



La Costa Canyon High School

Science *AP Biology*

Level of Difficulty	Estimated Homework Time	Prerequisites
<input type="checkbox"/> Moderate <input type="checkbox"/> Difficult <input checked="" type="checkbox"/> Very Difficult	120 minutes per day* *This is a general guideline for planning and scheduling purposes. A student's ability level may affect actual preparation time needed.	<u>District</u> The ability and academic background to complete college-level work. <u>Department</u> B or better in Biology B or better in Chemistry or C or better in AP Chemistry Please see student background expectations

Course Description

A highly specialized course for the qualified student whose future includes university attendance with a possible major in the sciences. The course has a focus on cellular ultrastructure, genetics, biochemical processes, biotechnology, comparative anatomy and physiology, mechanisms of evolution, embryonic development and the role of humans with nature.

Students will explore these topics through discussions, laboratory investigations, teacher demonstrations, and in-class assignments. This course is aligned with the California State Standards in Biology as well as the guidelines described by College Board.

Student Background Knowledge

A student entering AP Biology should be able to:

- 7th grade Science Investigation and Experimentation Standards:
- Select and use appropriate tools and technology (including calculators, computers, balances) to perform tests, collect data, and display data.
- Use a variety of print and electronic resources (including the internet) to collect information and evidence as a part of a research project.
- Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.

- Communicate the steps and results from an investigation in written report and oral presentations.

8th grade Science Investigation and Experimentation Standards:

- Plan and construct a scientific investigation to test a hypothesis.
- Construct appropriate graphs from data and develop quantitative statements about the relationships variables.
- Apply simple mathematical relationships to determine a missing quantity in a mathematic expression, given the two remaining terms (including $\text{speed}=\text{distance}/\text{time}$, $\text{density}=\text{mass}/\text{volume}$, $\text{volume}=\text{area} \times \text{height}$)

9th-12th Science Investigation and Experimentation Standards:

- Formulate explanations by using logic and evidence.
- Distinguish between hypothesis and theory as scientific terms.
- Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.
- Analyze situations and solve problems that require combining and applying concepts from more than one area of science.
- Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions.

9th-12th Biology Standards:

- Explain that the fundamental life processes of plants and animals depend on a variety of chemical reactions that occur in specialized areas of the organism's cells.
- Explain how mutation and sexual reproduction lead to genetic variation in a population.
- Explain how a multicellular organism develops from a single zygote, and its phenotype depends on its genotype, which is established at fertilization.
- Explain how genes are a set of instructions encoded in the DNA sequence of each organism that specify the sequence of amino acids in proteins characteristic of that organism.
- Explain how genetic composition of cells can be altered by incorporation of exogenous DNA into the cells.
- Explain how stability in an ecosystem is a balance between competing effects.
- Explain how the frequency of an allele in a gene pool of a population depends on many factors and may be stable or unstable over time.
- Explain how evolution is the result of genetic changes that occur in constantly changing environments.
- Explain how a result of the coordinated structures and functions of organ systems, the internal environment of the human body remains relatively stable (homeostatic) despite changes in the outside environment.

9th-12th Chemistry Standards:

- List observable properties of acids, bases, and salt solutions
- Use the pH scale to characterize acid and base solutions.
- Calculate pH from the hydrogen-ion concentration.
- Define solute and solvent.

- Explain that reaction rates depend on such factors as concentration, temperature, and pressure.

Algebra 1 Standards:

- Interpret and use ratios in different contexts to show relative sizes of two quantities, using appropriate notations.
- Graph linear functions, noting that vertical change (change in y-value) per unit of horizontal change (change in x-value) is always the same and know that the ratio is called the slope of a graph.
- Students apply algebraic techniques to solve rate problems and percent problems.

Grading

The grading system is based on weighted percentages. Each assignment will have a point value and be weighed according to the category it falls under. Individual teachers may make slight modifications on the weighted percentages.

Additional Information for Students/Parents

- 10 credits
- Meets UC/CSU subject area "d" requirement
- Meets high school graduation requirement for life science
- Weighted grade