

## AP Biology Review

The revised AP Biology course is focused on building students' understanding of biological concepts and developing reasoning skills in a scientific laboratory setting. The AP Bio curriculum is based on four big ideas:

**Big Idea #1:** Evolution – The evolutionary process is responsible for the diversity of life.

**Big Idea #2:** Cellular Processes – Energy and communication – Biological systems use molecular building blocks and energy to maintain homeostasis, reproduce, and grow.

**Big Idea #3:** Genetics and Information Transfer – Living systems retrieve, transmit, store, and respond to information essential to life processes.

**Big Idea #4:** Interactions – Biological systems interact and possess complex properties.



### *Structural Makeup of the Exam:*

Section I – Multiple Choice (50% of the exam grade): 63 M/C questions, 6 grid-in questions = 90 Minutes

Section II – Free Response (50% of the exam grade): 6 short-response questions and 2 long-response questions = Reading Period = 10 Minutes; Writing Period = 80 Minutes

SECTION I			
Question Type	Number of Questions	Recommended Time Per Question	Total Time
Part A: Multiple Choice	63	1 Minute	90 Minutes
Part B: Grid-In	6	4 Minutes	

SECTION II			
Question Type	Number of Questions	Recommended Time Per Question	Total Time
Long Free Response	2	20 Minutes	80 Minutes + 10 Minute reading period
Short Free Response	6	6 Minutes	

### *AP Biology Laboratories: Bold labs were completed in the Fall*

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| <ol style="list-style-type: none"> <li>1. Artificial Selection</li> <li>2. Mathematical Modeling – Hardy Weinberg</li> <li>3. BLAST - Bioinformatics</li> <li>4. <b>Diffusion and Osmosis</b></li> <li>5. <b>Photosynthesis</b></li> <li>6. <b>Cell Respiration</b></li> <li>7. <b>Cell Division: Mitosis and Meiosis (done online)</b></li> <li>8. Biotechnology: Bacterial Transformation</li> </ol> | <ol style="list-style-type: none"> <li>9. Biotechnology: Restriction Enzyme Analysis of DNA</li> <li>10. Energy Dynamics</li> <li>11. <b>Transpiration</b></li> <li>12. <b>Animal Behavior</b></li> <li>13. <b>Enzyme Activity</b></li> </ol> |
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**AP Biology Review Questions:** Diagrams are helpful in explaining most of the topics! All answers must be **hand written** by EVERY group member.

These are the review questions for the entire year of AP Biology. We will complete 1-6 before the winter Final and then 7-18 during the month of April as we begin our review for the AP test. If you do a good job on questions 1-6 you can use your sheets as a review tool in the spring as well. The more time you put into studying now the less you will have to cram and the more sleep you can get before the tests!

Each group will turn in their answers together in ONE packet. Each group will be selected to teach one topic to the class. Use your notes, classwork, labs etc to make sure you understand the whole topic. I suggest that students review each topic individually before meeting as a group. This will give you time to answer questions and deepen your understanding as a group.

**Fall Final = 55 Multiple Choice Q's, 4 Grid-in problems,  
1 long free response**

Happy Studying!!!

**Question 1:**

Draw the structure and discuss the biological significance of the following macromolecules:

- a. Carbohydrates
- b. Lipids
- c. Nucleic acids
- d. Proteins

**Question 2:**

Make a schematic diagram of a generalized plant and animal cell, showing the structure of its parts as revealed by electron microscopy. Make each diagram the size of a full page and label it completely, indicating whether the cell is from a plant or animal.

List the parts included in your diagram and describe briefly the activities or functions performed by each one. Turn in with your tracking sheet –one set of diagrams/group and each list of structure/function – use the sheets in your NB to help

- What are the coordinated roles of the endomembrane system?
- Differences between plant and animal cells

**\*Turn in ONE set of cell diagrams (plant and animal) and ONE list with structure/Function for each group.**

**Question 3:**

- a. Describe the Fluid Mosaic Model of the cell membrane. Remember to include all the membrane structures and their functions.
- b. Discuss the role of the membrane in the movement of materials through it by each of the following processes: Be prepared with specific examples.
  - i. Passive Transport
  - ii. Active Transport
  - iii. Co-transport

**Question 4:**

Since biological systems utilize energy, why are enzymes so significant? Make sure to include the chemical composition and configuration of enzymes and discuss the factors that modify enzyme structure and/or function and factors that can change enzyme activity. Include graphs to help explain your answer

**Question 5:**

Explain how mitosis is responsible for maintaining genetic continuity over time while meiosis is responsible for introducing genetic variability over time. Explain how meiosis links to Mendel's laws (Law of segregation & law of independent assortment).  
-Use diagrams to describe the differences in each process

**Question 6:**

Describe the properties of water and why it is necessary for life. Explain how water is transported in plants. Explain how to calculate water potential. Part of your description must include osmosis, diffusion and tonicity concepts.

**Spring Review****Question 7:**

Explain how the molecular reactions of photosynthesis transform light energy into chemical bond energy (both cyclic and noncyclic photophosphorylation). Include in your discussion the relationship between chloroplast structure (must diagram out) and the light-dependent and light-independent reactions.

**Question 8:**

Explain how the molecular reactions of cellular respiration transform the chemical bond energy of glucose into the more readily available bond energy of ATP. Include in your discussion the structure of the mitochondrion and show how it is important to the Krebs (Citric Acid) cycle and the electron transport chain. Also include a brief overview of fermentation.

**Question 9:**

State the conclusions reached by Mendel in his work on the inheritance of characteristics. Explain how advances in molecular biology have helped us to understand the following:

- a. autosomal linkage
- b. sex-linked (X-linked) inheritance
- c. multiple alleles & polygenic inheritance
- d. epigenetics

**Question 10:**

Describe the production and processing of a protein that will be exported from a eukaryotic cell. Begin with the synthesis of messenger RNA (mRNA) from the DNA template and end with the release of the protein at the plasma membrane.

**Question 11:**

Explain evolution, including the pieces of evidence that support the theory. When describing natural selection include all factors necessary for it to occur, make sure to describe the types of selection (evolution in populations notes). Also, define speciation and ways in which it occurs. Describe the different barriers to fertilization.

**Question 12:**

Explain convergent and divergent evolution. Explain how cladograms are used to determine evolutionary relationships. Find a sample cladogram problem and explain how to complete it.

**Question 13:**

Predict the effects of genetic drift, migration, population size, and artificial selection on the genetic make-up of a population. Apply Hardy-Weinberg's two equations.

**Question 14:**

Explain how life continues to evolve within a changing environment. Discuss at least 3 ways in which humans impact the environment and therefore can affect the evolution of organisms. Include how ideas within big idea 4 can link to evolution. (Include ideas such as food webs, succession, nutrient cycles & populations). Be sure to link the concepts by essential knowledge (see handout from beginning of year)

**Question 15:**

Oops, you just contracted the flu virus. Explain what your body did when it first came into contact with the flu virus. Next explain what happened once the flu virus got past your first line of defense. Will your body get sick when you next come into contact with the flu virus? Explain why or why not.

**Question 16:**

While answering these questions for me, you notice something crawling out of the corner of your eye. Explain how you saw the movement, how you processed the information and how your body responded.

**Question 17:**

Look through the “enduring understandings” and “Essential Knowledge” standards provided by College Board. Create one in-depth question (level three on Bloom’s Taxonomy) on a topic your group needs to review. Present your question(s) and the answer.

**Question 18:**

Brainscape deck – Due by April 18th.

Your group must sign up for a deck topic and words By March 15th.

Details will be posted in google classroom