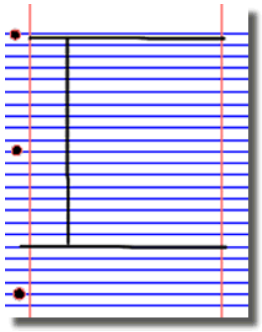
AP Biology Homework Guidelines:

ALL Homework should be saved in a notebook that can be used later as a resource to study for the AP Biology Exam

Possible Homework Strategies and Descriptions:



1. Cornell Notes: Divide paper as shown in diagram to the right. Notes go in the top right box (Don't use complete sentences – diagrams and concept maps are welcome), key points go in the top left, a summary of information goes on the bottom (this should be done in complete sentences).
2. Guided Readings: Each student will answer a set of questions based on information from the textbook.
3. Concept Mapping: Each student will create a concept map about main themes of each chapter. Making connections and relationships from the information given.
4. Traditional Outlines: Each student will read the chapter and generate an outline based on information in the chapter
5. MasteringBiology.com: Each student will log on using their student accounts and answer questions regarding the chapter we are discussing in class.

For ALL Strategies: Please read each through the chapter once. Consider taking notes and drawing diagrams or concept maps. Think about what you have read and follow that up by answering the following questions completely, in detail and in your own words.

GRADING: Please note the due date for each assignment. You are to summit your work on the day it is due. You will receive zero credit for any late work (refer to syllabus for policies.) All work submitted must be your own. You may not collaborate with others on homework or use words that are not your own. If you need to quote the text, include the proper citations. If you choose not to follow the Academic Honor Code proper action will be taken.

Chapter 25 – Early Earth and the Origin of Life

Due – 12/19

1. Explain how the histories of Earth and life are inseparable.
2. Describe the major events in Earth's history from its origin up to about 2 billion years ago. In particular, note when Earth first formed, when life first evolved, and what forms of life existed up until about 2 billion years ago.
3. Describe the timing and significance of the evolution of photosynthesis.
4. Describe the timing of key events in the evolution of the first eukaryotes and later multicellular eukaryotes.
5. Describe the timing of key evolutionary adaptations as life colonized land.
6. Describe the contributions that A. I. Oparin, J. B. S. Haldane, and Stanley Miller made toward developing a model for the abiotic synthesis of organic molecules. Describe the conditions and locations where most of these early organic reactions probably occurred on Earth.
7. Describe the evidence that suggests that RNA was the first genetic material. Explain the significance of the discovery of ribozymes.
8. Describe how natural selection would have worked in an early RNA world.
9. Describe the evidence that suggests that life first evolved on the sea floor near deep-sea vents.

Chapter 26 – Phylogeny and Systematics

Due – 12/22

1. Describe the process of sedimentation and the formation of fossils. Explain what portions of organisms mostly fossilize and why.
2. What types of organisms are most likely to appear in the fossil record?
3. Marsupials evolved in what is now North America, yet their greatest diversity is found in Australia. How can you account for this biogeographic distribution?
4. Why do extensive adaptive radiations often follow mass extinctions?
5. Explain how species are named and categorized into a hierarchy of groups. What are the major taxonomic categories?
6. Define the parts and describe the interrelationships within a cladogram. Explain how a cladogram is constructed.
7. Distinguish between homologous and analogous structures. Explain why the similarity of complex systems implies a more recent common ancestor.
8. Compare the cladistic and phylocode classification systems.

Chapter 22 – Descent with Modification: A Darwinian View of Life
Due – 1/5

1. Describe how Darwin used his observations from the voyage of the HMS *Beagle* to formulate and support his theory of evolution.
2. Describe the three inferences Darwin made from his observations that led him to propose natural selection as a mechanism for evolutionary change.
3. Explain why the population is the smallest unit that can evolve.
4. Using some contemporary examples, explain how natural selection results in evolutionary change.
5. Explain how homologous structures support Darwin's theory of natural selection. Explain how biogeography and the fossil record support the evolutionary deductions based on homologies.

Chapter 23 – The Evolution of Populations
Due – 1/6

1. Explain why it is incorrect to say that individual organisms evolve.
2. Define a population; define a species.
3. State the Hardy-Weinberg theorem and write the general Hardy-Weinberg equation
4. List the conditions a population must meet to maintain Hardy-Weinberg equilibrium.
5. Explain how genetic drift, gene flow, mutation, nonrandom mating, and natural selection can cause microevolution.
6. Distinguish between the bottleneck effect and the founder effect.
7. Define polymorphism and morphs. Describe an example of polymorphism within the human population.
8. Explain why even though mutation can be a source of genetic variability, it contributes a negligible amount to genetic variation in a population
9. Describe the cause of nearly all genetic variation in a population.
10. Distinguish between Darwinian fitness and relative fitness.
11. Describe the advantages and disadvantages of sexual reproduction.
12. Describe at least four reasons why natural selection cannot breed perfect organisms.

Chapters 24 – The Origin of the Species
Due – 1/12

1. What is the difference between prezygotic and postzygotic isolating mechanisms?
2. Define and distinguish among each of the following: ecological species concept, pluralistic species concept, morphological species concept, and genealogical species concept.
3. Distinguish between allopatric and sympatric speciation.
4. What is the role of intraspecific variation and geographic isolation?
5. What is adaptive radiation? How does this occur on island chains?
6. How do reproductive barriers evolve?
7. Define sympatric speciation and explain how polyploidy can cause reproductive isolation.
8. What is the difference between an autopolyploid and an allopolyploid species? Describe examples of each.
9. List some points of agreement and disagreement between the two schools of thought about the tempo of speciation (gradualism versus punctuated equilibrium). .
10. Define evo-devo, allometric growth, heterochrony, and paedomorphosis.

***Evolution Labs:**

Lab #3 – Comparing DNA Sequences – 12/23 and during break
Lab #2 – Mathematical Modeling – 1/7-1/9

***Unit Test – Evolution –** 1/14

**Dates subject to change*