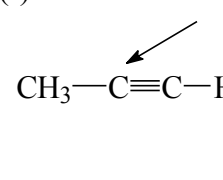
Spend some time getting yourself familiar with this website and have a look at available resources, which include self help quizzes, games and calculators.

One of the most important resources is **ChemCAL,** an interactive tutorial/quiz program which covers most of the first year chemistry topics. Past students have found the program's interactive tutorials very useful. A link to ChemCAL is provided on the menu of all First Year Chemistry webpages. You log on to ChemCAL using your course code ('1002') as username, and *helium* as the password. (Note that none of the marks you receive in the various ChemCAL quizzes are ever recorded or assessed, and multiple attempts are OK!)

Work through the ChemCAL module "*Alkanes - Structure and Nomenclature*"

Solutions to the problems below can be accessed from the 'Resources' page on your unit area on the First Year Chemistry website and on WebCT. If you have any problems, remember to ask your tutor for help during your first tutorial in week 1.

1. Draw plausible Lewis structures of the following species, including resonance structures if appropriate. (Look back at Problem Sheet 7 in the CHEM1001 section).

    (a) dimethylamine, $(CH_3)_2NH$. How many lone pairs are on the nitrogen?
    (b) acetylene, C_2H_2. How many π-bonds in this molecule?
    (c) acetone, CH_3COCH_3. How many lone pairs are on the oxygen?
    (d) acetate ion, $CH_3CO_2^-$.

2. For each of the following compounds, give the approximate bond angles at the atoms indicated by the arrows and re-draw the structures in stick representations.