

AP Biology Summer Assignment

Ms. Chulapatrcheevin
vchulapatrcheevin@tustin.k12.ca.us

Hello lovely students! Welcome to AP Biology. To prepare for the rigor of the year ahead you will be completing the following assignments. Remember, biology is about approaching the study of life with curiosity, and seeing the complexity, mystery and beauty of the natural world. Enjoy your assignments, have some fun, and don't wait until the end of August!

All parts of your summer assignment are due the second day of class: August 22, 2017.

Part I: Read Chapters 1, 22, 23, and 24 in Campbell's *Biology* textbook. Complete the attached study guide. Be prepared for an assessment and discussion on the first day of class. You will find an online textbook and additional resources at: <https://tusd.haikulearning.com/vchulapatrcheevin/apbiologyfhs>

Part II: Biology Scavenger Hunt

Listed below are over 100 terms critical to the AP Biology curriculum. You must select **75 terms** for your digital scavenger hunt. For each term selected you need to take an original photograph, define the term, and explain how your photo illustrates the function of the vocabulary term. Your work must be specific and detailed. You will submit your photos as a digital file via Haiku (PowerPoint or .PDF is ideal, but Word, Prezi, or other digital format will be accepted).

Requirements:

Original Pictures Only: you must take the photo yourself; do not use an image from any publication or the web; do not share images with classmates. Each image must include you or a unique personal item (like your sibling, or a knick-knack) to confirm its authenticity.

Real/Natural Items Only: walk around your yard, neighborhood, and town; research what the term means and in what organisms it can be found and then go out and find one!

For Each Vocabulary Term: provide the definition and a detailed explanation of the significance of the term.

Part III: Bonus Assignment (optional)

Choose one or more of the following, each written response should be at least one page, single spaced.

1. Go to the tide pools/snorkeling /scuba diving. Take a photo of yourself. Take photos of 5 organisms and explain the limiting factors that might affect them, their special adaptations, and in which tidal zone they would be found.
2. Visit a zoo/botanical garden/aquarium. Attach ticket stub and take a picture with a sign to show evidence you were there. Take pictures of 5 different animals/plants there and describe the biome in which they live in and any special characteristics/adaptations they have.
3. See a science movie (science fiction is fine). Attach the ticket stub and take a photo of you being there (or in front of your TV). Describe 5 science themes you were able to find while watching the movie.
4. Explore your backyard/neighborhood. Take a photo with 5 plants/animals that are native to southern California. Discuss the organisms' adaptations and where you found them. How do you know they are native species?
5. Go on a nature hike (*suggestions: Peter's Canyon, Irvine Regional, Crystal Cove, etc.*) Take a photo with a sign to show that you were there. Take pictures of 5 different plants/animals you see. Write about your hike. You should discuss the biome in which you are in and any characteristics, special adaptations you find in the plants/animals. See anything interesting? What trails did you go on? Did you get lost?

AP Biology Vocabulary Terms:

actin	exothermic reaction	modified root
action potential	endosperm	mutualism
activation energy	enzyme	niche
adaptation of an animal	epithelial	natural selection
adaptation of a plant	exoskeleton	obligate aerobe
adhesion	ecosystem	obligate anaerobe
adipose tissue	electromagnetic	organic acid
agonistic behavior	estivation	osmoregulation
allele	evaporative cooling	oxidation
amniotic egg	eutrophication	parasite
amylase	fermentation	protist
anther	fat-soluble vitamin	pollinator
antigen	fixed-action pattern	protein – fibrous
apical meristem	fungus	protein – globular
autotroph	gametophyte	penicillin
bacteria	gastropod	phloem
barrier defense	genetically modified organism	phototropism
Batesian mimicry	genetic variation	pigments – accessory
behavioral isolation	gymnosperm	R-strategist
benthic zone	hermaphrodite	radial symmetry
biological magnification	haploid chromosome #	scrapie
beta-carotene	habitat isolation	saturated fatty acid
C-4 plant	hemizygous gene	secondary consumer
cellulose	heterotroph	segmentation
chitin	homeostasis	sexual dimorphism
conifer	host organism	sugar sink
commensalism	hydrophobic	taxis
connective tissue	inflammation	thermoregulation
camouflage	incomplete dominance	twins
catabolic	integumentary system	uniformitarianism
competition	introduced species	vertebrate
conservation	K-selected	– cold blooded
deciduous plant	keratin	vertebrate
dicot flower	kinetic energy	– warm blooded
decomposer	lichen	wing
denaturation	leaf abscission	xerophyte
echinoderm	littoral zone organism	
ectotherm(ic)	modified leaf	

