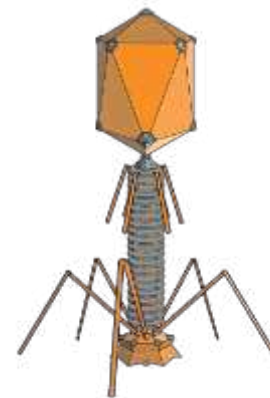


Advanced Placement Biology

SUMMER ASSIGNMENT

ALL assignments are DUE on the first day of school:

August 11th, 2014



Part 1: Class Materials and Organization



*Class Binder: Purchase one 1 or 1 1/2 inch 3-ring binder for all course materials. The outside cover should be labeled with your NAME and AP BIOLOGY. You should bring your class notebook with you on the first day of class.

***Lab Notebook:** Purchase a composition notebook. The notebooks with grid lines or half of the page has grid lines are preferred.

***4 function calculator** with square root function (\$1-\$5). For more information, see the College Board rules:

<https://apstudent.collegeboard.org/apcourse/ap-biology/calculator-policy>



Part 2:

1. You should have already joined the edmodo group for this summer assignment. If you have received this packet in any other way, join the edmodo group by going here: <https://edmo.do/j/wxkddq>
2. Read the **syllabus** that is posted on Edmodo. Print and get the signature sheet signed.
3. Read the College Board AP Biology course description (<http://media.collegeboard.com/digitalServices/pdf/ap/ap-biology-course-and-exam-description.pdf>). Take a look at the formula sheet that you are allowed to use on the AP test (http://media.collegeboard.com/digitalServices/pdf/ap/bio-manual/Bio_AppendixA-APBiologyEquationsandFormulas.pdf). Some of the questions in the following problem set use these formulas.
Please note that you will need certain plug-ins to view/print handouts and multimedia files.

Part 3:

1. **Read chapters 1, 2, 52, 53, 54** thoroughly using the eText. To access the eText:
 - a) Go to <http://www.masteringbiology.com/site/login.html>
 - b) **Enter User: ---, and password: --- LOGIN to EDMODO for the username and password.**
 - c) Choose the “eText” link on the top menu.
 2. Complete the questions in the problem set below for each chapter.
 3. *Study* each of the 5 chapters thoroughly. Use the “study area” on the website above to help you study.
- Take the “Practice Test”** found at the bottom of each online chapter page.

****Important: These chapters will NOT be covered in class. The information in these chapters is considered to be prerequisite knowledge for entrance into AP Biology. Therefore, you will be responsible for the understanding of these chapters on your own. The first unit test will cover these chapters and will be on the first Friday of class, August 15, 2014.**

If you have any questions regarding the assignments, you can email me over the summer at wolfed@fultonschools.org and I will do my best to get back to you in a timely manner regarding your questions.

Thank you. Have a great summer!
D. Wolfe

DO NOT WRITE ON THIS PAGE.

KEEP THE PREVIOUS ASSIGNMENT PAGE FOR YOUR REFERENCE.

TURN IN ONLY THE PAGES THAT FOLLOW

Name: _____

AP BIOLOGY

AP Course Description

Read the Course Description: <http://media.collegeboard.com/digitalServices/pdf/ap/ap-biology-course-and-exam-description.pdf>

1. List each of the BIG ideas **AND** describe how YOU THINK it applies to this class.

a)

b)

c)

d)

CHAPTER 1: EXPLORING LIFE

2. What are the seven properties of life?

a) _____

b) _____

c) _____

d) _____

e) _____

f) _____

g) _____

3. Diagram the hierarchy of levels of biological organization from molecule to biosphere.

4. Why do Biology courses build their content around themes and major concepts?

5. Explain what is meant by "form fits function."

6. What is the primary model for regulation?

7. List and give an example of the three domains.

a) _____

b) _____

c) _____

8. Distinguish between inductive and deductive reasoning.

9. How does biology account for the unity and diversity of life?

10. What is a *controlled experiment*? Give a description of a controlled experiment.

11. Answer the following questions about David Pfennig's experiment with coral snakes (Figure 1.27):

a) What was the independent variable? _____

b) What was the dependent variable? _____

c) Explain the difference between the experimental group and control group in this experiment?

d) What was their conclusion?

