

Center for Talent Development
Gifted LearningLinks
AP Biology

Text: *Biology*, 7th edition by Campbell and Reece
<http://www.campbellbiology.com/>
Study Guide for *Biology*, 7th edition
AP Biology Lab Manual for Students, College Board
Biology Labs Online <http://biologylab.awlonline.com/>

Course Description

AP Biology is a project- and laboratory-based course that allows students to generate knowledge about biology. The AP Biology course is equivalent to a first-year college biology course, and its content helps prepare the student for the Advanced Placement Biology examination. The course is based on the premise that science is a process, not an accumulation of facts, and that evolution is the foundation of modern biological models and thought. The course examines life on all organizational levels: from the molecular to the cellular level, from organ systems to whole organisms, relationships among organisms and the environment. Evolution is the unifying theme of the course. The major themes of biology, integrated throughout the course, include science as process, evolution, energy transfer, continuity, and change, structure and function, regulation, interdependence, and the relation of science, technology, and society.

Course Goals and Objectives

The main goals of the AP Biology course are to enable students to develop a conceptual framework for biology, an appreciation of science as an inquiry process, and an integration of the major themes of biology, including science as process, evolution, energy, transfer, continuity and change, structure and function, regulation, interdependence, and the relation of science, technology, and society.

At the completion of AP Biology, the student will be able to organize, discuss, explain, analyze, interpret, and integrate topics related to

1. the unifying themes of biology
2. scientific experiments and experimental results
3. the relationship of structure and function at molecular, cellular, organism, population, and ecosystem levels
4. fundamental characteristics of living organisms
5. chemical processes underlying life processes
6. the structure and function of cells and cell parts
7. the central role of energy and energy transfer in living systems
8. factors associated with continuity, change, genetic variation in individuals and in populations
9. the role of natural selection in evolution and how biodiversity relates to evolutionary relationships
10. the five-Kingdom and three-Domain classification systems
11. differences and similarities in major groups of microorganisms, fungi, plants, and animals
12. the relation of form, function, structure, and regulation of internal environments in representative plants and animals
13. the interactions among organisms and their environment
14. the historical development of major ideas in biology
15. the relation of science, technology, and society

In addition, the laboratory program will enable students

1. to understand problems expressed as experimental questions
2. to design and carry out experiments that answer questions about biological relationships
3. to propose questions based on experimental results
4. to manipulate data acquired during experiments and make conclusions about experimental results
5. to use statistical tests, such as χ^2 , to support or refute hypotheses
6. to decide how to display data
7. to construct data charts and graphs
8. to determine sources of experimental error
9. to suggest improvements for experimental procedures
10. to collaborate with other students to plan and carry out experiments

- 11. to communicate accurately and meaningfully about observations and conclusions
- 12. to write formal lab reports

Instructor Biography:

Mrs. Nuño currently teaches AP Biology, Chemistry, and Honors Chemistry in an independent school in western Massachusetts. She has a B.S. in environmental health from UCLA, an M. A. in biological science from UC Santa Barbara, a certificate in online education from UCLA, and extensive course work in science education. Prior to moving to the east coast, she taught AP Biology, chemistry, and conceptual physics in a private school in Los Angeles. She now lives on a tree farm in southern Vermont!

Contact Information:

Email: XXXXXXXXXXXXXXXXXXXX
 Cyber Office Hours (East Coast Time)
 Daily: 5:00—6:00 am
 Tuesday: 6:00—7:00 pm
 Wednesday: 7:00—8:00 pm
 Thursday: 8:00—9:00 pm

Course Overview

Week	Unit	Activities, Labs, and Tests	Chapter Readings
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GLL Sample

End of First Quarter
Midterm progress reports sent if you are struggling (C or below) or if you have missing work.

Week	Unit	Activities, Labs, and Tests	Chapter Readings
10—12	<p>4. <i>Energetics</i></p> <ul style="list-style-type: none"> metabolism free energy energy transfer enzymes ATP electron transport glycolysis fermentation respiration photosynthesis 	<ul style="list-style-type: none"> Enzymes Lab Catalase Lab Plant Pigments Lab Leaf Function Lab Habitat and Light Intensity Lab Respiration Lab Mitochondria Lab Unit 4 Problem Set Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org <p><i>Unit 4 Test</i></p>	8—10
13—15	<p>5. <i>Heredity</i></p> <ul style="list-style-type: none"> Mendel And Morgan laws of inheritance probability sex-linkage pedigrees genes and chromosomes recombination evidence of evolution 	<ul style="list-style-type: none"> Chi-Square Lab Corn Genetics Lab Fly Lab Genetics WebLabs Pedigree Lab Unit 5 Problem Set Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org <p><i>Unit 5 Test</i></p>	14—15
16—18	<p>6. <i>Molecular Genetics</i></p> <ul style="list-style-type: none"> The Central Dogma DNA structure and function protein synthesis genetics of viruses genetics of bacteria genetics of eukaryotes biotechnology 	<ul style="list-style-type: none"> DNA WebLabs Molecular Genetics—Translation Lab Hemoglobin Genetics Lab Unit 6 Problem Set Genetics of Development #7 from Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org <p><i>Unit 6 Test</i></p>	16—21
<p>End of First Semester Progress Reports sent to all students</p>			

