



AP Biology Summer Assignment

Overview: AP Biology is a college-level course that will require you to have a foundational knowledge of biological concepts. This summer assignment will prepare you for the course by familiarizing you with the course framework, prepping you with key vocabulary, and providing you with a real-life context of science concepts. Your summer assignment consists of three parts and will count as a project grade for the class. Everything is due the first week of school.

| | Assignment | What will be graded? | % of Project Grade | Approx. Time Needed |
|-----------------|-------------------|--|--------------------|-----------------------|
| Part I | Explore Framework | Responses to Questions | 20% | 1-2 hours |
| Part II | Vocabulary | Quiz during 1 st Week of School | 40% | 3-4 weeks of studying |
| Part III | Book Study | 1-page Reflection | 40% | 1-2 weeks of reading |

Section 1: Explore the AP Biology Curriculum Framework

Please click the following link to review the AP Biology Curriculum Framework.

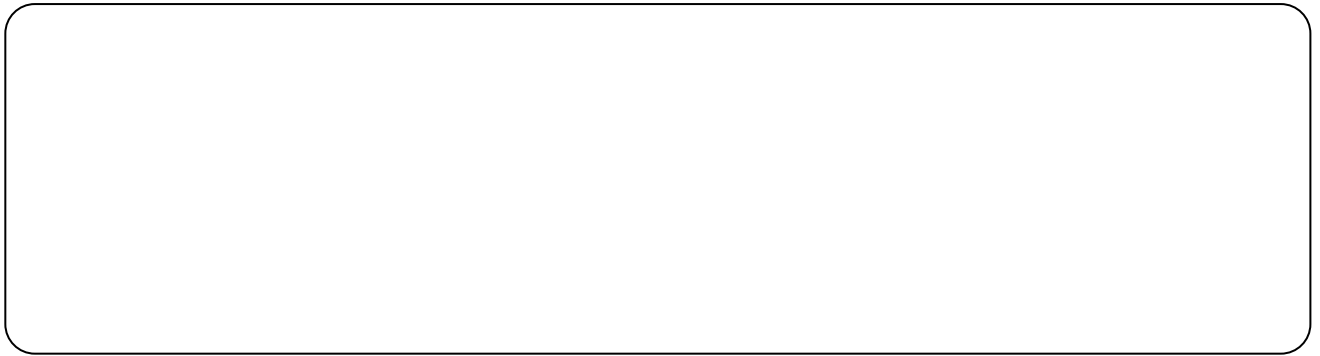
<https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-biology-course-and-exam-description.pdf>

You may print these 2 pages, or you may write your answers on your own sheet of paper.

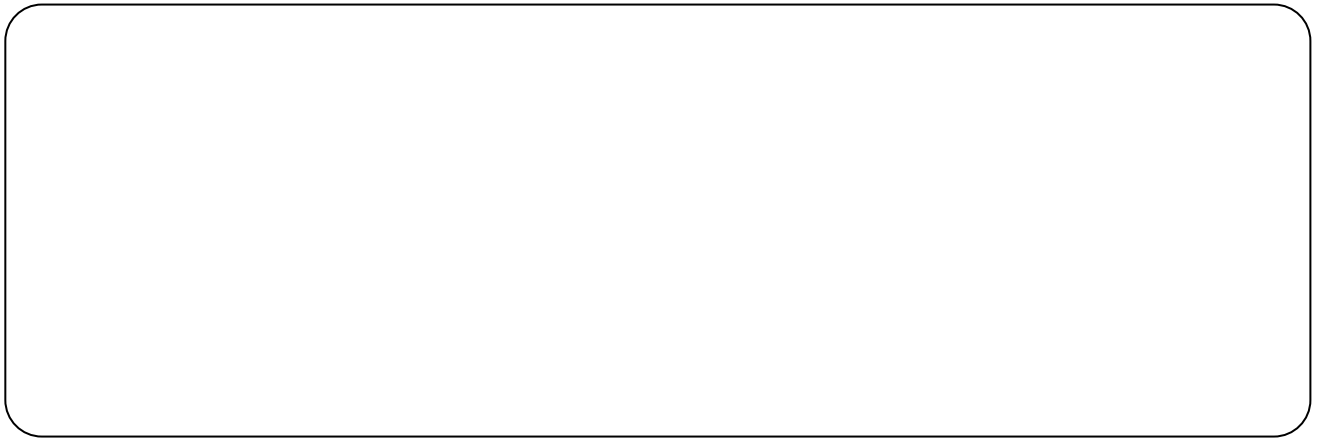
- I. Review the four Big Ideas around which the course is centered as described in the curriculum framework. Review the contents page of the curriculum framework, and identify two parts that you feel will help you be successful in the class. **Justify** your choices.

