

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 Physics in an independent school in western Massachusetts. She has as 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!

Course Overview

Unit	Topics	Activities, Labs, and Tests	Chapter Readings
1	<i>Themes in Biology</i> science as process science as product emergent properties biological organization domains and kingdoms evolutionary relationships unity and diversity	<i>Diagnostic Test</i> Scientific Method—Cricket Lab Measurement Lab Seed Germination Lab Unit 1 Problem Set Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org <i>Unit 1 Test</i>	1
2	<i>Chemistry of Life</i> atoms and elements molecules and compounds chemical bonding molecular shape and function periodic table properties of water chemistry of carbon functional groups macromolecules enzymes molecular evolution	Isomer Construction Lab Hemoglobin Structure Lab Unit 2 Problem Set Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org <i>Unit 2 Test</i>	2—5
3	<i>Cell and Cell Processes</i> prokaryotic cells eukaryotic cells cell organelles evolution and endosymbiosis membrane structure and function transport mechanisms cell cycles mitosis and meiosis cell communication	Diffusion and Osmosis Lab Active Transport Lab Mitosis Lab Meiosis Lab Unit 3 Problem Set Interactive Activities from http://www.campbellbiology.com Tutorials from http://www.hippocampus.org <i>Unit 3 Test</i>	6—7 11—13
End of First Quarter Midterm progress reports sent if you are struggling (C or below) or if you have missing work.			