A & P Placement Exam Outline & Resources List

1) Basic Math / Problem Solving
    a. Know:
        i. Dimensional Analysis
        ii. Conversion Factors
        iii. Dosing calculations
        iv. Basic Algebraic manipulations
    b. Resources:
        i. testandcalc.com: http://www.testandcalc.com/
            1. This site has dosage calculations tutorials, games (like hangman) and practice quizzes
            2. There is a free trial download or you can register for a paid membership with increased features.
        ii. santarosa.edu: http://online.santarosa.edu/presentation/page/?95907
            and http://online.santarosa.edu/presentation/page/?95911
            1. This site has dimensional analysis and dosage related math tutorials, practice problems and quizzes.
        iii. M2hnursing.com: http://www.m2hnursing.com/MedCal/module1_1.php
            1. This site has tutorials for basic math, dosage calculations and medication administration.

2) Basic Chemistry
    a. Know:
        i. Differences between Protons, Electrons & Neutrons
        ii. Differences between Atoms, Ions & Isotopes
        iii. Differences between Bond Types
        iv. Electron Shell Organization & # of Bonds possibly formed by atoms
        v. Differences between Elements, Compounds & Mixtures
        vi. Differences between Heterogeneous & Homogeneous mixtures
    b. Resources:
        i. LSC computers: Desktop/Science /Chemistry of Life CD/Atoms & Molecules
        ii. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Chemistry
            1. Atomic Structure
            2. Chemical Bonding

3) Water & pH
    a. Know:
        i. Differences between Acids & Bases
        ii. The pH scale and what it means
        iii. Types of bonds in a Water Molecule
        iv. Physical & Chemical characteristics of Water
    b. Resources:
        i. LSC computers: Desktop/Science/Chemistry of Life CD/Water
        ii. LSC computers: Desktop/Science /Chemistry of Life CD/Reactions & Equilibrium
        iii. LSC computers: Desktop/Science /Chemistry of Life CD/Acids, Bases & pH
        iv. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Chemistry/pH
        v. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Molecules of Life
            1. Water

4) Biochemistry
    a. Know:
        i. The four classes of macromolecules
        ii. Monomers of each of the 4 classes of macromolecules
        iii. Polymer names of each of the 4 classes of macromolecules
        iv. Molecular composition of each of the 4 classes of macromolecules
        v. Examples of each of the 4 classes of macromolecules
        vi. Bond types in each of the 4 classes of macromolecules
        vii. Functions of each of the 4 classes of macromolecules
        viii. Compositions of the Earth and/or organisms (especially humans)
    b. Resources:
        i. LSC computers: Desktop/Science /Chemistry of Life CD/Organic Molecules
        ii. LSC computers: Desktop/Science /Chemistry of Life CD/Carbohydrates
        iii. LSC computers: Desktop/Science /Chemistry of Life CD/Lipids
        iv. LSC computers: Desktop/Science /Chemistry of Life CD/Proteins
        v. LSC computers: Desktop/Science /Chemistry of Life CD/Nucleic Acids
        vi. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Molecules of Life
            1. Organic Chemistry
            2. Carbohydrates
            3. Lipids
            4. Proteins

5) Enzymes/Energy
    a. Know:
        i. The types of energy
        ii. Understand the laws of thermodynamics
        iii. What a catalyst is and how they work
        iv. Understand the stages of a reaction
        v. The composition and functions of ATP
    b. Resources:
        i. LSC computers: Desktop/Science /Chemistry of Life CD/Enzymes and Pathways
        ii. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Molecules of Life
            1. Enzymes
            2. Pathways & Feedback
            3. ATP
            4. Respiration
        iii. LSC computers: Desktop/Science /Modules/ENZYME Module.ppt

6) Cell Structure & Function
    a. Know:
        i. The names, locations and appearance of the organelles of a Eukaryotic cell
        ii. The functions and processes of the organelles.
        iii. Hierarchical organization of life.
    b. Resources:
        i. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Cell Structure
            1. all
        ii. LSC computers: Desktop/Science /Modules/Cell Structure Module Bio 109.ppt
        iii. LSC computers: Desktop/Science /Modules/Bioflix/Tour Of An Animal Cell

7) Cell/Membrane Transport
    a. Know:
        i. The types of transport
        ii. Characteristics of each type of transport (w/ or against gradient, require energy?, require carrier?)
        iii. The types of molecules that use each type of transport.
        iv. Types of tonicity & their characteristics.
        v. Affects of tonicity on a cell.
    b. Resources:
        i. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Cell Structure
            1. Membrane Structure
        ii. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Membrane Functions
            1. All