12. What is meant by the statement that science is a process?

CHAPTER 2: THE CHEMICAL CONTEXT OF LIFE

1. Define the following in the spaces provided:

- a) matter - _____
- b) element - _____
- c) compound - _____
- d) molecule - _____
- e) atom - _____
- f) neutron - _____
- g) proton - _____
- h) electron - _____
- i) Atomic number - _____
- j) Mass number - _____
- k) valence electron - _____
- l) valence shell - _____
- m) Trace element - _____
- n) orbital - _____
- o) non-polar covalent bond - _____
- p) polar covalent bond - _____
- q) structural formula - _____
- r) molecular formula - _____
- s) ion - _____
- t) cation - _____
- u) anion - _____
- v) hydrogen bond - _____
- w) isotope - _____
- x) London Dispersion forces (a type of van der waals interaction) - _____
- y) Radioactive isotope - _____
- z) chemical reaction - _____
- aa) Potential energy - _____
- bb) chemical equilibrium - _____
- cc) Energy level - _____
- dd) Electron shell - _____

2. What are the most common elements in humans?

3. Nitrogen has an atomic number of 7 and atomic mass of 14. Explain.

4. List and describe some examples of isotopes used in Biology.

5. What happens when electrons change levels?

6. What is the significance of valence numbers?

7. Why do atoms form covalent vs. ionic bonds?

8. How do non-polar covalent bonds differ from polar covalent bonds?

9. What is a hydrogen bond? How does it form and how is it different from a covalent bond?

10. Draw a few water molecules. Label the bonds between the atoms within the molecule and the intermolecular forces between water molecules.

11. The following dissolved oxygen (DO) readings were taken by different groups of students from the retention pond at the ARCH (behind the school). Find the standard deviation for their readings. Use the AP Biology Formula sheet (http://media.collegeboard.com/digitalServices/pdf/ap/bio-manual/Bio_AppendixA-APBiologyEquationsandFormulas.pdf) **SHOW YOUR WORK!**

ARCH DO (mg O₂ / L)

4.20	4.90	3.70	3.20	8.40	3.40	3.60	4.80
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CHAPTER 52: An Introduction to Ecology and the Biosphere

1. Contrast the terms *ecology* and *environmentalism*. How does ecology relate to environmentalism?

2. What environmental issue was targeted in Rachel Carson's book, *Silent Spring*? What was the outcome of her efforts?

3. What is *biogeography*? What factors determine the distribution of organisms?

4. List and describe five examples of biotic factors.

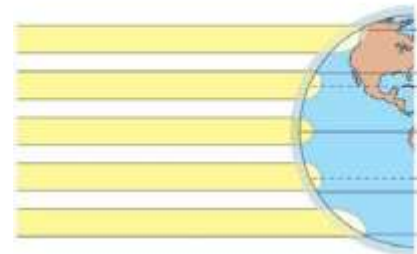
- a) _____
- b) _____
- c) _____
- d) _____
- e) _____

5. List five abiotic factors. Include an example and description of each factor's influence on living organisms.

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____

6. What is climate? What abiotic factors are its components?

7. Explain how Earth's curvature and axis of rotation influence the amount of sunlight reaching a given area, and how these factors influence the temperature and precipitation in that area.



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8. Explain the “rain shadow effect”.

9. What effect does elevation have on climate? For instance, the country Nepal is at the same latitude as Florida. In the plains of Nepal, there are sub-tropical forests; however, Mt. Everest has a much different climate.

