

MVHS Science Course Information 2023

	College Prep Chemistry	Chemistry Honors	AP Chemistry	College Prep Physics	AP Physics 1	AP Physics C
What is covered in this subject?	Chemistry explores the fundamental ideas of matter, energy and interactions through labs, modeling and problem solving. Topics include structure of atoms, bonding, types of reactions, solution chemistry, thermochemistry and nuclear reactions. We learn how micro level interactions (such as electrostatic attractions) can impact macro level properties (such as melting point) and have real life implications (such as melting ice on the roadways).			Physics aims to define and describe the most fundamental properties of the universe as well as the relationships and interactions between them. The courses cover topics that may include: kinematics (how things move), dynamics (why things move), energy and momentum conservation laws, rotation of objects, the motion of oscillating objects and waves, the interaction of charged objects, and electrical circuits.		
How is class time generally spent in each course?	In CP Chemistry, students begin the process of using scientific practices in designing analytical labs. Class time is spent in investigative labs, projects, direct instruction and practice. Students work in collaborative groups often. Class time is provided to introduce, practice, and review concepts. Content is similar in both CP Chem and Chem Honors.	In Chemistry Honors, concepts are explored to a greater depth than in CP Chem. Class is a blend of online and direct instruction. Class time is spent in investigative labs, projects, direct instruction and practice. Students work in collaborative groups often. Students are required to work independently (outside of class). There is a larger emphasis on quantitative computation and analysis than in CP chem.	In AP Chemistry, students are actively engaged in their learning by doing labs, solving problems and taking assessments. Class requires independent work.	In CP Physics, most time will be spent working with your lab group to investigate new concepts through in-class demonstrations and labs, make sense of the results, and apply what you've learned to solve problems. Most new concepts are explored collaboratively and summarized in class discussion as opposed to lecture notes.	During AP Physics 1 class, new content is introduced as part of the HW outside of class through the use of video lectures. In class time is spent working with your lab group to solve problems pertaining to the new content, explore content through labs, and prepare for exams.	During AP Physics C class, new content is introduced as part of the HW outside of class through the use of video lectures. In class time is spent working with your lab group to solve problems pertaining to the new content, explore content through labs, and prepare for exams.
What are labs like in each course?	In CP Chemistry, labs are designed to illustrate chemical concepts as well as develop analytical skills. Students handle common lab equipment like balances, burners and glassware. Emphasis is on experimental techniques followed by written and oral explanations.	In Chemistry Honors, labs are designed to illustrate chemical concepts as well as develop analytical skills. Students handle common lab equipment like balances, burners and glassware. Emphasis is on experimental techniques including accurate calculations and analysis following experimentation.	In AP Chemistry, students practice skills similar to college level labs and develop analytical skills.	In CP Physics, class will regularly include hands-on activities to explore new concepts, generally accompanied by a question packet. Roughly twice per three-week unit there will also be a more in depth lab requiring you to design and conduct your own experiment and organize the data in a meaningful way.	AP Physics 1 labs include assignments where you choose your own research topic within a general area of study, design and execute your experiment, create data tables using Word or Google Docs, create graphs using Excel or Google Sheets, and determine a conclusion based on your data. All labs are typed up.	In AP Physics C labs, you create your own data tables using Word or Google Docs, create your own graphs using Excel or Google Sheets, and briefly answer ten to twenty questions.
What are the Math Requirements of each course?	In CP Chemistry, students should have passed Algebra 1 prior to enrollment. You will use algebra on a regular basis.	In Chemistry Honors, you will need to be able to regularly and independently solve algebraic equations in the context of chemistry in addition to the CP Chemistry requirements. Students must have passed Algebra 1 with a grade of "B" or better	In addition to Chem Honors requirements, Alg II or Alg II/Trig is required. Math is often applied to make sense of concepts. Furthermore, if you have not taken a prior Chemistry class, a summer Chemistry course is strongly recommended	In CP Physics, you will use algebra on a regular basis. For example, you will regularly set up and solve equations for unknowns, as well as create and interpret graphs from data.	In AP Physics 1, you will use algebra, geometry, and advanced trig, and need to solve complex systems of equations. This course is very math dependent and impacted by your math ability. While completion of Algebra 2 is the requirement, ideally students have completed at least Algebra 2/Trigonometry.	In addition to AP Physics 1 requirements, you will be using calculus from the very start of the course, and so ideally should have already taken Calc AB or BC prior to enrolling.
What is HW like in each course?	Most homework is catching up on what is not completed in class. Expect around 1 hour of HW per week.	Expect around 4 hours of HW per week to learn new content, finish labs, and prepare for exams.	45 min-1 hour per weekday. Double the time if not coming from Chem Honors. Extra 2-3 hours per week to prepare for Exams.	Expect around 1 hour of HW per week to work on practice problems, finish labs and projects, and prepare for exams.	Expect around 6 hours of HW per week to learn new content, finish labs, and prepare for exams.	Expect around 6 hours of HW per week to learn new content, finish labs, and prepare for exams.

