Dougherty High School AP Chemistry Syllabus
AP® Chemistry Class Policy

- **Instructor:** Mrs. Farmer
- **Email:** sfarmer@srvusd.net, School Loop email is typically faster
- **Mrs. Farmer's website:** www.mychemistryclass.net
- **Sign up for REMIND APP:** download REMIND APP to join @apchemfarm class (or txt @apchemfarm to 81010)

Textbook -

Chemistry, A Molecular Approach 4th Ed. – Tro – Pearson Prentice Hall – *e*text
Mastering Chemistry – Online supplement to the course

Laboratory Experiments

The laboratory experiments represent a collection of labs from various sources

- Flinn Scientific Inc. Advanced Placement Chemistry Laboratories
- College Board AP® Chemistry: Guided-Inquiry Laboratories
- Juniata College, Science in Motion, Advanced Placement Labs
- Advanced Chemistry with Vernier

Overview of AP Chemistry Program

Dougherty Valley HS offers three sections of AP Chemistry. The class meets four (4) days a week including one 88 minute block period. This block day is devoted for lab experiments; Inquiry and normal experiments plus a second day (51 min period) as needed. Throughout the school year, 25%**+** instructional time will be devoted towards laboratory experiments. The other days are geared towards lectures, practice problems, experiment continuation, and interactive activities.

AP Chemistry is a 2nd-year course. You should have already completed Honors Chemistry
<The ***expectation*** is that all AP Chemistry students will sign up and take the AP Chemistry Exam>

Course Description:

AP Chemistry is designed to be the equivalent of the general chemistry course usually taken during the first year of college. The goal is to provide the student with a strong background in many of the basic topics covered in chemistry. The objective of this class is to prepare each and every student to be successful on the AP Chemistry Exam given by the College Board in May. **Please note, an actual college chemistry class would involve more hours of instruction time per week than our current schedule, to compensate, additional time, outside of scheduled class time, will be required. This includes two Saturdays in April prior to the exam. Finally, if you do not have several hours each week to devote to lab reports, homework, and studying do not take this class.**

Since this is a second year course, students have a sound previous knowledge of:

Δ Atomic Theory	Δ Molar Relationships	Δ Electronic Structure
Δ Periodicity	Δ Molecular Geometry	Δ Gas Laws
Δ Solutions & Colligative Props.	Δ Nuclear Chemistry	Δ Intra/Intermolecular bonding

The following concepts' increase in complexity or unfamiliar nature makes it necessary for more time covering them:

Δ Equilibrium	Δ Chemical Kinetics (Mechanisms, Integrated)	
Δ Thermodynamics (2nd Law, Gibbs)	Δ Redox Reactions (Electrochemistry	Δ Organic Chemistry
Δ Buffer, Acid-Base, Titrations	Δ Coordination Complexes	Δ Materials Science

Classroom Behavior and Rules: - *The DVHS Student Handbook is governing for Policies and Procedures*
The student is expected to:

1. Follow safe lab procedures and practices. Details will be forthcoming as safety is the number one priority.
2. Be on time, be organized, be prepared. Have pencils, pens, paper, textbook, and lab book in class when needed.
3. Be respectful and courteous of self, fellow classmates, your room, and your instructor. Comments concerning race, religion, appearance, or sexual preferences are unacceptable in this classroom.
4. Cheating will not be tolerated will result in a zero (**0)** for the assignment and can lead to further disciplinary actions. This includes copying homework, lab reports, and any misconduct during assessments.
    a. Any and All electronic devices except non-graphing calculators during assessments is prohibited
5. The use of any and all electron devices, excluding calculators, is prohibited during class time.
6. All other rules outlined in the Student Handbook are in effect.
7. Be **R**esponsible, Be **R**espectful, Be **R**esourceful

Grades:

Grades are used to evaluate how well the student has understood the course content. Exams, quizzes, homework, and labs are designed to reinforce concepts and their applications. Specific laboratory report and homework formats will be discussed in class. All assignments are due at the beginning of the period. If a student has an excused absence, homework will be due the day the student returns to class. The class is not graded on a curve; each student determines his or her own grade based on how many points they earn. Grades will be calculated each semester and are based as follows for the 1st semester:

Graded Work:

