

REVIEW TOPICS TO PREPARE FOR THE HEALTH BIOLOGY PROFICIENCY EXAM

A. Basic Chemistry

1. Inorganic

- a. atomic structure
elementary particles (protons, neutrons, electrons), atomic number, atomic mass, isotopes, chemical symbols
- b. atoms and molecules
ionization, anions, cations, bonding: ionic, covalent (polar, non-polar), hydrogen
- c. acids, bases, pH, buffers

2. Organic

- a. functional groups, example: amino group, carboxyl group, hydroxyl group
- b. biologically important molecules:
carbohydrates, lipids, proteins, nucleic acid

B. Cell Structure and Function

1. structure of the cell membrane
2. movement of molecules: osmosis / diffusion / active transport
3. cell organelles, example: structure and function of mitochondria, nucleolus, lysosome, ribosome, endoplasmic reticulum, vesicle, nucleus, Golgi apparatus, etc.
4. energetics
 - a. synthesis and hydrolysis of ATP
 - b. aerobic metabolism (cell respiration), example: Krebs cycle, electron transport system, etc.)
 - c. anaerobic metabolism (glycolysis)
5. protein synthesis
 - a. role of DNA, RNAs
 - b. genes
6. mitosis / meiosis

C. Chemical Composition of the Body

1. osmolarity
 - a. hyper-, hypo-, isotonic solutions and how they relate to osmosis
2. acids, bases, buffers

To prepare for the Health Biology Proficiency Test, read and study chapters 2-6, 8-11, & 14 in *Cell Biology and Genetics*, 10th ed., (Starr, Cecie), and the *Biology 121 Supplement* (Solomon), both on reserve in the LCC Library and in the LSARC, Room 455, Arts & Sciences Bldg.