A.P. Biology ~ Summer Assignments

A.P. Biology is an in depth study of organisms on macroscopic, microscopic, and chemical levels. The main purpose of the course is to prepare the student for the A.P. Biology Exam in May, and it is expected that students enrolled in A.P. Biology will take the exam.

Your summer assignment will be to review chemistry. To truly comprehend the biologic concepts presented in A.P. Biology, one needs a solid foundation in chemistry. Thus, the completion and understanding of high school chemistry is a recommendation/prerequisite for A.P. Biology. If you have not completed chemistry, it is essential to you get a chemistry textbook and teach yourself over the summer (pick up a "Chemistry Stuff to Know" sheet). Even the brightest students who have not taken chemistry prior to this course have found it difficult to keep up.

Your summer assignments: This should be a review of the suggested chemistry prerequisite.

- **Check out an A.P. Biology text and study guide** (many students like to purchase the study guide so they can write in them). Do it early as there are no textbook checkouts between senior checkout and summer school.
- **Read Chapters 1-4.** Chapter 1 is an overview of A.P. Biology. Chapters 2-4 should be a review of the material covered in chemistry that will be woven throughout the A.P. Biology curriculum. Note: Especially with science texts, the saying 'a picture is worth a thousand words' is true. Spend time deciphering what each graphic is illustrating.
- **Outline or do the *Reading Guides (recommended)* posted on Learning Point for chapters 1-4**. The reading guides help guide you to the pertinent information as you thoroughly answer the questions. A good outline covers **only** the pertinent information from the chapter and is ***written in your own words***. Your outline and reading guides should sound like you (not the text) and should pose questions to remind yourself where additional explanation is needed. Most of the information you will learn in AP biology is from the text… you must understand it!
- **Do the Study Guide that pertains to each chapter after you have read it.** Use the book or the study guides posted on Learning Point. The practice tests at the end will help prepare you for the real tests. The CD-ROM that comes with your text also has **objective questions**. You should be able to answer these when done. The more you practice the better off you will be.
- **Answer the following essays** in paragraph form. Each essay is a free response that should be completed in about 25 minutes (more of a 'quick write' in complete supported sentences) and does NOT have to be completed in the 5 paragraph essay (or any other) format.

1. Chemical bonds are essential to building the 'molecules for life'. In 3 paragraphs, describe the following bond types and how they are significant to life on earth: ionic, covalent (polar and non-polar), hydrogen, and Van der Wahls (interactions).

2. The unique properties (characteristics) of water make life possible on Earth. In 3 paragraphs, select three properties of water and:
   a) for each property, identify and define the property and explain it in terms of the physical/chemical nature of water.
   b) for each property, describe one example of how the property affects the functioning of living organisms.

3. Carbon is a very important element in living systems. Describe the various characteristics of the carbon atom that makes possible the building of a variety of biological molecules thus life as we know it.

The above outlines, study guides and essays are due the first week of school.

Facts about the Class and the Exam

The A.P. Biology Exam is 60% multiple choice and 40% free response. You will be given eighty minutes to complete 100 multiple-choice questions and another 90 minutes to complete 4 free response answers.

Your grade in the course will be weighted as follows: 70% exam (multiple choice and essay) scores and 30% labs and homework.

Both the course and the exam will be broken down as follows:

I. Molecules and Cells (25%)

A. Chemistry of Life (7%)

1. Water
2. Organic molecules in organisms
3. Free energy changes
4. Enzymes

B. Cells (10%)

1. Prokaryotic and eukaryotic cells
2. Membranes
3. Subcellular organization
4. Cell cycle and regulation

C. Cellular Energetics (8%)

1. Coupled reactions
2. Fermentation and cellular respiration
3. Photosynthesis

II. Heredity and Evolution (25%)

A. Heredity (8%)

1. Meiosis and gametogenesis
2. Eukaryotic chromosomes
3. Inheritance patterns

B. Molecular Genetics (9%)

1. RNA and DNA structure and function
2. Gene regulation
3. Mutation
4. Viral structure and replication
5. Nucleic acid technology and applications