All evaluated classwork and homework is due at the beginning of the period of the day on which it is due unless specified otherwise. There will be **NO** credit given for late work. **[**Dougherty Valley High School will be following the District Homework Policy (AR 6154 and BP 6154), please see the Homework Policy on the District Website as well as the Dougherty Valley High School Web Site**] Please be advised that this policy is/can be different for Honors/AP Course**

Mark your Calendars: AP Chemistry Test Date → **THURSDAY MAY 7th @ 8AM**

Percentage of Class (Approx.)	Category
60%	Unit Tests, Mid-term, Semester Finals*Δ
20%	Lab Reports and Long Term Assignments Formal Lab Reports (one per week based on lab performed during an 88 minute block) Informal Lab Reports → 25% of instructional time
15%	Quizzes (Lowest score dropped)
5%	Classwork/Homework

*****Very important part of the class. These tests will prepare you for the AP Exam in MAY

Δ During all assessments, no electronic device may on your person. All electronic devices will be put into the "cell phone parking lot at the front of the room. When/if any electronic device is found on the students' person it will be assumed cheating on the assessment and the student will earn zero (0) credit for this assignment with no opportunity for a make-up. The teacher will return all electronic devices at the end of the testing period.

College Grading Scale*^	
Percent (%)	**Grade**
90	A
80	B
70	C
60	D
59 and below	F

*****not on a curve. ^See page 9 for DVHS grading scale

These percentages are similar to a normal class. If you cannot perform on the tests you cannot get a good grade. Progress reports will be sent home mid-quarter as well as at the end of each quarter. Parents are welcome to email me about their students' progress at any time. See full grading scale below.

Email is the **BEST** way for communication

Classwork/Homework

Grades in this category will be based on either completion or accuracy. Participation in class discussions and/or activity based work may also be graded. Work is not defined as only "worksheets." Finally, points will not be earned if not working on the task assigned includes doing work for another class. Playing video games on your calculator is not a productive activity! Be on task, productive, engaged – those are all part of doing your classwork.

Attendance:

Daily attendance is essential to the students' ability to stay current with the topics covered in class. If the student is absent, it is his or her responsibility to find out what was missed. Assignments that were due on the absent day are due when the student returns to class. Labs, quizzes, or tests missed due to an excused absence must be made up upon returning to class. *Please note that in order to be successful in this class additional time at lunch or after school could be required*. Make-up work is to be completed and turned in within the same length of time as the absence. If the length of the absence is exceeded, the work will not be accepted. It is your responsibility to find out about make-up work as well as make-up tests or quizzes. You will choose 2 "study buddies" in class whom you can call to find out such information. **Make-up assessments are given the day you return during your class period unless otherwise determined (they will be different format or questions, but will cover the same material)**. Any assignments or tests due on the day of a cut will receive a score of zero.

Labs:
Separate handouts concerning laboratory procedures and safety will be passed out and discussed in class. All students are required to have a **laboratory notebook** that makes carbon copies of each lab. Lab notebooks will be provided. Lab notebooks may be collected at the end of the semester and checked for write-ups on informal labs and demonstrations. **Our 88 min block period along with an additional 54 min block may be needed and could be devoted exclusively to performing hands-on labs. A formal lab report will be written for each of these labs.**

Lab Report Guidelines: A more detailed explanation of expectations and of each section will be given to you in class.
Each Formal Lab Report will consist of the following sections:

- Title
- Abstract (no more than 5 sentences summarizing each major section of the lab report)
- Introduction
  - Background Information (written in Ss own words)
  - Hypothesis
  - Problem to be answered
  - Equation(s)
- Experimental Procedure Followed during the experiment
  - What steps were followed
  - When to record observations
  - Diagram of apparatus (if needed)
- Data Table(s) to organize observations and measurements
- Calculations/Analysis
  - Show all calculation including units
  - All Symbols defined
  - Graphical Data - Titles, Labeled Axis, Slope calculations
- Discussion – Analysis of the Experiment
  - Post Lab questions and follow-up
  - Explaining how lab and results bring concepts together
- Conclusion
  - Report your results and try to tell why it turned out the way it did
  - Discuss how your results demonstrate basic principles of chemistry
  - Describe any errors that occurred during the experiment that may change your outcomes
- References
  - List all sources, e.g. lab manual, textbook, course packet, etc.
- Appendix
  - With a table of contents listing the items in the Appendix, include any paperwork used to prepare or used while performing the lab, such as any pre-lab worksheets, lab handouts or protocols, notes taken during the lab, etc.
- Organization/Formatting

Final Note:
The best way to make this course a success for yourself is to ask questions, spend time reading the book, take notes, participate in discussions, and work as many problems as possible over and beyond those assigned for homework. Problem solving in chemistry is a skill that can only be improved by practice. If you do not spend time on the homework you will not be successful when taking tests. I am excited about this year. I love chemistry and my hope is to get many of you to love it as well. Do not hesitate to ask for help. I am here to help you learn.

