

## Welcome to AP Biology!

You have chosen to begin an adventure that is both fascinating and rewarding. You are studying biology at a time of many scientific advances. Perhaps more knowledge is being realized today in biology than in any other area of science. AP Biology is an intensive and comprehensive survey course that follows a strict outline and schedule. It was designed by a group of college professors and high school science teachers to be equivalent to an introductory college biology course. You can download a complete description of the course that the College Board endorses at this website:

[http://www.collegeboard.com/student/testing/ap/sub\\_bio.html?biology](http://www.collegeboard.com/student/testing/ap/sub_bio.html?biology)

This course will be taught using lectures, discussions, and laboratory investigations. This course will be rigorous, demanding and require a significant portion of your time beginning this summer.

AP Biology entails a lot of reading, terminology, memorization, concepts, and (most of all) personal motivation for scientific knowledge and inquiry. You must be able to follow a rigorous schedule, work independently, and in groups, have a good grasp of general biology, have good writing skills, be able to think critically, and genuinely enjoy science.

We use a college text, college labs, and a comprehensive college curriculum. Therefore, the pace of this class will be rapid; at times it will boggle your mind how quickly we will move. It is vitally important that consistently keep up to date with the text reading, class work, lab assignments, etc. Much study and review will have to be done on your own - *outside of class!*

Class attendance is extremely important in AP Biology. Material is covered quickly and in much greater depth and detail than your general biology course. We will discuss in class what is important. Obviously, the tests will reflect those discussions. Tests will be constructed in the format of the AP exam meaning, they will include both Multiple Choice and Free-Response Questions. Expect to take 35-40 tests during the school year!

Excessive absences FOR WHATEVER REASON - illness, athletic competitions, doctor's appointments, etc. - will jeopardize your chances of success in the course. Material missed as a result of absences will be very difficult (IF NOT IMPOSSIBLE) to make up. As you will be aware of scheduled lab days, every effort should be made to be present on those days.

In September you will receive a detailed calendar that will include all assignments, tests, and labs. You **MUST NOT** fall behind. It is strongly recommended that you purchase an AP BIOLOGY EXAM REVIEW BOOK right NOW! That way you can begin preparing for the exam as soon as possible.

Everyone enrolled in AP classes at Lenape Valley Regional is EXPECTED to sit for the AP exam in May.

The date for the BIOLOGY exam is: **Monday, May 9<sup>th</sup>, 2011 at 8:00 AM**

Enjoy Your Summer - Mr. Lusto ([tlusto@lvhs.org](mailto:tlusto@lvhs.org))

Lenape Valley Regional High School  
Science Department - Tom Lusto ([tlusto@lvhs.org](mailto:tlusto@lvhs.org))

## Advanced Placement Biology Summer Assignment

DUE DATE: 1<sup>ST</sup> FULL DAY OF SCHOOL

- You will cover Chapter's 50-54 (Ecology) in the Textbook: *Biology* (Campbell and Reece, 7<sup>th</sup> Edition) during the summer. When you come back to school, you will have a Test on these five chapters during the second week after you return (Day 4, Week 2).
- The Test will be 100 Multiple Choice and 2 Free Response questions in the Style of the Advanced Placement Examination.
- You will have your **Lab Period** to complete the test.
- Maintain a READING NOTEBOOK on the chapters that you read. *This should be NEAT and well organized. This notebook will be checked on the FIRST full day of school when your written assignment is turned in.*
- Any questions? Email me at: [tlusto@lvhs.org](mailto:tlusto@lvhs.org)

Answer the following Questions per Chapter..... And then define the key terms. All must be WORD PROCESSED and use COMPLETE SENTENCES. Answer all parts of each question to the BEST of your ability.

### Recommended Sequence of Doing This Assignment

1. READ the entirety of Chapter 50 (don't forget the KEY CONCEPTS at the very beginning)
  - DO NOT forget to "Read" all of the diagrams, charts and tables
2. READ the Summary of Key Concepts in the Chapter Review
3. REREAD the chapter and this time TAKE NOTES in your notebook as you proceed.
4. READ the Summary of Key Concepts again to see if you "get" them.
5. Answer each of the Unit questions for that apply to this chapter. (Don't forget to WORD PROCESS)
  - REMEMBER to pay attention to specifically what the question is asking and answer that and all of that ONLY!
6. REPEAT for Chapter 51... and so on.
7. CAUTION: the www is a wonderful place to find reviews, tutorials, animations, etc. but not in PLACE of reading and taking notes...rather in addition to!
  - Try, for exempling "googling" **ecology tutorial** under advanced search and see what "pops up"!

