

## La Costa Canyon Course Profile

## Chemistry

➤ **10 credits (Physical Science)**

➤ **Meets UC/CSU “d” Laboratory Science**

### Course at a Glance

Level of Difficulty	Time Required Outside of the Classroom	Recommended Prerequisites
<input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Difficult <input type="checkbox"/> Very Difficult	4-6 hours per week*  * This is a general guideline for planning and scheduling purposes. A student’s ability level may affect the actual preparation time needed to be successful.	Successful completion of <b>Algebra I</b> and <b>Geometry</b> with a <b>B or better</b>  Concurrent enrollment in <b>Algebra II</b>  Successful completion of <b>Biology</b> with a <b>C or better</b>

### Course Description

Chemistry involves the study of matter and energy. Many common and current problems of the modern world are related to the course content. The central theme of the course is problem solving within chemistry. The California State Standards for Chemistry will be covered in this class, which include the following topics:

- Matter and Measurement
- Atoms, Molecules, and Ions
- Stoichiometry
- Aqueous Solutions
- Thermochemistry
- Periodic Properties
- Solids, Liquids, and Gases
- Chemical Bonding
- Molecular Geometry
- Properties of Solutions
- Chemical Kinetics
- Chemical Equilibrium
- Acid-Base Chemistry
- Thermodynamics
- Electrochemistry
- Nuclear Chemistry

Students will explore these topics through classroom and online discussions, laboratory investigations, teacher demonstrations, and in-class assignments. This course is aligned with the California State Standards for Chemistry.

### Student Background Skills

Chemistry is a course which involves abstract concepts and requires a good foundation in Algebra and the Scientific Method. To make sure you are prepared for Chemistry at La Costa Canyon High School there are three recommended areas in which you should be competent:

- Mathematics (Algebra, Reasoning with Proportions, etc.)
- Study Skills (Organization, Note-taking, etc.)
- Technology (Use of Computers/Calculators)

## ***Mathematics***

In order to increase success in College Preparatory Chemistry it is **strongly recommended** each student be proficient with the following mathematical topics:

- Solving for a Variable in a multi-variable problem using Algebra.
- Use of exponents (simplification, division, and multiplication).
- Use ratios and proportions.
- Perform calculations involving units (unit analysis or dimensional analysis).
- Simplify rational expressions.
- Add, subtract, multiply, and divide numbers in scientific notation.
- Add, subtract, multiply, and divide rational numbers **without** a calculator.

## ***Study Skills***

Along with these mathematical skills, students are assumed to be able to perform the following study skills:

- The ability to read and comprehend information from a textbook.
- The ability to organize and use a notebook for referencing notes and laboratory reports.
- The ability to record notes from a science textbook or information presented in a discussion/lecture.
- The ability to use other resources to assist in gathering content information, such as the Internet, other textbooks, tutoring, etc.
- The ability to seek help when unable to understand content or materials presented or read in class, without prompting from the instructor.

## ***Technology***

To further enhance the experience in Chemistry, technology is used. Students should be able to perform the following tasks:

- The ability to use a word processing program (Microsoft Word, Microsoft Works, WordPerfect, etc.) to type an assignment.
- The ability to embed graphs and tables into a word processing program.
- The ability to use the Internet to read, compose, and send e-mails
- The ability to attach a document to an e-mail.
- The ability to scan a document using a document scanner.
- The ability to use an Internet Browser (Internet Explorer, Mozilla, Opera, etc.) to navigate the World Wide Web.

## Sample Mathematical Problems

Students planning on entering Chemistry should be able to solve the following types of mathematical problems.

Calculate the following:

Solve for x for questions 1-4.

1.  $\frac{3x}{y} = \frac{6g}{b}$  \_\_\_\_\_

2.  $\frac{2x^2}{3} = dg$  \_\_\_\_\_

3.  $d = \frac{t}{x}$  \_\_\_\_\_

4.  $\frac{2\sqrt{x}}{c} = y$  \_\_\_\_\_

5.  $\frac{6.6 \times 10^{-8}}{3.3 \times 10^{-4}} =$  \_\_\_\_\_

6.  $(1.56 \times 10^{-7}) + (2.43 \times 10^{-8})$  \_\_\_\_\_

7.  $\frac{7.4 \times 10^{10}}{3.7 \times 10^3} =$  \_\_\_\_\_

8.  $(2.5 \times 10^{-6}) - (3.0 \times 10^{-7})$  \_\_\_\_\_

9.  $(2.67 \times 10^8) \times (9.5 \times 10^4)$  \_\_\_\_\_

10.  $(2.3 \times 10^4) \times (2.0 \times 10^{-3})$  \_\_\_\_\_

10. A salesman rented a car that got 35 miles per gallon. He paid \$19.50 a day for the car plus \$0.26 per mile. He rented the car for 1 day and paid \$39. How many miles did he travel?

11. One inch equals 2.54 centimeters. A meter is 100 centimeters. How many inches are there in a meter?

## Answers to Sample Mathematics Problems for Chemistry

1.  $x = \frac{2gy}{b}$
2.  $x = \sqrt{\frac{3dg}{2}}$
3.  $x = \frac{t}{d}$
4.  $x = \frac{(cy)^2}{4}$
5.  $2.0 \times 10^{-4}$
6.  $1.803 \times 10^{-7}$
7.  $2 \times 10^7$
8.  $2.2 \times 10^{-6}$
9.  $2.53 \times 10^{13}$
10. 46
11. 75 miles
12. 39.37 inches