AP Biology Evolution Study Guide

Chapter 22: Darwinian View of Life

1. What is the definition of evolution? Give both the broad and the more narrow definitions.
2. How did the following sources view the origin of species?
 - a. Aristotle and Scala Naturae
 - b. Carolus Linnaeus
3. Describe Linnaeus' classification system.
4. How did Lyell's and Hutton's ideas influence Darwin's thinking about evolution?
5. How did Lamarck's view of the mechanism of evolution differ from Darwin's? Which two principles of his were refuted? What aspects of his ideas were important?
6. What book did Darwin publish in 1859? What did Darwin propose was the mechanism of evolution? Explain.
7. What is artificial selection and how did it influence Darwin's ideas?
8. Summarize Darwin's two observations:
 - a. Observation #1:
 - b. Observation #2:
9. Now, summarize the two inferences Darwin drew from his observations:
 - a. Inference #1:
 - b. Inference #2:
10. Complete the following sentences. Memorize this key idea!

_____ do NOT evolve. _____ evolve.

11. There are four evidences for evolution. List, explain, and provide an example for each.

Evidence for Evolution	Explanation	Example

12. Define each of the following terms. Provide an example of each.
 - a. Homologous structures
 - b. Vestigial structures
 - c. Analogous structures
13. What is summarized in an *evolutionary tree*?
14. Contrast common descent vs. convergent evolution. What evidence supports each?
15. What is biogeography? How is it affected by *continental drift* and the presence of *endemic species*?

Chapter 23: Evolution of Populations Reading Guide

1. What is microevolution?
2. Several sources of genetic variation are available. What is the ultimate source of new genes and alleles?
3. Review: What are the three mechanisms that contribute to genetic variation in sexual reproduction?
4. Define the following:
 1. Population
 2. Gene pool
 3. Fixed allele
5. What is the Hardy-Weinberg principle?
6. What are the Five Conditions for Hardy-Weinberg Equilibrium?
7. What occurs if at least one of the five conditions of Hardy-Weinberg equilibrium are not met? How commonly does this occur?
8. What are the three major factors that can cause changes in allele frequencies? Briefly explain each.
9. Explain what happens in each of these examples of *genetic drift*:
 1. Founder effect
 2. Bottleneck effect
10. There are three modes of natural selection. Explain and provide an example for each mode.

Type of Selection	Explanation	Example
Directional		
Disruptive		
Stabilizing		

11. What is often the result of sexual selection?
12. Contrast *intrasexual selection* vs. *intersexual selection*. Give an example of each.
13. Explain two ways in which genetic variation is preserved in a population.
14. What is meant by *heterozygote advantage*? Use sickle-cell anemia as an example.
15. Give four reasons why natural selection cannot produce perfect organisms.

Chapter 24: The Origin of Species

1. What is the difference between *microevolution* and *macroevolution*?
2. Define the biological species concept.
3. What is *reproductive isolation*?
4. Compare prezygotic to postzygotic reproductive barriers.
5. For the following examples, indicate the type of reproductive isolation and whether it is a prezygotic barrier or a postzygotic barrier.

Type of Isolation	Pre- or Post-	Example
		Two species of frogs mate in a laboratory setup and produce viable but sterile offspring.
		Two species of sea urchins release gametes at the same time, but the sperm fail to fuse with eggs of a <u>different species</u> .
		The genital openings of two species of land snails cannot line up because their shells spiral in <u>opposite directions</u> .
		Two species of short-lived mayflies emerge during different weeks in spring.
		Two species of salamanders mate and produce offspring, but the hybrid's offspring are sterile.
		Two similar species of birds have different mating rituals.
		Embryos of two species of mice bred in the lab usually abort.
		Peepers breed in woodland ponds; leopard frogs breed in swamps.

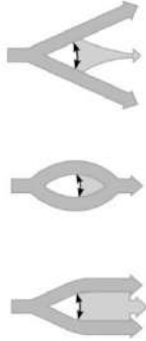
6. What are some examples of situations when the biological species concept does not apply?
7. Fill in the following table to review four of the approaches that biologists have proposed for conceptualizing a species.

Concept	Emphasis
Biological	
	Anatomical differences, most commonly used
	Unique roles in specific environments
Phylogenetic	

8. Compare *allopatric* and *sympatric* speciation. How might reproductive barriers arise in each type of speciation?
9. How can autopolyploid or allopolyploid chromosomal changes lead to sympatric speciation?
 - a. A new plant species B forms by autopolyploidy from species A, which has a chromosome number of $2n=10$. How many chromosomes would species B have?
 - b. If species A were to hybridize with species C ($2n=14$) and produce a new allopolyploid species D, how many chromosomes would species D have?
10. Use the following diagrams to explain the three possible outcomes for a *hybrid zone* over time. List an example of each outcome.

Explanation:

Example:



11. Compare *punctuated equilibrium* and *gradualism*.