	College Prep Biology	AP Biology	AP Environmental Science	Physiology	Science & Society
What is covered in this subject?	Biology includes these major units: Ecology, Cell Biology, Genetics, Evolution, Human Physiology (including Sex Ed). Instruction in Claim - Evidence - Reasoning writing and some data analysis. Basic lab skills, extended dissection of fetal pig. There is also an emphasis on academic skills, test-taking skills, and growth mindset.	AP Biology goes into many of the same topics as freshman biology but in much greater depth. There is also an increased focus on biotechnology, biochemistry and experimental design with a lot more lab work. In contrast, Physiology focuses on the whole human organism including anatomy and function as well as health related topics.	AP Environmental Science is an interdisciplinary course. It includes topics from biology, chemistry, earth science, history, political science, and many others. There is a focus on human impact on the environment and identifying potential solutions.	This is a great class if you are interested in learning more about how the human body works—mind, body, and soul. With contemporary health issues guiding the course, there are many opportunities for personal application of content through projects, labs, and conversations. The goal is to learn, find things that interest you, and figure out the best way to increase your own happiness and health!	Science and society is a project based learning experience where students get the chance to work on a variety of projects that connect important scientific concepts with current societal issues. Example projects include creating a product to help someone with a genetic disorder, research and write an energy platform, create a podcast to build awareness around water quality and more.
How is class time generally spent in each course?	Class time is a mixture of in-class lectures, group and individual activities, and some lab activities.	Class time is generally spent in lecture, lab work or group problem solving. Students are provided with skeleton lecture notes that they will add to during lecture. They are trained in how to use and maintain a lab notebook.	Class time is a mixture of in-class lectures, group and individual activities, and lab activities.	Class time is a balance of lecture, individual activities, group activities, labs, projects and dissections - largely experiential learning.	Most of class time is spent working on projects for each unit. There will be a lot of collaborative work as teams work collectively on creating the products for each unit. There is also class time devoted to learning important science concepts and connecting them to societal issues.
What are labs like in each course?	The labs are typically at an introductory level, utilizing mostly non-toxic substances and clear instructions. There is some level of interpretation and data analysis involving tables, graphs, or spreadsheets. Students spend extensive time on the fetal pig dissection.	Almost a third of class time is lab work. Initially, labs are done with specific directions provided and eventually students progress to designing and conducting their own experiments. Lab notebooks are kept in place of formal lab reports.	Labs vary in the course, but most of them involve environmental testing, simulations, data driven labs, design based labs and more.	Labs vary throughout the year increasing in complexity - data analysis and interpretation, personal application and practice, and dissections.	Labs include engineering design of wind turbine blades, water quality tests, data analysis of campus trash, flame tests, and more.
What are the Math Requirements of each course?	There are no specific math requirements for College Prep Biology.	There are no specific math requirements for AP Biology. Students are expected to have completed freshman biology and have some familiarity with chemistry.	There are no specific math requirements for AP Environmental Science. Course includes practice with calculation questions in preparation for the AP exam. Students are expected to have completed biology and have some familiarity with chemistry. Two years of science is recommended but not required.	There are no specific math requirements for Physiology. Students are expected to have completed biology.	No math requirement for the course, all math beyond basic arithmetic will be reviewed if needed in class.
What is HW like in each course?	Students should expect an average of 30-45 minutes of homework per night. This may include watching video lectures and completing notes to accompany these lectures, worksheets to help students review and practice with content covered in class, exercises to help build scientific argumentation skills, and practice assessments	There is an average of 30-45 minutes of homework daily, most of which is reading the textbook. Other homework might include preparation for labs or analysis of lab results as well as practice problems. Very few assignments have immediate due dates. Students have flexibility to complete their work at the time that most suits their schedule.	Expect around 4-5 hours of HW per week to learn new content, finish labs, and prepare for exams.	Students should expect occasional homework assignments (not too much in comparison to other science classes). There are semester-long outside of class projects that students work on consistently outside of class time. Overall, expect there to be around 1 hour per week of homework.	This course is designed to have the majority of the work done in class with limited outside of class work. Students should expect a very low homework load.

Fremont Union High School District Graduation Requirements: 1 year life science, 1 year physical science.

UC/ CSU/ University Entrance Requirements: Minimum 3 years of science recommended.

For more information: Contact Michael Jordan, Science Department Lead: michael_jordan@fuhisd.org