Vista Ridge High School Honors Chemistry 2014 - 2015

**Instructor**: Mrs. Maze

**Room:** G106

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**Course Text**: Chemistry, Prentice Hall and <https://njctl.org/>

**Course Description:**

This course represents the first year in a comprehensive two-year sequence of chemistry. Students who elect to go on to the second year course, AP Chemistry, will be prepared to take the AP Exam at the end of that course. PSI Physics and Algebra are recommended pre-requisites to this course; the work done in PSI Physics is applied and expanded upon to explain macroscopic phenomenon through an understanding of the microscopic. The course is both quantitative and qualitative in nature, so mathematics will often be applied to the solving of problems.

Throughout the year, students will be involved in problem-solving activities on an individual, small group and large group basis. Through this process the ability to read and understand problems, break them down into their component parts and then create and present solutions will be developed.

These same skills will be developed with activities in the chemistry laboratory. In that case, problem solving will be done in real time with hands-on problems. Both analytical techniques as well as technological capability will be developed.

Students who have successfully completed this course will be well prepared for PSI Biology.

**Materials**: Please bring the following to class each day

* 3-ring Binder with dividers, loose-leaf paper AND several sheets of graph paper
* Pen (dark ink only) and Pencil
* Scientific Calculator or Graphing Calculator
* Planner
* 4-pk Expo Markers for personal use
* Colored Pens for Grading for personal use
* Sticky Notes or Flags (any size and color you prefer for personal use)
* Flash drive - at least 8Gb
* Recommended but not required: head phones, Mobile Device (cell phone, iPod, PSP, etc), index cards, highlighters, poster-making materials (glue sticks, markers or colored pencils, display board)

**Introduction to Flipped Chemistry: Chemistry Learning in the 21st Century** Given that we live in an ever-shrinking world in which graduates will be competing with students from other countries for jobs, we must strive to create individuals who will be competitive in a global job market. In order to do so, we endeavor to develop skills in our students that will equip them to be independent life-long learners who can adapt to meet any challenging task at hand. As a result, we require students to demonstrate a great amount of independence in accessing information and collaborating with their peers to master the content.

The following activities are included in the Chemistry course:

* **Instructional Video Podcast**: Students will view these videos at home on a computer, iPod, portable video device, cell phone, or DVD player. In these videos, students will see chemistry teachers from Falcon High School and Vista Ridge High School explaining Chemistry concepts and demonstrating scientific principles. Credit for viewing will be given by students showing their notes to their instructor, commenting on the class blog, sending a text message to polleverywhere.com or in some other method. Students will be instructed in class as to how they can access the instructional videos, but may prefer to access the same content using their textbook or other resource.
* **Worksheets and Bookwork**: Students will complete activities in class that contain material that corresponds with the assigned instructional video. Problems include descriptive chemistry, mathematical problems, and explanations of concepts. For Bookwork, students can outline the reading or answer the questions assigned. Credit will be given if the assignment is finished completely, the student checks the accuracy of their work AND can answer a few questions asked by the instructor about their approach to solving the problems.
* **Demonstrations**: Occasionally, the teacher will demonstrate a chemistry concept to a small group or the whole class. Credit will be given when the student writes a descriptive paragraph and diagram about the concepts demonstrated.
* **Laboratory Investigations**: Students will often conduct lab experiments during class. All safety and cleanup procedures must be followed. Credit will be given when a student completes the data collection (MUST be stamped by instructor at the time of completion), data analysis and answers the questions at the end of the lab. About once per quarter a full lab report will be required.
* **Tests**: All unit tests must be passed with a 85% or better or students must re-take exams. Honors chemistry tests are more rigorous and comprehensive than general chemistry, so careful reading of the textbook chapters and completion of each assignment will be especially important in preparation for the exam.

**Ticket to a Retake**

Each student has the option to retake each unit test once. More recent information will replace old information. If you want to retake a unit test, you must meet these conditions:

1. Have all assignments from the unit complete.
2. Complete the self-evaluation and test corrections from the original test.
3. Schedule a time before or after school to attend tutoring and retake the test.

