AP Biology Natural Selection Unit 7 HW Sheet
Test Date: _____
Extra Homework Resources: Campbell Text Chapters: 21-24, 26

Lesson 1: Natural Selection Mechanism and Evidence
To begin with, read Chapter 18, Section 1 in the OpenStax book: https://openstax.org/books/biology-ap-courses/pages/18-1-understanding-evolution, then go to http://evolution.berkeley.edu/evolibrary/article/evo_01 and click on "An Introduction to Evloution."

1. Describe what "Descent with Modification" is and what it isn't. What do you think that descent with modification have to do with evolution/natural selection?

2. This page describes "Microevolution." Based on context, what do you think "Microevolution" means?

3. Click "next" and describe the relationship between natural selection and classification.

Click on "Mechanisms" and read the subpages from "Descent with modification" through "What about fitness?" under it from the toolbar on the left of your screen. Use these pages to answer the following:
4. Using the beetles example, describe (in your own words) the mechanisms by which natural selection (evolution) works.

a.

b.

c.

d.

5. What is meant by "fitness?"

Use the Powerpoint for this unit and watch the first 7:42 minutes of the video at https://www.khanacademy.org/science/biology/crash-course-biology-science/v/crash-course-biology-113 to help you answer the following:

6. Fill out the chart below:

Evidence for Natural Selection	**How it works?/Description**	**What does it tell evolutionary biologists?**
Different sized finch beaks		
Anatomical Features		
Biogeography		
	Organisms DNA is compared	
		Organisms like bacteria can be observed as they evolve

Lesson 2: Variations on Natural Selection

1. Read Chapter 19, Section 3 in the OpenStax book: https://openstax.org/books/biology-ap-courses/pages/19-3-adaptive-evolution. Then, watch the remainder of the video at https://www.khanacademy.org/science/biology/crash-course-biology-science/v/crash-course-biology-113 to help you fill out the chart below:

Variation on Natural Selection	**How it works**	**Examples**
		Dark colored peppered moths became favorable over time
	The “middle” phenotypes are favored over the others	
Disruptive Selection		
	Phenotypes that are attractive or ensure defeat of a rival are favored	
Artificial Selection		

Go Back to http://evolution.berkeley.edu/evolibrary/article/evo_01 and click on “Mechanisms.” Read the remaining sections from “Sexual Selection” onward under “Mechanisms” to help you answer the following

2. In addition to what you learned in the video from #1, name 2 examples of traits that are most likely shaped by sexual selection and why you think so.

a.

b.

3. Is “Female Choice” always a choice? Justify your answer in 1 sentence.

4. Describe adaptation in your own words. What is the source of new adaptation?

5. Describe one of the misconceptions about Natural Selection.

6. Define “Coevolution” in your own words. Do a google search on “The Red Queen Hypothesis” and describe how these concepts relate to one another to shape evolutionary changes in species.

8. Distinguish between convergent and divergent evolution.

Lesson 3: Population Genetics and Preserving Genetic Diversity

Read Chapter 19, Sections 1 and 2 in the OpenStax book, starting at: https://openstax.org/books/biology-ap-courses/pages/19-1-population-evolution. Then, watch the video at https://www.khanacademy.org/science/biology/crash-course-biology-science/v/crash-course-biology-117 to help you answer the following questions.

1. Describe, in your own words, the 5 factors that change the genetic makeup of populations

2. What is the purpose of the Hardy-Weinberg equation and how does/doesn’t it relate to the 5 factors you listed in #1 with respect to Hardy-Weinberg equilibrium?

3. Pause the video before the earwax segment and find the H-W equation in the class power point or in class work. What is the relationship between the terms in the equation (2pq for example), phenotypes, and genotypes in the population?

4. Continue to play the video. Why is p+q=1 important? How does it relate to the H-W equation?

5. In a population of black and white bunnies, Black (B) is the dominant allele and has a frequency of .65. What is the frequency of white bunnies in the population? Show your work!

Lesson 4: Speciation and Earth's Geologic History

Read Chapter 18, sections 2 and 3 in the OpenStax Book, starting at https://openstax.org/books/biology-ap-courses/pages/18-2-formation-of-new-species. Then watch the video at https://www.khanacademy.org/science/biology/crash-course-biology-science/v/crash-course-biology-114 to help you to answer the following questions

1. Define "Species." How is a species different from a "hybrid?"

2. Speciation means "making new species." In order to have speciation, what must happen first?

3. Distinguish between the following pairs:

    a. Prezygotic and Postzygotic Isolating Mechanisms

    b. Allopatric and Sympatric Speciation

4. Darwin wrote of speciation, "Natura non facit saltum," which translates to "Nature doesn't jump." What did he mean by that and describe whether or not he was right.

Go to http://evolution.berkeley.edu/evolibrary/article/evo_01 and click on "Speciation." Read through the sub-sections that pop up under "Speciation" to answer the following questions:

5. Define "Gene flow" and describe how it impacts speciation.

6. Describe in your own words how cospeciation works.

Lesson 5: Classification

Read Chapter 20 in the OpenStax Textbook: https://openstax.org/books/biology-ap-courses/pages/20-introduction. Then watch the video at https://www.youtube.com/watch?v=F38BmgPcZ_I and use the information to answer the following:

1. Why is taxonomy like the “Dewey Decimal System” of Evolutionary Biology?

2. What are the steps in the hierarchical classification system? Relate the terms taxa and taxon to this system.

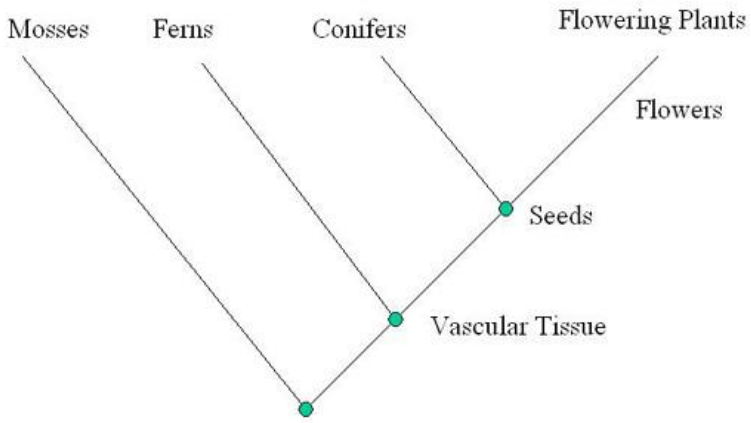
3. What were Carolus Linnaeus’ major contributions to classification?

4. What’s the difference between “old school” and “new school” classification? Think in terms of number of steps in the system as well as the evidence that we use to classify organisms.

5. It is said that when you look at a scientist’s work with classification, you’re looking at a hypothesis. What about classification makes this work hypothetical?

7. Play with the interactive at http://www.pbs.org/wgbh/nova/nature/classifying-life.html and answer: Have we completely abandoned morphology when classifying orgganisms? Justify your answer.

8. Distinguish between phylogenetic trees and cladograms. Take a look at the simple plant cladogram below. What are the derived characters of the major groups of plants?



Lesson 6: AP Progress Check

Log in to your AP Classroom account and complete the Progress Check: MCQ (Note: This assignment will not open for you until 2 class days before the Unit test)