

**AP Biology Summer Assignment Ms. Sanelli and Mrs. Jasko**  
**Summer 2009**

Biology is an exciting science to study - relevant and ever changing. During the course of the year, we will discuss, experiment, question and analyze.

The summer reading assignments have 2 purposes. First, the AP Biology curriculum is extensive and intensive. Your summer work will allow us to proceed at a more reasonable pace through the year. Secondly, ecological concepts form a basis for many of the curriculum topics. Having a firm foundation in ecology will be beneficial to you as we proceed through the rest of the curriculum.

**Assignment #1:** Read and study chapters 50, 52 - 55 (NOT 51).

A. Find a current event article for one of the above chapters. Hand in a copy of the article along with the following analysis:

1. 2 paragraph summary of the article.
2. 2 paragraph explanation of how the article relates to the chosen chapter and what ecological principles are discussed or demonstrated by the article.

B. Notice the list of chapter key concepts at the end of each chapter. Think about these concepts and notice the world around you. For each chapter, take an original photograph (NOT from the internet), which illustrates one of the chapter key concepts. Print your pictures (there should be 5) and for each photo, note the date, time, and location of the photo. Copy the key concept from Campbell and write a paragraph explaining why you chose this photo to illustrate this concept. Please place the photo on the same page as your explanation.

**Assignment #2:** One of the 4 attached AP Biology essays will appear on your first test. That test will be given within the first 2 weeks of the school year. You should be prepared to answer any of the questions fully. You are not required to hand anything in about these essays at this point.

Good luck, have a great summer and we look forward to exploring biology with you next year!

## AP Biology Essays - Ecology

- 1) A scientist working with *Bursatella leacfuli*, a sea slug that lives in an intertidal habitat in the coastal waters of Puerto Rico, gathered the following information about the distribution of the sea slugs within a ten-meter square plot over a 10-day period.

DISTRIBUTION OF SLUGS WITHIN A TEN-METER SQUARE PLOT

Time of day	Average distance between <u>Individuals (cm)</u>
Midnight	8.0
4 AM	8.9
8 AM	44.8
NOON	174.0
4 PM	350.5
8 PM	60.5
Midnight	8.0

For the data above, provide information on each of the following.

- Summarize the pattern.
- Identify THREE physiological or environmental variables that could cause the slugs to vary *their* distance from each other.
- Explain how *the* variable could bring about the observed pattern of distribution.

Choose ONE of the variables that you identified and design a controlled experiment to test your hypothetical explanation. Describe results that would support or refute your hypothesis.]

- 2) Living organisms play an important role in the recycling of many elements within an ecosystem. Discuss how various types of organisms and their biochemical reactions contribute to the recycling of either carbon or nitrogen in an ecosystem. Include in your answer one way in which human activity has an impact on the nutrient cycle you have chosen.

- 3) Interdependence in nature is illustrated by the transfer of energy through trophic levels. The diagram below depicts the transfer of energy in a food web of an Arctic lake located in Alaska.
- a) Choosing organisms from four different trophic levels of this food web as examples, explain how energy is obtained at each trophic level.
  - b) Describe the efficiency of energy transfer between trophic levels and discuss how the amount of energy available at each trophic level affects the structure of the ecosystem.
  - c) If the cells in the dead terrestrial plant material that washed into the lake contained a commercially produced toxin, what would be the likely effects of this toxin on this food web?

QuickTime™ and a  
TIFF (LZW) decompressor  
are needed to see this picture.

Explain.

4. Many populations exhibit the following growth curve:

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TIFF (LZW) decompressor  
are needed to see this picture.

- A) Describe what is occurring in the population during phase A.
- B) Discuss THREE factors that might cause the fluctuations shown in phase B.
- C) Organisms demonstrate exponential (“r”) or logistic (“K”) reproductive strategies. Explain these two strategies and discuss how they affect population size over time.