10. What is a biome?

11. What is the largest marine biome and how much of the earth's surface does it cover?

12. Distinguish between each of the following terms.

a) photic / aphotic - _____

b) benthic / pelagic - _____

c) oligotrophic / eutrophic - _____

d) littoral / limnetic - _____

e) zooplankton / phytoplankton - _____

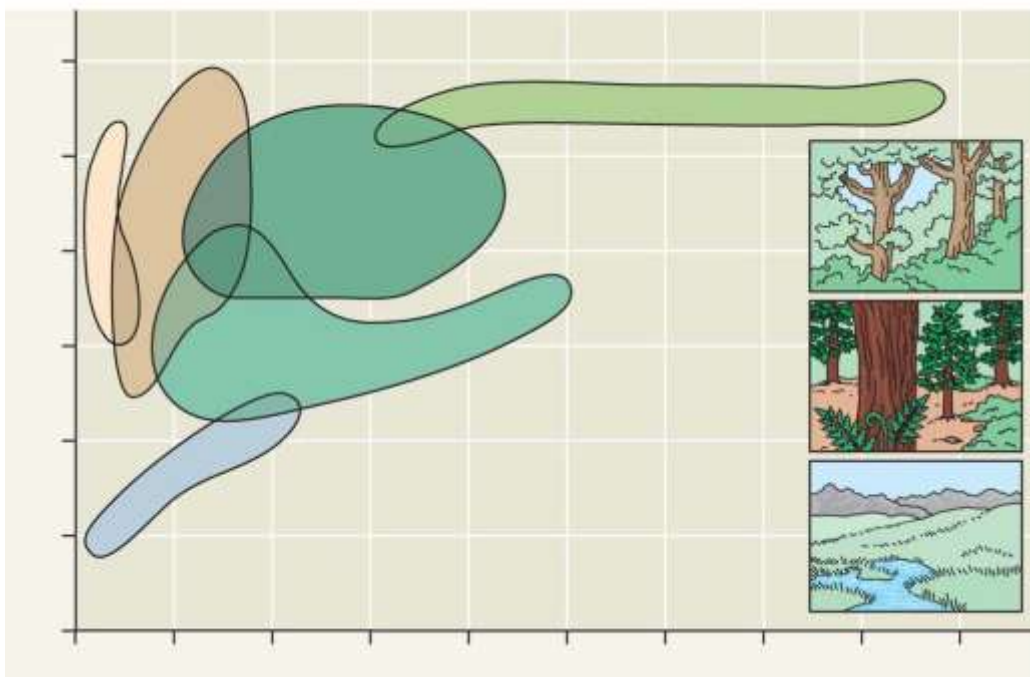
f) neritic / abyssal - _____

g) intertidal / pelagic - _____

13. Give a description of each of the following aquatic biomes. Include a brief description of the autotrophs and heterotrophs that live there.

Lakes	
Wetlands	
Streams and Rivers	
Estuaries	
Marine	

14. Label the axes of this figure, and identify each biome shown here. Try to do this based on your understanding of the figure, and then use the text to check your answers. Use these biomes: *temperate grassland*, *temperate broadleaf forest*, *tropical forest*, *taiga*, *desert*, *tundra*.



15. Describe ADAPTATIONS for representative flora and fauna in each of the following terrestrial biomes.

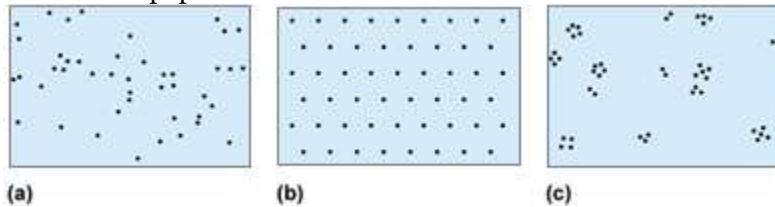
Tropical forest	
Desert	
Savannah	
Chaparral	
Temperate Grassland	
Temperate Broadleaf/Deciduous Forest	
Northern Coniferous Forest / Taiga	
Tundra	

CHAPTER 53: Population Ecology

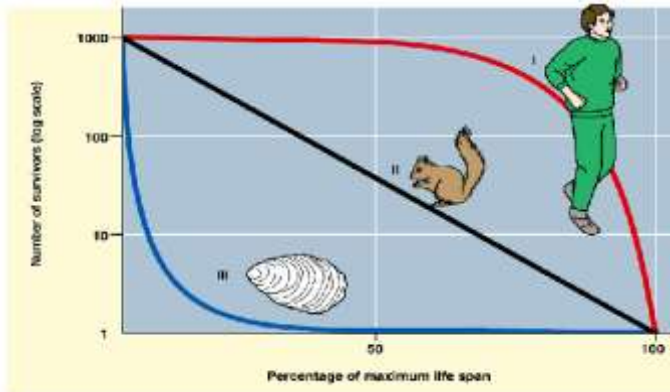
1. What is the difference between density and dispersion?

2. Explain the impact of *immigration* and *emigration* on population density. (To avoid confusion between these two terms, it might help to use this memory trick: **i**mmigration is the movement **i**nto a population, while **e**migration is the **e**xiting of individuals from a population.)

3. Label the dispersion pattern shown by each population in the figure below. Second, and most important, what do the dispersion patterns tell us about the population and its interactions?



4. *Survivorship curves* show patterns of survival. In general terms, survivorship curves can be classified into three types. Using the figure below, LABEL and **EXPLAIN** the three idealized survivorship patterns.



5. In the natural world, many species show survivorship curves that are combinations of the standard curves. How would an open nesting songbird's survivorship curve appear if it was Type III for the first year and then Type II for the rest of its life span? Sketch this curve on the survivorship curve graph last question.