8) Cell Reproduction
    a. Know:
        i. The phases of the cell cycle and their characteristics.
        ii. The phases of mitosis and their characteristics.
        iii. The overall goals of mitosis/cell cycle.
        iv. Characteristics and make up of chromosomes.
        v. Differences between chromosomes, chromatin, chromatids and homologous pairs.
        vi. Characteristics and make up of DNA and how DNA is synthesized / replicated.
    b. Resources:
        i. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Cell Division
            1. All
        ii. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Cellular Functions
            1. Nucleic Acids
            2. DNA Structure
            3. RNA
        iii. LSC computers: Desktop/Science /Modules/Bioflix/Mitosis

9) Protein Synthesis
    a. Know:
        i. The stages of protein synthesis and their characteristics.
        ii. Basic terminology: codon, anticodon, gene, etc.
        iii. Understand the ribosome and what it does.
        iv. The characteristics and makeup of DNA, RNA & Proteins.
        v. The 3 types of RNA involved in protein synthesis.
        vi. The roles of DNA and of each type of RNA in protein synthesis.
    b. Resources:
        i. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Molecules of Life
            1. Proteins
        ii. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Cellular Functions
            1. RNA
            2. Transcription
            3. Translation
            4. Gene Regulation
        iii. LSC computers: Desktop/Science /Modules/Bioflix/Protein Synthesis

10) Cell Respiration
    a. Know:
        i. Anaerobic vs Aerobic Respiration.
        ii. The different stages of cell respiration and their characteristics.
        iii. The location (in the cell) of the various stages.
        iv. The reactants and products of each stage (including products produced under different conditions).
        v. The various molecules involved and what they do.
        vi. ATP: what it is, it's characteristics, and why it's important to the cell.
        vii. The overall chemistry of cellular respiration.
    b. Resources:
        i. LSC computers: Desktop/Science /Chemistry of Life CD/Enzymes and Pathways
        ii. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Molecules of Life
            1. Enzymes
            2. Pathways & Feedback
            3. ATP
            4. Respiration
        iii. LSC computers: Desktop/Science /Modules/Bioflix/Cell Respiration
        iv. LSC computers: Desktop/Science /Modules/ENZYME Module.ppt

11) Homeostasis
    a. Know:
        i. Types of feedback and their characteristics
        ii. General terminology: Stimulus, Receptor, Control Center, Effector, Result
        iii. Be able to identify examples of each of the above.
    b. Resources:
        i. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version) /Introduction
            1. Homeostasis
        ii. LSC computers: Desktop/Science /Anatomy & Physiology ESP2 (iE version)/Molecules of Life
            1. Pathways & Feedback
        iii. http://www.occc.edu/biologylabs/Documents/Homeostasis/homeostasis_tutorial.htm
        iv. http://ats.doit.wisc.edu/biology/ap/ho/ho.htm

12) Graphing
    a. Know:
        i. Horizontal vs Vertical Axis & the variables they represent.
        ii. Direct vs Indirect relationships.
        iii. How to read a graph.
    b. Resources:
        i. LSC computers: Desktop/Science /Modules/Bio 101 Graphing Module.ppt
        ii. LSC computers: Desktop/Science /Modules/Bio 101 Graphing Worksheet.doc
        iii. http://www.tv411.org/reading/understanding-what-you-read/reading-charts-and-graphs/activity/1/7
        iv. http://english-zone.com/reading/charts-01.html
        v. https://www.superteacherworksheets.com/graphing.html
        vi. http://www.biologycorner.com/worksheets/interpreting_graphs.html
        vii. http://commoncoresheets.com/BarGraphs.php
            1. Also look on the left for pages about line and pie graphs!
        viii. http://www.teach-nology.com/worksheets/math/graph/

13) Reading Comprehension
    a. Know:
        i. How to filter out the important information in a word problem.
    b. Resources:
        i. http://www.beatthegmat.com/mba/2010/08/25/gmat-science-reading-comprehension
        ii. http://www.majortests.com/sat/reading-comprehension.php

Additional Study Tips:

If you are in a Lecture class (Bio 099 or Chem 101):

1) Read each chapter before going to class
2) If your instructor allows access to the lecture notes via blackboard, read those before going to class
    a. The instructor's lecture shouldn't be your first exposure to the material (1 & 2 above are very important)
3) Sometime soon after class, re-read the chapter along with your notes and the blackboard notes in more detail
4) Before the exam (in class or placement exam), re-read all relevant material concentrating on areas that you struggled with

If you are in an online class (Bio 109):

1) Go through each module multiple times
2) If the instructor allows retaking quizzes…retake them as many times as possible
3) Consider any optional assignments as mandatory
4) Don't be afraid to set up meetings for help.

- Remember: There is no substitute for hard work and the more times you expose yourself to the relevant material, the more likely you will be able to recall it when needed.
- Also Remember: The goal is not only to be able to pass the A & P Placement exam, but also to retain the information necessary to perform well in A & P itself (Bio 103 & Bio 104)