THE AP BIOLOGY EXAM

- The test will consist of two sections. The first has 63 multiple-choice questions and 6 mathematics grid-in questions with a **90 minute** time limit. The questions consist of regular knowledge questions, matching in the form of multiple-choice, and lab set questions where you answer a series of questions based on a graph or situation. You will be given a formula sheet to help answer questions, and four function calculators are allowed. Answer all the ones you know first, then go back and guess at any question which you can narrow your choices down to two. **There will be NO deduction for missed answers, only credit for right answers.**
- There will be a 10 minute break between sections.
- The second section contains 2 long free-response questions and 6 short free response questions to be answered in an essay format. You will be given 10 minutes of reading time before you begin your writing. You are encouraged to make notes, underline important words, and outline points. The 2 long essay questions should be completed in 20 minutes each. The 6 short essay questions should be completed in 6 minutes each. You will have **80 minutes** to complete this section.

MULTIPLE CHOICE

- 63 questions
- 6 grid-in questions
- 90 minutes
- 50% of exam grade
- 4-function calculator and pencil

FREE RESPONSE

- 2 long essay questions and 6 short essay questions
- 10 minutes reading + 80 minutes
- 50% of exam grade
- 4-function calculator and pen
- One of the 2 long essay questions will be a lab based questions
- Organizing, reasoning, and analyzing skills are needed along with an ability to synthesize material from several sources into a coherent essay

** REMEMBER: You don't have to know it all and do the best you can with the questions given.

THE AP BIOLOGY EXAM GRADING SYSTEM

5 - Extremely well qualified
4 - Well qualified
3 - Qualified
2 - Possibly qualified
1 - No recommendation

Lab Report General Format

1. Title
    a. The title should state the exact problem tested in the lab. Most labs will have multiple parts, but the report will be focused on one or two main sections.
    b. The title should contain both the independent and dependent variables and can be a question or a statement
    c. **Examples of Bad Titles**: Cell Respiration, Lab 5, How does cell respiration change in different peas?
    d. **Examples of a Good Title**: How does oxygen intake differ in germinating versus non-germinating peas and with differences in temperature?
2. Introduction
    a. Paragraph discussion about the main scientific principles tested in the lab
    b. You should not discuss results or any specifics relating to the experiment. This paragraph or two just discusses the background knowledge you should know going into the lab.
    c. Use the introduction of the lab to help you and your textbook/notes, but DO NOT copy material word for word.
3. Hypothesis, Variables, Controls/Constants, Materials, Procedure
    a. This section is done as a list, and most of the time the materials and procedures will be addressed by writing: See lab handout
    b. Each part must be labeled
4. Results: Tables and Graphs
    a. All tables and graphs need to have a title, and again Graph 1 is not an acceptable title. Graph titles need to have the specific data listed that you find in the graph
        i. Example: Change in oxygen intake with differing rates of germinated peas
    b. Most table titles can be found in the lab manual as you fill them in during the actual experiment
    c. All important tables and graphs will be recreated in the report or completed in the lab manual. You will need to write: See lab handout if your work in done in the lab manual instead of the written report.
5. Analysis of Data
    a. All questions will need to answered THOROUGHLY in the lab handout. They will be graded on accuracy.
    b. Most questions will be discussed in class with your lab group and you may talk to me any time after school about difficult questions
6. Conclusion
    a. In paragraph format, you will discuss the results and explain WHY you got the results you did. This is where you apply the background information to the experimental results.
    b. It will also include an error analysis section and discuss any sources of error and how they could have affected the results.
7. Works Cited
    a. Use APA format to cite references. There are three sites to use to help format citations: http://citationmachine.net or http://owl.english.purdue.edu/owl/resource/560/01/. The third is not free; easybib.com.

Each lab will have its own grading rubric with a different distribution of points

AP Biology Prior Knowledge and Skills

1. General sense of the geologic history of the Earth and plate dynamics
2. Scale of the microbial world
3. General sense of the diversity of life
4. Darwin's theory of evolution provides an explanation of diversity
5. Human action can destroy habitats
6. Genomes can be manipulated by humans
2. Distinction between unicellular and multicellular organisms
3. General sense of cell structure and cell theory including major organelles and difference between prokaryotic and eukaryotic
4. Basic function of cell membrane
5. Difference between cell membrane and cell walls
6. Definitions of diffusion and osmosis
7. Mitosis, Meiosis, and the cell cycle at a summary level
8. Familiarity with light microscope
9. General sense of respiration as a system of chemical reactions catalyzed by enzymes
10. General sense of the processes involved in photosynthesis
11. Energy conservation including conversion to heat energy
12. Biological community as a system defined by a set of relationships
13. General sense of the capacity of organisms to communicate
14. Function of major organs
15. General sense of the structure of the brain and nervous system
16. The life cycle of seed-bearing plants
17. Mendelian genetics
18. The role of X and Y chromosomes in sex determination of mammals
19. Biological populations as distributions of genetic information
20. Ability to use algebra
21. Ability to construct and interpret graphs
22. Basic lab skills and knowledge of basic lab equipment
23. Reading and critical thinking skills
24. Time management
25. Organization skills

Basic Skills students entering college should have:

