Biochemistry Chapter 1 (Biochemistry and the Unity of Life) Review

Students should know the following terms.

1.1 Atoms and Molecules

- elements
- biological fuels
- carbon

1.2 Biomolecules

- proteins
  - functions
  - amino acids
  - peptide bonds
  - catalysts
    - enzymes
- nucleic acids
  - functions
  - nucleotides
    - sugar
    - base
    - phosphoryl group
- deoxyribonucleic acid
  - ACGT
  - A-T & C-G
- ribonucleic acid
  - ACGU
- lipids
  - hydrophilic & hydrophobic
  - functions
- carbohydrates
  - functions
  - glucose - glycogen & starch

1.3 Central Dogma

- genome
- genes
- replication
- transcription
- RNA polymerase
- translation
- ribosomes

1.4 Membranes

- lipid bilayer
- eukaryotic cells
- prokaryotic cells
- plasma membrane
- plant cell wall
- cytoplasm
- organelles
  - nucleus
  - mitochondrion
  - chloroplast
- process and sorting organelles
  - endoplasmic reticulum
  - Golgi complex
  - secretory granules
  - endosome
  - lysosomes
  - plant vacuoles

Biochemistry Chapter 2 (Water, Weak Bonds, & the Generation of Order Out of Chaos) Review

Students should know the following terms.

2.1 Thermal Motions Power Biological Interactions

- Brownian motion
- water

2.2 Biochemical Interaction Take Place in an Aqueous Solution

- H_2O
  - δ^- and δ^+
- hydrogen bond
- nonpolar, hydrophobic

2.3 Weak Interactions are Important Biochemical Properties

- electrostatic interactions
  - ionic bonds, salt bridges
  - 3 Å
- hydrogen bonds
  - O & N
  - 1.5-2.6 Å, 2-5 kcal/mol
- van der Walls interactions
  - asymmetric electronic charge
  - contact distance
  - 3-4 Å, 0.5-1 kcal/mol
- "stability in numbers"
- easily broken

2.4 Hydrophobic Molecules Cluster Together

- entropy
- membrane formation
- amphipathic
- protein folding

Functional Groups Table 2.1 (plus a few more)

- methyl
- disulfide
- ester
- acetyl
- hydroxyl
- aldehyde
- keto
- carboxyl
- amino
- phosphate
- sulfhydryl