Announcements

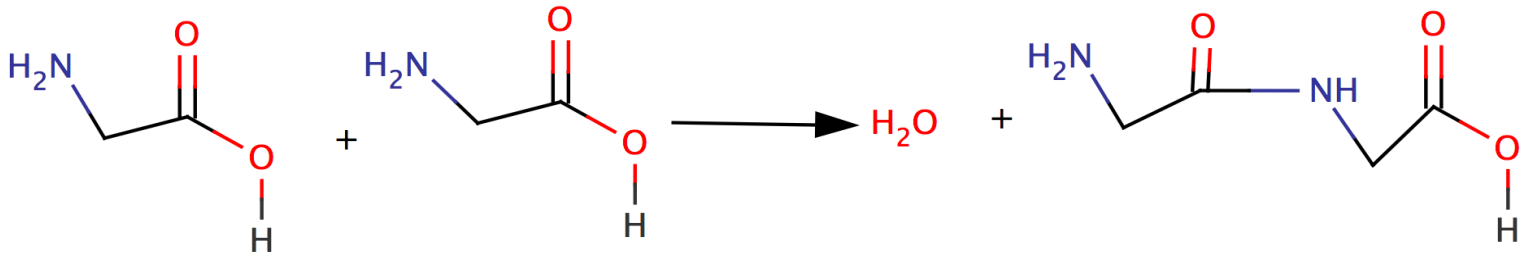
- Turn on the Clicker (the red LED comes on).
- Push “Join” button followed by “20” followed by the “Send” button (switches to flashing green LED if successful).

- Kinetics lab handout is available in the lab handout section of the class web site.

- Quiz will be just on Chapter 13. None of the Chapter 14 material covered today will be on it.

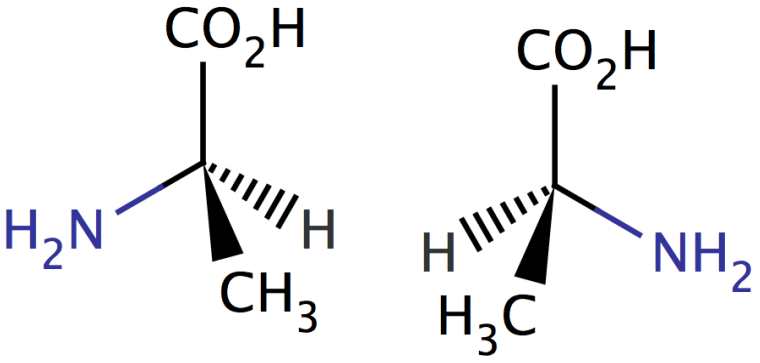
Review

- Calculating ΔG
  - From ΔH^o_f and S^o. $\Delta G = \Delta H_{sys} - T\Delta S_{sys}$
  - From ΔG^o_f. $\Delta G^o_{RXN} = \Sigma \Delta G^o_f(prod) - \Sigma \Delta G^o_f(reac)$
  - $\Delta G <$ spontaneous, $\Delta G > 0$ nonspontaneous
- Carbohydrates, Proteins, Lipids
  - Carbohydrates = starch, cellulose & sugars
  - Proteins made of chains of α-amino acids coupled by condensation reactions to form peptide bonds:



Review

- Stereoisomerism of proteins
  - 4 different groups on C make a chiral center.
  - Called stereoisomers of enantiomers.



- Lipids
  - Fatty acids bound to glycerol in a condensation reaction.
  - Saturated have no double bonds in chains
  - Unsaturated have double bonds in chains

Review
Results of Food Value Calculations

	Fuel Value (kJ/g)	Food Value (Cal/g)
glucose (carbohydrate)	15.5	3.716
Alanine (amino acid)	18.20	4.351
Tristerin (common saturated lipid)	42.35	10.12
CH_3CH_2OH (ethanol)	26.8	6.4

