

- List three differences between prokaryotes and eukaryotes. Lots of possibilities – here are a few
  - Prokaryotes don't have organelles
  - Prokaryotes do not organize beyond single cells
  - Eukaryotes protect their genetic information in a nucleus.
- In your own words, define the first and second laws of thermodynamics
  - Energy must be conserved
  - Everything wants to be disordered
- What is the difference between an exothermic and exergonic reaction.  
Exothermic  $\rightarrow$  negative  $\Delta H$                       Exergonic  $\rightarrow$  negative  $\Delta G$
- Why have biochemists defined their own standard-state convention for thermochemical data? The standard state convention assumes 0 °C and 1.00 M concentrations of everything. This is not realistic under biological conditions. Life didn't evolve to be efficient at 0 °C and very few molecules will ever reach concentrations of 1 M *in vivo*.
- Look at Problem 1 in Chapter 1. Match the functional group or linkages with the appropriate letter.
  - Thiol
  - Carbonyl
  - Amide
  - Phosphoanhydride
  - Phosphate
  - Alcohol
- Is dihydrogen phosphate a stronger or weaker acid than ammonium?  $\text{H}_2\text{PO}_4^-$  pKa = 6.82     $\text{NH}_4^+$  pKa = 9.25  
lower pKa = stronger acid  $\rightarrow \text{H}_2\text{PO}_4^-$
- Name one molecule that is amphiphilic. Lots of possibilities - any fatty acid would work