- II. Answer the following questions:
 1. When material is marked with an **X**, what does this mean?

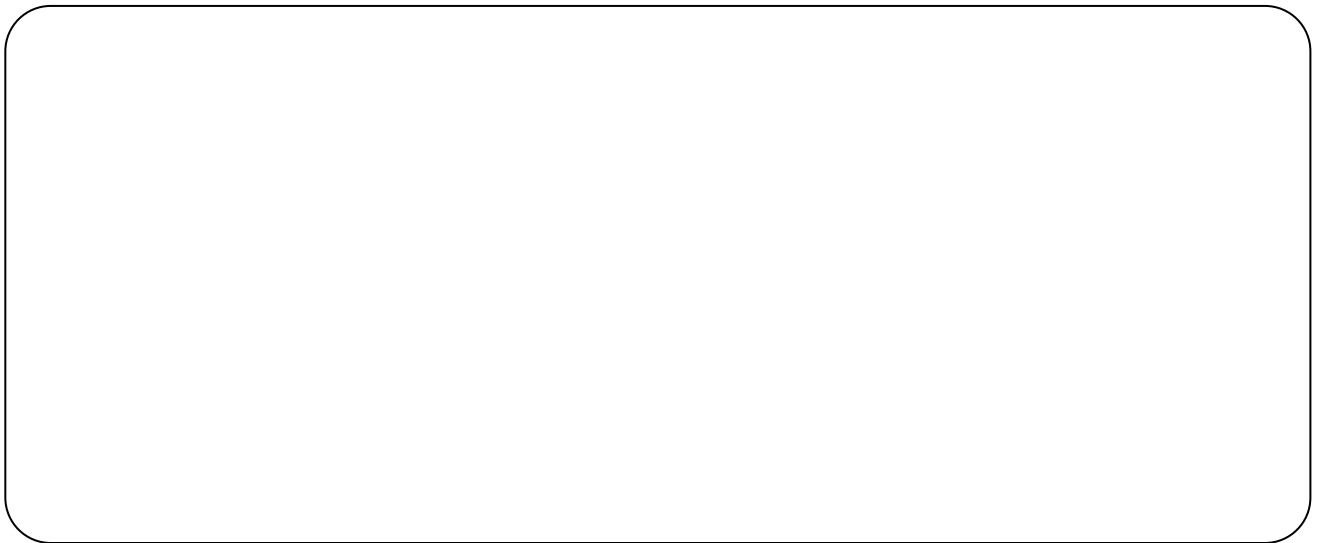
2. How many Essential Knowledges does each Big Idea contain?



3. What is the difference between an Essential Knowledge and a Learning Objective?



4. Based on your review of the course requirements, do you feel AP Biology is more factual or conceptual? Justify your answer with specific references from the framework.



Section 2: Essential Vocabulary

Below is a list of basic vocabulary terms that you need to know by the beginning of the course. You will be tested on these terms within the first week of school. You should be able to identify examples and use the vocabulary terms in context. Memorizing definitions will not be sufficient!

Experimental Design

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|-------------------------|-------------------------|-------------------|
| 1. Positive Control | 4. Dependent Variable | 7. Hypothesis |
| 2. Negative Control | 5. Manipulated Variable | 8. Model Organism |
| 3. Independent Variable | 6. Responsive Variable | |

Unit 1: Chemistry of Life

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|-------------------|-----------------|------------------|-------------------|
| 1. Amino Acid | 5. Carbohydrate | 9. Fatty Acid | 13. Monomer |
| 2. Protein | 6. Nucleotide | 10. Phospholipid | 14. Polymer |
| 3. Monosaccharide | 7. Nucleic Acid | 11. Hydrolysis | 15. Macromolecule |
| 4. Disaccharide | 8. Lipid | 12. Denaturation | 16. Enzyme |

Unit 2: Cell Structure and Function

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|----------------------|--|---|
| 1. Prokaryote | 7. Facilitated Diffusion | *You should also know cellular organelles (nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, Golgi Body, Endoplasmic Reticulum, vacuole, ribosome, and mitochondria). |
| 2. Eukaryote | 8. Endocytosis | |
| 3. Homeostasis | 9. Exocytosis | |
| 4. Active Transport | 10. Concentration Gradient | |
| 5. Passive Transport | 11. Selective Permeability | |
| 6. Osmosis | 12. Tonicity (hypertonic, isotonic, hypotonic) | |