Week	Unit	Activities, Labs, and Tests	Chapter Readings
19—21	<p><i>7. Evolutionary Mechanisms</i> Darwin And Wallace natural selection population evolution population genetics Hardy-Weinberg Equilibrium <i>Origin Of Species</i> macroevolution microevolution origin of life scenarios endosymbiosis fossil record phylogeny and systematics cladistics molecular clocks</p>	<p>Population Genetics Lab Natural Selection Lab Evolution WebLabs Unit 7 Problem Set Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org</p> <p><i>Unit 7 Test</i></p>	22—25
22—24	<p><i>8. Biological Diversity</i> phylogeny and systematics domains and kingdoms Prokaryotes: Archaea Prokaryotes: Eubacteria Protista Plantae Fungi Animalia</p>	<p>Field Trip: Zoo, Botanic Garden, Natural History Museum Field Trip Unit 8 Problem Set http://www.learner.org/resources/series187.html Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org</p> <p><i>Unit 8 Test</i></p>	26—34
25—27	<p><i>9. Plant Form and Function</i> structure growth development regulation response transport systems plant nutrition alternation of generations angiosperm reproduction evolution of angiosperms</p>	<p>Transpiration Lab Flower Morphology Lab Leaf Morphology Lab Unit 9 Problem Set Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org</p> <p><i>Unit 9 Test</i></p>	35—39
<p style="text-align: center;">End of Third Quarter Midterm progress reports sent if you are struggling (C or below) or if you have missing work.</p>			

Week	Unit	Activities, Labs, and Tests	Chapter Readings
28—31	<p>10. <i>Animal Form and Function</i></p> <ul style="list-style-type: none"> development life cycles regulation and homeostasis nutrition circulation and gas exchange immune system osmoregulation and excretion endocrine system reproduction nervous systems and sense organs musculoskeletal system adaptations evolutionary relationships 	<p>Reaction Time Lab Cardio Lab Animal Behavior Lab Unit 9 Problem Set Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org</p> <p><i>Unit 10 Test</i></p>	40—49
32—34	<p>11. <i>Ecology, Populations, and Behavior</i></p> <ul style="list-style-type: none"> abiotic and biotic factors environments ecosystems population ecology community ecology keystone species biogeography and evolution animal behavior 	<p>Lesson of the Kaibab Lab Species Diversity Labs Primary Productivity Lab Community Analysis Lab Homework Problem Sets Unit 10 Problem Set Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org</p> <p><i>Unit 11 Test</i></p>	50—55
35—36	<p>12. <i>Review</i></p> <ul style="list-style-type: none"> Biological Themes Ecology and Behavior Structure and Function Energetics Evolution Science-Technology-Society Symbiosis Lab Skills 	<p>Cumulative Review from http://www.campbellbiology.com Tutorial Review from http://www.hippocampus.org Lab Bench Review http://phschool.com/science/biology_place/labbench/</p> <p><i>Final Exam</i></p>	
<p>End of Second Semester and End of Course Final Evaluation sent to all students.</p>			

Grading Information

Activity	Description of Activity
Tests	<p>The AP Exam consists of both multiple choice questions and free response questions. Free response questions generally have several parts and require that you integrate information from various areas of biology.</p> <p>The Unit Tests consist of multiple choice and free response questions from the chapters indicated in the Course Overview. <i>There will be 11 unit tests.</i></p> <p>Responses to the multiple-choice and free response questions on the Unit Tests will be submitted <i>online</i> in the Blackboard classroom.</p>
Problem Sets	There are 11 problem sets that are in multiple-choice format, similar to those on the Unit Tests.
Labs	Instructions for Hands-on and Virtual Lab activities will be available in the Blackboard classroom. Students should expect to spend 2—3 hours per week on lab activities! <i>Formal lab reports are required for all labs.</i>
Discussion	Discussing concepts and ideas is a very important part of learning any subject but it is particularly important in an online environment. Students should post questions and responses in the discussion board about the labs and chapter topics.
Tutorials	Interactive activities and online tutorials are used to supplement the reading assignments.
Final Exam	This exam will consist of 100 multiple choice questions and 5 free response questions. This format and questions will be similar to those found on the AP Biology exam.

Grading Scale				
A+ (99-100)	B+ (87-89)	C+ (77-79)	D+ (67-69)	F (Below 60)
A (93-98)	B (83-86)	C (73-76)	D (63-66)	
A- (90-92)	B- (80-82)	C- (70-72)	D- (60-62)	