We will examine the structure, shape and some bonding ideas of a few simple organic compounds.

Life and the world around us function at the molecular level. For example, if we are to understand the human body or the conversion of sunlight into usable energy, we must understand the molecular sciences such as the organic chemistry introduced in this workshop. This workshop is just the beginning. The ideas presented here will be built on, refined and will be used throughout the semester.

1. Your group will be assigned one of the above compounds.
   (a) Draw a dashed structural formula for your compound. (see section 1.17A)
      \[
      \text{H}\text{H}
      \]
      \[
      \text{H}--\text{C}--\text{C}--\text{H}
      \]
      \[
      \text{H}\text{H}
      \]
      (e.g. ethane CH₃CH₃)
   (b) Draw a bond-line structural formula for your compound. (see section 1.17C) Show all nonbonding electrons on the structure.
      (e.g. diethyl ether CH₃CH₂OCH₂CH₃)
      \[
      \text{O}-.\text{O}
      \]
   (c) Give the shape (tetrahedral, pyramidal, trigonal planar, bent or linear) at each carbon, oxygen and nitrogen atom in the three dimensional structure.
   (d) Draw at least two resonance structures of your compound. Make sure to include all nonbonded electrons and formal charges on your structure.
   (e) Arrange your resonance structures from (d), and from (b), in order of increasing importance (stability).
   (f) Indicate the hybridization of each atom (you can exclude the hydrogen atoms).
   (g) Draw a constitutional isomer of your compound (an isomer with different bond connectivity).
   (h) Draw a constitutional isomer of your compound that has one ring.