**\*\*Note: Because you have the opportunity to retake any unit test or quiz, the test grades will NOT be curved! If you don’t know it on the date of the test, study a little more and retake it once you have mastered the material!**

**Grading:** Within each unit of study are a set of Learning Objectives, LOs, which define the standard set of knowledge and skills each student must master. Students be ranked in their learning as they progress towards mastery on a scale from 0 – 4. These are formative assessments, meaning they change as students demonstrate each skill with more accuracy and consistency. This allows all invested parties (student, teacher, parent, counselor, admin, etc.) to identify strengths and areas for growth. Labs and quizzes are worth 30 – 50 points and tests are worth 100 points, so these assessments have much more impact on the student’s grade than the LOs. Overall letter grades are assigned based on the following scales.

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| --- | --- | --- |
| **Grading Scales** | | |
| **Letter Grade** | **Scale Score** | **Percentage Score** |
| A+ | 4.0 | 100 |
| A | 3.5 | 95 |
| A- | 3.0 | 90 |
| B+/B/B- | 2.5 | 80 |
| C+/C/C- | 2.0 | 70 |
| D+/D/D- | 1.5 | 65 |
| Failing -  Lack of understanding | 1.0 | 50 - 60 |
| Incomplete -  Not enough information | Below 1.0 | 50 |
|  |  |  |
| Modified from 2008 Marzano | | |

**Our focus is on student learning.** Tutoring will be available for students who need extra help.Retakes of all major assessments are encouraged so that the emphasis is on what students learn and not when they learn it and not allowing students to fail by constantly encouraging them to keep trying. Learning the material is the responsibility of each individual student, therefore completing the assignments is up to YOU, the student. Not everyone will require the same amount of practice to master the content of the course, but because of the academic rigor of this class, most students have to complete every assignment to be successful. Each student must complete his or her own work. Students found to be copying assignments or labs will be required to redo the work on their own time and may have “Academic Dishonesty” notated on their high school transcript. **Students who have good study habits are more successful in class. DO YOUR WORK ON TIME! Procrastination will kill your chemistry grade.**

**Tutoring Schedule**

Chemistry…………….……………………... Monday through Thursday 2:45 - 3:45 in G106

Linear Physics……………………………… Monday through Thursday 2:45 - 3:45 in G111

Biology ………………………………………. Monday through Thursday 2:45 – 3:45 in G109

**Attendance**: You are expected to attend class on each scheduled day. Chemistry is a tough class to miss and make up because the interactions in the classroom enhance the learning process and cannot be recreated. Each class begins with a 3-5 minute activity, called the Warm-Up. If you need more time to work out the problems, you should come early because when the time runs out, we start grading! You will receive a warning for your first tardy, but after that, a three-strike policy will be enforced. If you are late three times, you will be expected to make up the time you missed by serving after school detention as well as any other consequences outlined by the student handbook. **BE ON TIME!!!**

**Make Up:** Some labs are not possible to keep out for weeks on end. Once chemicals begin to decompose, they must be neutralized and discarded. For this reason, you may need to schedule time outside of class to complete labs if you fall behind. You may be working with another teacher or lab group during the makeup lab, but you are still responsible for turning in the lab write-up within one week. Those who come for lab day without the pre-lab assignment complete will be asked to complete the lab another day because they have not sufficiently reviewed the procedure to perform the lab safely. It is possible that the lab must be cleared away and a student must forfeit the points and the learning opportunity, or complete an alternate assignment.

**What can Parents Do To Help:** Studies show that the most successful students around the world have parents who TALK to their kids! When they are young, reading out loud to your kids has enormous benefits. As they get older, talking to students about current events, books, movies, and social issues is one of the best ways to impact their learning at school. So instead of asking “Did you do your homework?” (and starting a battle!), consider trying “Tell me your thoughts on the upcoming election.” or “What did you think of the way Maleficent was portrayed in that movie?” Thank you in advance for the encouragement and support you provide for your child this year.