6. What does it mean for a population to be in *exponential population growth*?

If a population of spiders is growing exponentially, what is the current rate of growth when the population size is 500, the carrying capacity is 7,000 and the maximum rate is 0.5? (Use the AP Biology Formula Sheet). – SHOW YOUR WORK

7. The logistic model describes how a population grows more slowly as it nears its carrying capacity. If the same population of spiders given above grows to 6,000, what will be the rate of growth? (Use the logistic growth equation from the AP Biology Formula Sheet). – SHOW YOUR WORK

8. What is carrying capacity? Why do some populations fluctuate around some value of K?

9. What are six examples of limiting resources that can influence carrying capacity?

10. What is the difference between K-selection and r-selection? Give an example of a species for each selection type.

11. Compare and contrast density-dependent regulation with density-independent regulation.

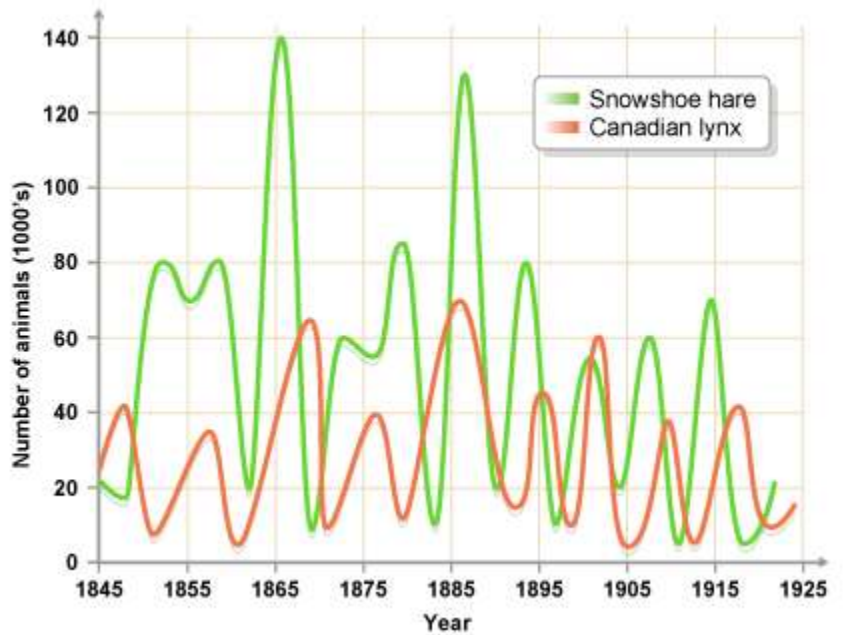
12. You should be able to look at *age-structure graphs* and make predictions about the future growth of the population. Use the age-structure graph(53.25) in your eText to describe the key features for the three age-structure graphs and predict how the population of each the following countries will grow.

Country	Key Features	Predicted Future Growth
Japan		
United States		
Bangladesh		

13. Why do *infant mortality* and *life expectancy* vary so greatly between certain countries?

14. Can the world's population sustain an *ecological footprint* that is currently the average American footprint? Explain.

15. Use the graph above to answer the following questions.
 a) What is the average rate of population growth in the lynx population from 1861 to 1867? – SHOW YOUR WORK



b) Explain the relationship between the populations of the predator (lynx) and prey (hare)?

CHAPTER 54: Community Ecology

1. What is a *community*? List six organisms that would be found in your Hooch's community.

2. Distinguish between *intraspecific competition* and *interspecific competition*. Give an example of each.

3. What is G. F. Gause's *competitive exclusion principle*? Give one example.

4. Define *ecological niche*.

5. Several species of *Anolis* lizards live in the same types of trees and have a similar diet. Discuss *resource partitioning* to explain how interspecific competition is reduced. (Use the Figure 54.2 in the eText.)

6. What is the difference between the *fundamental niche* and the *realized niche*?

7. A nonpoisonous brightly colored frog species has a range of colors and some of the individuals have colorations similar to a poison dart frog. Identify this type of mimicry. What affect would natural selection have on the nonpoisonous frog's population?

8. Describe and give an example of each of the following interactions:

Type of Interaction	Description	Example
Symbiosis		
Mutualism		
Commensalism		
Parasitism		

9. What is *species diversity*? What are its two components? Why is it important?

10. What does an ecologist summarize in a *food web*?

11. Know the levels of trophic structure in food chains. Give a food chain here, including four links that might be found in a prairie community, and label the trophic level for each organism.

12. According to the *energetic hypothesis*, why are food chains limited in length? How much energy is typically transferred to each higher level?

13. How is a *keystone species* different from a dominant species?

14. Name one keystone species, and explain the effect its removal has on the ecosystem.

15. *Ecological succession* is the changes in species that occupy an area after a disturbance. What is the difference between *primary succession* and *secondary succession*?
