

HIGH SCHOOL CHEMISTRY WITH LAB

PRICING:

<i>Live Instructional Hours</i>		<i>Pricing</i>	
Per Week	Per Semester	Per Month	Per Semester*
2.5 hours	40 hours	\$140	\$700

OCEAN GROVE FAMILIES:

If you're using Ocean Grove Charter School instructional funds, please ask your Education Specialist (ES) to generate a purchase order for the full semester price of your selected course(s). The Santa Cruz Learning Center will then bill Ocean Grove on a monthly basis. Don't forget to also register directly with us to reserve your spot.

PREREQUISITE:

Algebra I or Integrated Math 1, or equivalent experience. Students must understand how to use algebra to solve general word problems and equations.

TEXTBOOK:

We use a free online book through CK-12 that has been customized for our course.
The book is [available here](#).

COURSE DESCRIPTION:

This is a one-year, standards-based course of study that covers fundamental chemical concepts and principles. This course is designed to provide an introduction to chemistry, preparing students to succeed in college-level chemistry courses and laying a solid groundwork for further exploration in other scientific fields, such as biology, physics, and geosciences. In this laboratory science course, students will engage in various learning approaches, including classroom work, independent bookwork, associated text assignments, laboratory sessions, alternative group work, and applications of mathematics and problem-solving. The students will demonstrate their critical thinking abilities by answering analytical questions from the textbook, key assignments, and lab activities. The students will gain a deeper understanding of fundamental chemical concepts, including atomic theory and its relationship to chemical behavior, chemical bonding, the mole and stoichiometry, molecular kinetics, energy relationships, solution dynamics, acids and bases, equilibrium, organic and biological chemistry, and nuclear interactions.

Students will develop critical thinking skills required to not only understand key concepts but also apply, analyze, and synthesize these concepts. This course is created to give options to students who learn in different ways while ensuring that all students can ask questions, define and solve

problems through investigations, analyze and interpret data, and use it to create models, argue using evidence, and think critically about Chemistry.

BOOKWORK GUIDELINES

- Please complete all bookwork in your own words and complete sentences.
- Copying and pasting from the book—or asking Google—is a no-go! The Google fairies don't always understand the context of our questions, and their answers can lead students astray.
- There is a Google Docs for each chapter's questions. You should make a copy of these documents, save them in your biology folder, and title them with the chapter number and your first name.
- **A-G and Honors Students:** You must complete all questions in each section.
- **Non-A-G Students:** Please complete two questions from each section.

MATERIALS

We ask that each student come prepared with the following items:

- **COMPOSITION NOTEBOOK** – This will be used for lab work and handwritten class notes. If your child frequently forgets their notebook, we're happy to store it at the learning center so it's always ready for class.
- **THREE-RING BINDER** – We'll conduct periodic binder checks throughout the year to help students build organization and study skills.

PLEASE ORGANIZE THE BINDER WITH DIVIDERS LABELED:

- Guided Notes
- Labs and Worksheets
- Returned Work (Work Samples)
- **WRITING UTENSIL** – A pen or pencil is needed each day for taking notes and completing assignments.

FOR STUDENTS PARTICIPATING VIRTUALLY: Please contact Ms. Malika directly to receive the list of lab materials you'll need for virtual participation.

NOTE: Students who frequently misplace materials (especially their notebook) are welcome to keep their supplies at the learning center for convenience.

GRADE WEIGHTING

We use the same grade weighting center-wide in all of our middle and high school courses.

50% Assignments and Projects

30% Lab assignments

20% Assessments and Quizzes (this includes binder checks for each unit)

FALL SEMESTER

UNIT 1: STRUCTURES AND PROPERTIES OF MATTER

Students will explore the fundamental structures and properties of matter. Beginning with an in-depth study of matter, encompassing its properties, elements, and application of the scientific method. Students will master units of measurement, scientific measurements, and calculations. The exploration extends to the atom, tracing its evolution from a philosophical concept to a scientific theory. It offers students a profound understanding of its structure and role as the fundamental building block of matter.

A central focus of this unit is the intricate arrangement of electrons in atoms, encompassing the development of a new atomic model and comprehension of the Quantum Model of the Atom. Students will explore electron configurations, the historical development of the Periodic Table, and the relationship between electron configurations and periodic properties. The exploration further extends to chemical bonding, covering covalent and molecular compounds, ionic bonding and ionic compounds, metallic bonding, and molecular geometry. With this knowledge, students will adeptly use the periodic table to solve chemical problems, infer and predict chemical bonding, and articulate chemical equations. Practical applications of electron configuration will empower students to predict and analyze chemical reactions in laboratory settings. Throughout this unit, essential skills such as drawing accurate molecular geometry representations, understanding chemical formulas, compounds, oxidation numbers, and the practical use of chemical equations will be honed.

UNIT 2: CHEMICAL BONDING & REACTIONS

Students will master the fundamentals of chemical formulas and compounds, encompassing the comprehension of chemical names, formulas, and oxidation numbers. The exploration extends to the practical applications of using, determining, and describing

chemical formulas, equations, and reactions. Students will explore various types of chemical reactions, the activity series of elements, and the fundamental principles of Stoichiometry. Students will navigate concepts such as limiting reactants and percentage yields through ideal stoichiometric calculations, fostering a quantitative understanding of chemical processes.

Students will define and predict chemical equations, coupled with the ability to hypothesize and analyze these equations in a laboratory setting. Students will adeptly predict reactions, construct models, categorize reactions, electron configuration, and bonding. The unit emphasizes chemical nomenclature and applying stoichiometry to determine limiting reactants and percent yields.

SPRING SEMESTER

UNIT 3: MATTER, ENERGY, AND EQUILIBRIUM

In this unit, students will explore reaction energy and thermochemistry, gaining a comprehensive understanding of the driving forces behind chemical reactions.

UNIT 4: ORGANIC AND NUCLEAR CHEMISTRY

Students will journey through diverse branches of chemistry, starting with Oxidation-Reduction reactions, equations, and identifying oxidizing and reducing agents. Next, students will learn about Nuclear Chemistry, including radioactive decay, nuclear radiation, and how to balance nuclear reactions. Finally, we will delve into Organic Chemistry, exploring organic compounds, hydrocarbons, functional groups, and organic reactions. Students will draw and model organic compounds, building on foundational knowledge from preceding units and explaining the rationale behind their shape and bonding.

UNIT 5: FINAL PROJECT

Final Project on Ocean Acidification and Salinity