C. Evolutionary Biology (8%)

1. Early evolution of life
2. Evidence for evolution
3. Mechanisms of evolution

III. Organisms and Populations (50%)

A. Diversity of Organisms (8%)

1. Evolutionary patterns
2. Survey of the diversity of life
3. Phylogenetic classification
4. Evolutionary relationships

B. Structure and Function of Plants and Animals (32%)

1. Reproduction, growth, and development
2. Structural, physiological, and behavioral adaptations
3. Response to the environment

C. Ecology (10%)

1. Population dynamics
2. Communities and ecosystems
3. Global issues

Proposed A.P. Biology Timeline
2008-2009

Week	Theme	Chapters	Labs
1	Themes/Chem	1, 2	Fishy ExD
2	Chemistry	3	Diffusion and Osmosis – Lab 1
3	Chemistry	4, 5	
4	Cells	7, 8	
5	Cells	11, 12	Mitosis – Lab 3A
6	Cells	45, 48, 49	
7	Energy	41	Enzyme Catalysis – Lab 2
8	Energy	6, 9	Cell Respiration – Lab 5
9	Energy	10	Plant Pigments and Photosynthesis – Lab 4
10	Ecology	50, 51	
11	Ecology	52	Aquatic Primary Productivity – Lab 12
12	Ecology	53	Animal Behavior – Lab 11
13	Ecology	54, 55	
- -	Thanksgiving	TBD	
14	Homeostasis	40, 41	
15	Homeostasis	42, 43, 44	Physiology of Circulatory System – Lab 10
- -	Winter	TBD	
- -	Break	TBD	
16	Meiosis	13	Meiosis – Lab 3B
17	Reproduction	46	
18	Genetics	14, 15	Genetics of Organisms (Fruit Flys) – Lab 7
19	DNA	16, 17	Molecular Biology: Transformation – Lab 6A
20	DNA	18, 19	
21	Biotechnology	20	
- -	Feb. Break	TBD	
22	Biotechnology	21	Molecular Bio: Electrophoresis – Lab 6B
23	Evolution	22, 23	
24	Evolution	24	Population Genetics and Evolution – Lab 8
25	Phylogeny	25, 26, 27, 28	
26	Phylogeny	29, 30, 31	
27	Phylogeny	32, 47	
- -	Spring Break	TBD	
28	Phylogeny	33, 40, 34	
29	Plants	35, 36, 37	
30	Plants	38, 39	Transpiration – Lab 9
31	Review	All Chapters	
32	Final Exam	All Stuff	4 Essays + 200 pt. MC
33	AP Tests		
34	AP Tests		AP Exam → May 12!
35 - 40	Real Learning	Ishmael, et al.	

Chemistry "Stuff to Know"
for AP Biology
(for those who have yet to take Chemistry)

1. Go to the RBHS library textbook window and check out "General Chemistry" by Ebbing/Gammon (this is the honors chemistry text for our school)

2. Tell them you are taking AP biology and need to check out this book to learn some chemistry. You can check it out from June 1-8 before or after school and break and also on June 27-29 from 7:30 am-3:00 pm. The book is due back during registration so it will be ready to be checked out to kids actually taking Honors Chemistry during the year.

3. The things in this book you will be responsible for understanding when you come into AP bio.are as follows:

   Ch. 1 – 1.3: Law of Conservation of Mass, 1.4: Matter, Chromatography pp 15-16

   Ch. 2 – 2.3: Isotopes, 2.6: Molecular and Ionic Substances, 2.7: Organic Compounds

   Ch. 4 – 4.4: Acid-Base Reactions, 4.5: Oxidation-Reduction, 4.7: Molar Concentrations

   Ch. 7 – 7.1: The Wave Nature of Light

   Ch. 9 – 9.1: Ionic Bonds, 9.4: Covalent Bonds, 9.5: Electronegativity

   Ch. 11 – 11.5: Liquids

   Ch. 19 – ALL OF IT!!! Thermodynamic and Equilibrium (ΔG especially)

   Ch. 21 – 21.4: Radioactive Decay

Study Hard Now!

So you won't have to later!!! ☺