

Concepts of Science - Study Guide for Exam 2

Listed below are a number of concepts, people and techniques that you should be familiar with:

Chapter 5 Macromolecular Structure Monomers and polymers, biological polymers, proteins, amino acids, amino acid sequences, enzyme, catalyst, nucleic acids, DNA, RNA, the genetic code, nucleic acid synthesis, the mechanism of protein synthesis, base pairing, double helix, carbohydrates, starch, cellulose, lipids, micell, fats, lipid bilayer, mitochondria, ribosomes, DNA fingerprinting, Watson and Crick, virus, retrovirus, AIDS. **Problems involving** stoichiometry, peptide sequences, and translating the genetic code (taking information from DNA to RNA to proteins).

Chapter 6 Cellular Structure The general structure of a cell, prokaryotic cells eukaryotic cells, four important classes of molecules (the molecules of life: proteins, hucleic acids, carbohydrates, lipids), structure of the cell wall, virus, DNA virus, RNA virus, virus life cycle, retrovirus, AIDS, strategies for treating AIDS.

Chapter 7 Working with Energy The first and second laws of thermodynamics, conservation of energy, entropy, measuring energy, various kinds of energy and how they interconvert, sloar energy, geothermal energy, fuel cells, wind energy, biomass, global energy problems and potential solutions. **Problems involving** kinetic and potential energy, exothermic and endothermic reactions, heat of combustion.

Chapter 8 The Nature of Light Wavelength, frequency and energy of light, **Problems involving** the interconversion of wavelength and frequency, electromagnetic spectrum, the wave nature of light, the particle nature of light, lasers, global warming, CO₂, the greenhouse effect, **Problems involving** calculation of the amount of CO₂ released from a burning fuel, chlorofluorocarbons and the destruction of the ozone layer, F. S. Rowland, the role of chlorine atoms in ozone destruction, ozone and air pollution, acid rain, the concept of pH, solar energy, solar cells, the speed of light, Michelson and Morley, Einstein, the special theory of relativity, the concepts of relativistic mass, length, and time. **Problems involving** calculation of relativistic mass, length, and time (given the formulas).