**Class Rules:** In order to maintain a safe and orderly environment conducive to learning for all students, there must be discipline and structure in the classroom.

1. Be prepared for class and working when the bell rings.
2. Follow classroom procedures and directions the first time.
3. Keep words and actions respectful at all times.
4. Refrain from distracting behaviors.
5. Be aware of all safety rules and signs for this chemistry lab. Remember that we may be working with volatile substances and that these rules are set up for your safety.

**Course Content Outline**

Unit One: The Wave Nature of Matter (Review from Physics)

1. The Wave Nature of Light
2. Photons and the photoelectric effect
3. The Nature of Matter – Wave-Particle Duality

Unit Two: Atomic Structure

1. Dalton’s Atomic Theory
2. Subatomic Particles
3. Ions, Isotopes, and Average Atomic Mass

Unit Three: Locating Electrons and the Periodic Table

1. Emission Spectra and the Bohr Model of the Atom
2. The Quantum Mechanical Model of the Atom
3. Electron Configurations

Unit Four: Periodic Trends

1. Review of Coulombic Attraction (from Physics)
2. Periodic trends
3. Atomic size
4. Electronegativity
5. Ionization Energy
6. Valence electrons and periodic trends

Unit Five: Ionic Bonding and Ionic Compounds

1. Formation of Cation and Anions
2. Formation of Ionic Compounds
3. Properties of Ionic Compounds
4. Naming of Ionic compounds

Unit Six: Covalent Bonding and Molecular Compounds

1. Covalent bonding
2. Properties of Ionic Compounds and Molecular Compounds
3. Naming of molecules
4. Lewis Structures
5. Molecular shapes (the VSEPR model)\*
6. Polarity of molecules

Unit Seven: Chemical Reactions

1. Balancing chemical equations
2. Classifying chemical reactions

Unit Eight: Nuclear Reactions

1. Radioactive Particles
2. Types of Nuclear Reactions
3. Balancing Nuclear Equations
4. Half-Life and Radioactive Decay
5. Applications of Nuclear Chemistry

**Fall Semester Final December 15 – 19**

Unit Nine: Predicting Products of Reactions

1. Use of solubility tables to predict reaction
2. Use of activity series to predict reaction
3. Net ionic equations
4. Oxidation-Reduction reactions
5. Combustion Reactions – completing and balancing

Unit Ten: Scientific Measurement

1. Scientific Notation
2. Error, Accuracy, and Precision
3. Significant Figures
4. Metric Conversions
5. Density
6. Dimensional Analysis and T-Tables

Unit Eleven: Moles and the Periodic Table

1. Avogadro’s Number
2. Converting between number of atoms and moles of an element
3. Converting between volumes and moles of gas at STP
4. Converting between mass and moles of an element
5. Empirical Formula
6. Molecular Formula

Unit Twelve: Stoichiometry

1. Mole Ratios
2. Predicting Amounts of Products and Reactants
3. Limiting Reagent
4. Percent Yield

Unit Thirteen: Solutions

1. Concentration units
2. Saturated solutions
3. Factors affecting solubility
4. Acids and Bases

Unit Fourteen: Gases, Liquids and solids

1. Kinetic – molecular Theory
2. The ideal gas law
3. Gas density and molar mass
4. Dalton’s law of partial pressures
5. Graham's law of Effusion

\*Unit Fifteen: Thermochemistry and Thermodynamics

1. Specific Heat and Calorimetry
2. Hess’s Law and Enthalpy
3. Entropy
4. Gibb’s Free Energy

\*Unit Sixteen: Chemical Equilibrium

1. The equilibrium constant: forward and reverse rates of reaction
2. Calculating Kc and Kp
3. Le Chatelier’s Principle

**\*Designates units of study required for Honors Chemistry**

**Spring Semester Final May 19 – 22**