Unit 3: Cellular Energetics

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|-------------------------|------------------------------|------------------|
| 1. Photosynthesis | 5. Krebs Cycle | 9. Calvin Cycle |
| 2. Cellular Respiration | 6. Electron Transport Chain | 10. Aerobic |
| 3. ATP/ADP Cycle | 7. Glycolysis | 11. Anaerobic |
| 4. Carbon Cycle | 8. Light-Dependent Reactions | 12. Fermentation |

Unit 4: Cell Cycle

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|---------------------|--------------|--------------------|
| 1. Mitosis | 5. Prophase | 9. Cytokinesis |
| 2. Nuclear Division | 6. Metaphase | 10. Binary Fission |
| 3. Cell Cycle | 7. Anaphase | 11. Diploid |
| 4. Somatic Cell | 8. Telophase | 12. Chromosome |

Unit 5: Heredity

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|---------------------------|---------------|--------------------------|
| 1. Meiosis | 9. Autosomes | 17. Homozygous |
| 2. Crossing Over | 10. Phenotype | 18. Heterozygous |
| 3. Point Mutation | 11. Genotype | 19. Gamete |
| 4. Homologous Chromosomes | 12. Trait | 20. Sexual Reproduction |
| 5. Mutagens | 13. Allele | 21. Asexual Reproduction |
| 6. Genetic Variation | 14. Haploid | 22. Zygote |
| 7. Nondisjunction | 15. Dominant | |
| 8. Fertilization | 16. Recessive | |

Unit 6: Gene Expression and Regulation

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|-----------------------|----------------|-----------------------|
| 1. DNA | 8. Translation | 15. tRNA |
| 2. RNA | 9. Gene | 16. rRNA |
| 3. Double Helix | 10. Amino Acid | 17. Protein Synthesis |
| 4. DNA Replication | 11. Codon | 18. Complementary |
| 5. Nitrogenous Bases | 12. Anticodon | 19. Polypeptide |
| 6. Base-Pairing Rules | 13. mRNA | 20. DNA Mutation |
| 7. Transcription | 14. Ribosome | |

Unit 7: Natural Selection

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|---------------------------|--------------------------|---------------------------|
| 1. Evolution | 7. Analogous Structures | 13. Adaptation |
| 2. Natural Selection | 8. Homologous Structures | 14. Speciation |
| 3. Acquired Traits | 9. Embryology | 15. Fitness |
| 4. Population | 10. Fossil Record | 16. Gene Pool |
| 5. Species | 11. Vestigial Structures | 17. Biological Resistance |
| 6. Comparative Morphology | 12. Genetic Drift | 18. Allele Frequency |

Unit 8: Ecology

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|-------------------------|---------------------|----------------------|
| 1. Symbiosis | 11. Fungi | 21. Food Web |
| 2. Endosymbiotic Theory | 12. Archaeobacteria | 22. Consumer |
| 3. Taxonomy | 13. Eubacteria | 23. Decomposer |
| 4. Cladogram | 14. Plantae | 24. Trophic Level |
| 5. Phylogenetic Tree | 15. Heterotroph | 25. Energy Pyramid |
| 6. Virus | 16. Autotroph | 26. Keystone Species |
| 7. Biotic | 17. Kingdom | 27. Global Warming |
| 8. Abiotic | 18. Domain | 28. Invasive Species |
| 9. Animalia | 19. Virus | 29. Biomass |
| 10. Protista | 20. Ecosystem | 30. Biodiversity |

Section 3: Book Study

Choose **ONE** of the books listed below:

- *Your Inner Fish*, Neil Shubin
- *The 6th Extinction*, Elizabeth Kolbert
- *Serengeti Rules*, Sean B. Carroll
- *Silent Spring*, Rachel Carson
- *The Demon in the Freezer*, Richard Preston
- *The Hot Zone: The Terrifying True Story of the Origins of the Ebola Virus*, Richard Preston

All of these books are available for purchase online and range in price from \$8-\$15, or you can get a copy from your local library. You are not required to bring your copy of the book to class with you! 😊

Write a **one-page, single-spaced** reflection that shows evidence of comprehension of your chosen book.

Please read the book and write an honest reflection! Do not plagiarize this assignment!!!

There will be a follow-up activity during the first week of school, and it will be obvious if you did not read.

Be sure to include the following:

- Title and Author of your book. What was the author's purpose in writing this book?
- Give an overall summary of your book. To which of the 4 Big Ideas of AP Biology does this book relate?
- Discuss how your viewpoints have changed or strengthened while reading your book.
 - Is there anything new you learned that you are excited to learn more about this year?
 - Are there any topics mentioned that you didn't quite understand?
 - Can you think of a current or recent event that relates to the book?