- Note-taking
- Familiarity with the metric system
- Ability to read and extract data from a text
- Basic math and calculator skills
- Ability to work collaboratively with peers
- Ability to engage in discussions of the curriculum
- Ability to think critically and solve problems
- Ability to differentiate between structure and function
- How to read and answer short and long response questions
- Journal reading and scientific writing skills
- Graphing skills: scale and the different types of graphical representations
- An understanding of the difference between inference and deduction
- Technology skills
- Additional expectations of the college they are attending

Lab Skills: Learned by the end of the year

1. Record data and observations properly
2. Use the correct form and content when writing lab reports
2. Formulate a hypothesis
3. Design a lab activity to test a hypothesis, including appropriate controls
4. Demonstrate the proper car and use of both a compound and dissection microscope, including oil immersion
5. Use the chi-square statistic to determine validity of data
6. Demonstrate safety and procedural techniques for working with microorganisms
7. Use a burette to perform a titration
8. Run and interpret an electrophoresis gel
9. Use properly and appropriately pipettes, graduated cylinders, and volumetric flasks
10. Use properly and appropriately a balance that is precise to least a centigram
11. Analyze and interpret data graphs and then draw conclusions

Tips for starting to write free response questions

1. Read the question carefully before writing anything.
2. Identify the question's major components. Underline key words or phrases.
3. Make a list of facts that relate to each of the components in the question.
4. Present the facts accurately and sequentially. Label each part of your answer with the corresponding letters from the question.
5. Answer the question that has been asked, not the question you would have preferred to answer.

Free Response Questions (FRQ)

Option 1: A-T-P (Attack the Prompt)

During the AP Biology exam, you are NOT required to produce a thesis statement for your FRQs. You simply have to answer what you are asked. The AP readers are looking for themes, key concepts, vocabulary and logic. Essays are NOT an option. They comprise 50% of your total score. If you have trouble answering a multiple part essay question, then try this new technique…Attack the Prompt!

12. Read the essay question. Underline all of the "to do" and action words (verbs). These action words tell you what's required.
13. Set up a sort of T-table: To do words/ Task
14. Target possible answers and briefly list the info in the t-table. Include key vocabulary terms.
15. Now, you have everything addressed. Pick the order of your response. Basically, outline how you are going to write out your essay.
16. Write out your essay… be sure to use all of your key terms.
17. Go back and make sure you addressed all key action words in your final response.
18. That's it!

Example:
Answer the following questions:

a. Propose a hypothesis regarding the effects of light on the cycle of activity of organisms.
b. Describe a controlled experiment that could be performed to test this hypothesis, and the results you would expect.

Action Words	Task
Propose	If *sunlight* is completely removed from an *ecosystem*, the overall food chain will be disrupted because sunlight is the original sources of energy for life on Earth.
Describe	Need: variables, methods, proposed results, graph, include the terms consumer, producer, photosynthesis, energy pyramid, 10% energy passed on, balance of ecosystem dependent upon decomposer and producers, cellular respiration, etc.

Now… you can write out the answer.

Option 2: Given v. Asked
Organize the information in the question into what is given and what is asked.

For example:

Answer the following questions:
Homeostatic maintenance of optimal blood glucose levels has been intensively studied in vertebrate organisms.

a. Pancreatic hormones regulate blood glucose levels. Identify TWO pancreatic hormones and describe the effect of each hormone on blood glucose levels. (4 points maximum)
b. For ONE of the hormones you identified in (a), identify ONE target cell and discuss the mechanism by which the hormone can alter activity in that target cell. Include in your discussion a description of reception, cellular transduction, and response. (4 points maximum)
c. Compare the cell-signaling mechanisms of steroid hormones and protein hormones. (4 points maximum)

Given	Asked
Blood glucose levels Vertebrate organisms Pancreatic hormones	a. 2 pancreatic hormones Describe b. Target cell reception response c. Steroid hormones to protein hormones (compare)

Now you can answer the question!

Study Tips

1. Do not procrastinate! Don't wait until the night before to study or complete a project!
2. Spend time each day reviewing what talked about in class: rewrite your notes, create an outline, add possible review questions or test questions beside the content in your notes
3. Come to class with questions about what you did not understand the day before
4. Come for tutoring
5. Find a designated place to study so you will not be distracted
6. Get a study group together either in person or over the phone
7. Skim through the chapter before we cover it in class, then go back and read the sections you did not quite understand after we talk about it in class
8. Review vocabulary: flash cards, writing out a list of vocab, concept map of vocab
9. Create a study schedule for yourself about 4 weeks before the exam to start reviewing
10. If you are unsure, just ASK!

"Studying" does not mean reading through your notes a few times before the test

Helpful Websites/Apps

1. AP Lab Bench: www.phschool.com/science/biology_place/labbench/
2. Online Textbook:

   http://wps.aw.com/wps/media/access/Pearson_Default/4929/5047666/login.html

   a. OR: www.campbellbiology.com then click on 8th edition book

   b. To login: User name= flemingap Password: biology1
3. Create flashcards online: http://memorize.com
4. Create small videos: www.animoto.com/education
5. Create interactive posters: www.edu.glogster.com
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