Catabolism

Figure 13.19

Glycolysis

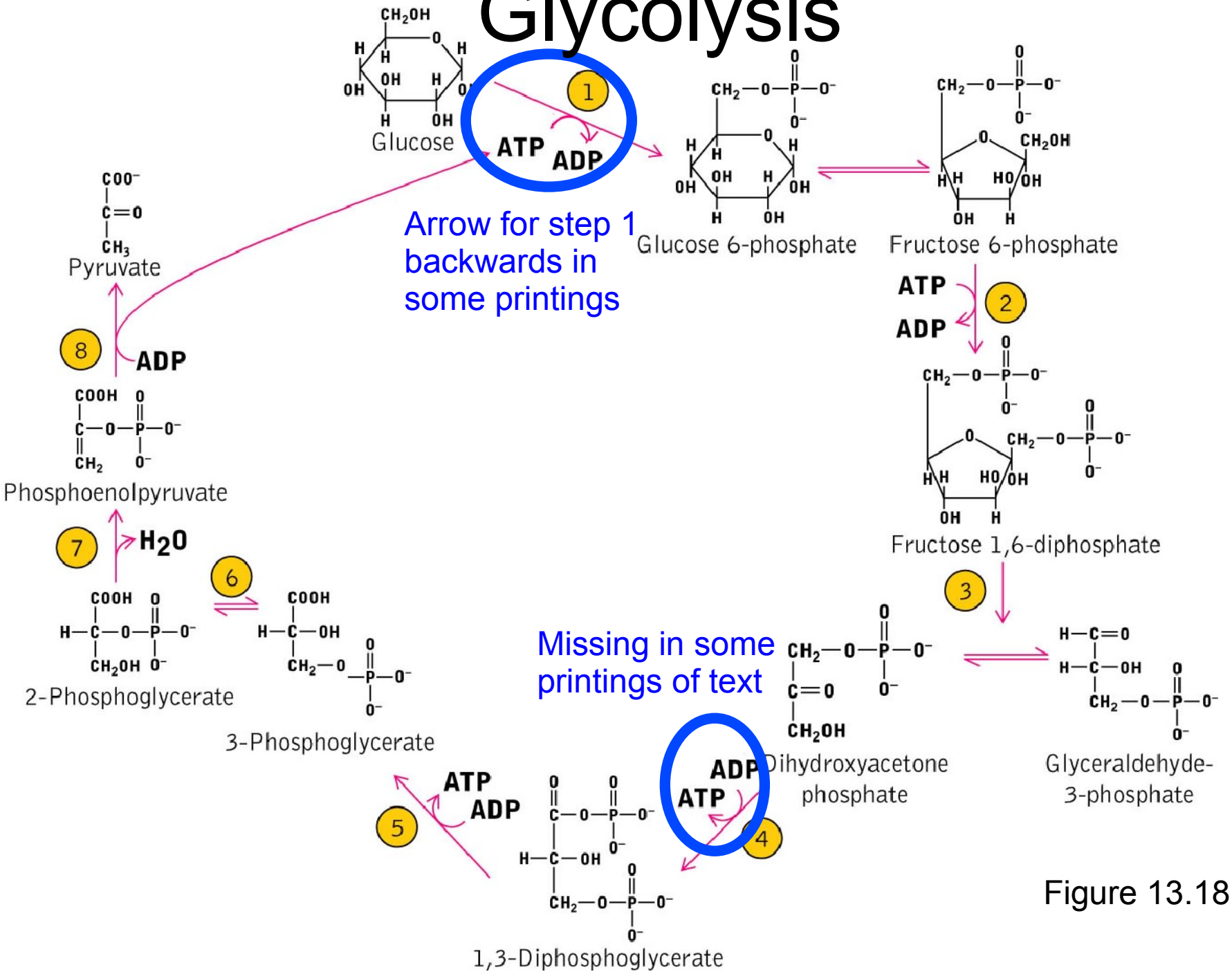


Figure 13.18

DNA (figure 13.20)

Chapter 14- Kinetics and Air Pollution

- Smog
- Reaction Rates
- Concentration effects (reaction order, rate laws, rate constant, initial rate method, pseudo-order method, integrated rate laws)
- Reaction Mechanisms (elementary steps, molecularity, rate-determining steps, steady-state assumption).
- Temperature effects (activation energy, Arrhenius equation, transition state)
- Catalysis (homogeneous, heterogeneous).

Smog

Changes in concentration versus time are the result of competing chemical reactions.

- $N_2(g) + O_2(g)$ -hot metal surfaces-> $2\ NO(g)$
- $2\ NO(g) + O_2(g) \rightarrow 2\ NO_2(g)$ $\Delta G < 0$, brown...
- $NO_2(g) + h\upsilon \rightarrow NO(g) + O(g)$
- $O_2(g) + O(g) \rightarrow O_3(g)$ $\Delta G < 0$

$$2\ NO(g) + O_2(g) \longrightarrow 2\ NO_2(g)$$

Figure 14.4