## Unit 15: Ecology (Chapter 50-54)

1. Define the terms *ecology*, *ecosystem*, *biome*, *biosphere*, *community*, *biomass*.
2. Distinguish among *organismal ecology*, *population ecology*, *community ecology*, *ecosystem ecology*, and *landscape ecology*.
3. Describe the problem of introduced species and the specific problems posed by the introduction of African bees and zebra mussels.
4. Identify the major trophic levels and give three examples of organisms for each.
5. Distinguish among the various zones found in aquatic biomes
6. Define *behavior*.
7. Define *fixed action patterns* and give examples in fish and humans.
8. Explain the *optimal foraging theory* and illustrate it with examples.
9. Define *imprinting* and explain the importance of the sensitive period. Illustrate these concepts using examples from bird song.
10. Distinguish between *classical conditioning* and *operant conditioning*.
11. Define *play* and describe several possible adaptive advantages of this behavior.
12. Describe the advantages of courtship.
13. Define and distinguish between *monogamous* and *polygamous* mating relationships and between *polygyny* and *polyandry*.
14. Define *Hamilton's rule* and the concept of kin selection.
15. Describe the characteristics of populations that exhibit Type I, Type II, and Type III survivorship curves.
16. Compare the geometric model of population growth with the logistic model.
17. Distinguish between *r*-selected populations and *K*-selected populations.
18. Explain how density-dependent factors affect population growth.
19. Explain how interspecific competition may affect community structure.
20. List four possible specific interactions and explain how the relationships affect the population densities of the two species.
21. Define and compare *predation*, *herbivory*, and *parasitism*.
22. Describe the defense mechanisms that evolved in plants to reduce predation by herbivores.
23. Explain how *cryptic coloration* and *warning coloration* aid an animal in avoiding predators.
24. Distinguish between *Batesian mimicry* and *Müllerian mimicry*.
25. Describe how predators use mimicry to obtain prey.
26. Distinguish among *parasitism*, *mutualism*, and *commensalism*.
27. Describe and distinguish between *species richness* and *relative abundance*.
28. Describe the relationship between autotrophs and heterotrophs in an ecosystem.
29. Explain how decomposition connects all trophic levels in an ecosystem.
30. Define and compare *gross primary production* and *net primary production*.
31. Compare primary productivity in marine, freshwater, and terrestrial ecosystems.
32. Distinguish between energy pyramids and biomass pyramids. Explain why both relationships are in the form of pyramids. Explain the special circumstances of inverted biomass pyramids.
33. Explain why food pyramids usually have only four or five trophic levels.
34. Explain why toxic compounds usually have the greatest effect on top-level carnivores.
35. Distinguish between biotic and abiotic factors in an ecosystem. Give several examples.
36. Diagram and explain the nitrogen cycle.
37. Diagram and explain the water cycle.
38. Diagram and explain the carbon cycle.

## AP Bio - Course Details

The College Board Identifies 8 Major Themes to be studied.

1. **Science as a Process** - Science is a way of knowing. It can involve a discovery process using inductive reasoning, or it can be a process of hypothesis testing.
2. **Evolution** - Evolution is the biological change of organisms that occurs over time and is driven by the process of natural selection. Evolution accounts for the diversity of life on Earth.
3. **Energy Transfer** - Energy is the capacity to do work. Organisms are active (living) because of their abilities to link energy reactions to the biochemical reactions that take place within their cells.
4. **Continuity and Change** - All species tend to maintain themselves from generation to generation using the same genetic code. However, there are genetic mechanisms that lead to change over time, or evolution.
5. **Relationship of Structure to Function** - The structural levels from molecules to organisms ensure successful functioning in all living organisms and living systems.
6. **Regulation** - Everything from cells to organisms to ecosystems is in a state of dynamic balance that must be controlled by positive or negative feedback mechanisms.
7. **Interdependence in Nature** - Living organisms rarely exist alone in nature.
8. **Science, Technology, and Society** - Scientific research often leads to technological advances that can have a positive and/or negative impacts on society as a whole.

The Approximate Percentages of topics on the AP exam.

### Molecules and Cells (25%)

- Chemistry of Life (7%)
  - ✓ Water
  - ✓ Organic molecules in organisms
  - ✓ Free energy changes
  - ✓ Enzymes
- Cells (10%)
  - ✓ Prokaryotic and eukaryotic cells
  - ✓ Membranes
  - ✓ Subcellular organization
  - ✓ Cell cycle and its regulation
- Cellular Energetics (8%)
  - ✓ Coupled reactions
  - ✓ Fermentation and cellular respiration
  - ✓ Photosynthesis

### Heredity and Evolution (25%)

- Heredity (8%)
  - ✓ Meiosis and gametogenesis

- ✓ Eukaryotic chromosomes
- ✓ Inheritance patterns
- **Molecular Genetics (9%)**
  - ✓ RNA and DNA structure and function
  - ✓ Gene regulation
  - ✓ Mutation
  - ✓ Viral structure and replication
  - ✓ Nucleic acid technology and applications
- **Evolutionary Biology (8%)**
  - ✓ Early evolution of life
  - ✓ Evidence for evolution
  - ✓ Mechanisms of evolution
- Organisms and Populations (50%)**
- **Diversity of Organisms (8%)**
  - ✓ Evolutionary patterns
  - ✓ Survey of the diversity of life
  - ✓ Phylogenetic classification
  - ✓ Evolutionary relationships
- **Structure and Function of Plants and Animals (32%)**
  - ✓ Reproduction, growth, and development
  - ✓ Structural, physiological, and behavioral adaptations
  - ✓ Response to the environment
- **Ecology (10%)**
  - ✓ Population dynamics
  - ✓ Communities and ecosystems
  - ✓ Global issues