Summer Assignment
Here is a link to the full AP Chemistry Summer Assignment. https://tinyurl.com/y6wclmu5
Overview of Summer Assignment:

REMEMBER
☐ Everything from Honors Chem! AP Chem mixes all topics together, your background knowledge in the Honors Chem topics is essential because they will appear inside other chapters starting the first week in AP!
☐ All my Honors Chem materials are on the class website! (www.mychemistryclass.net → Honors Chem)
KNOW
☐ Solubility Rules, Common Ions, VSPER
☐ All Reference Pages are on the class website (www.mychemistryclass.net → AP Chem → Reference Sheets)
REVIEW
☐ Stoichiometry, Kinetics, Equilibrium, Acid Base – **large part of AP CHEMISTRY!**
LEARN
☐ A little bit of Redox chemistry. We no longer have time to teach this in the Honors Chem class unfortunately. The practice work linked below will have some resources for you to learn a little bit about this chapter.
☐ Any topics on the next pages marked with a (*) as these may not have been taught in recent Honors Chem years due to a variety of reasons.
☐ Any topics on the next pages that you missed due to absences, taking Honors Chem at a different school, etc.
PRACTICE **TURNED IN ON 1ST FRIDAY OF THE YEAR!**
☐ Summer Practice Problems – Link on next page
☐ Print worksheet and complete on binder paper, and correct (answers are linked at the top of the worksheet)
☐ Show work if you want credit!
CHECK **TURNED IN ON 1ST FRIDAY OF THE YEAR!**
☐ Complete Self-Assessment Quiz for Ch. 1-4 once you have access to the online textbook. ○ Link on next page ○ Print and complete. Answers at bottom to check/correct work. ○ Show work for math problems. ○ Annotate non-math problem → show/explain your thought process behind your answer choice.

See "Course Outline" on page 7 for order class will following during the year

Unit	Description Content Skills	HW	Labs/Activities Δ=Inquiry ⊗=Normal
I: *Review Unit* *Ch. 1, 2, 3, 4* 2 weeks	**Unit 1 is a review unit**: This is material well covered in Honors Chemistry and by the summer assignment other students are required to complete • *Matter and Measurements*: Classifying matter, dimensional analysis, and significant figures • *Atoms, Molecules, and Ions*: Atomic structure, formula writing, nomenclature, oxidation states, etc. • *Stoichiometry*: Mole, atomic weight, molecular formula, balancing equations, limiting reagents, empirical formulas, percent composition, percent yield, and solution • *Aqueous Reactions and Solution Stoichiometry*: Precipitation (net ionic), acid-base, redox, concentrations.	Approx. 20- 30 Book Q's per week Worksheets practice problems Old FRQ's	⊗Analysis of Silver in an Alloy – *Exp. 2 FLINN* Δ#3: What makes Hard water Hard? – You will design and perform an experiment using gravimetric analysis to determine the stoichiometry of the reaction. You will create a precipitate in a chemical reaction, which you will separate from the solution via vacuum filtration using Buchner funnels (SP 1-7) Chemicals Reactions Video Activity (**BI - #3**): You will make a narrated video for chemical reactions, showing how atoms are rearranged and/or reorganized
II: *Gases* *Ch. 5* 1.5 weeks	• ***Gases***: Ideal gas law, van der Waal's equation, Avogadro's Law, STP, Dalton's Law, Graham's Law, kinetic theory of gases, real vs. ideal gases, etc… • **Chemical Reactions**	Approx. 20- 30 Book Q's per week Worksheets practice problems Old FRQ's	⊗#5: **The molar Volume of a Gas –** You will react Mg ribbon with HCl in a eudiometer tube to collect gas in that sealed tube over water. Taking measurements of mass, volume, and temperature, you will then determine what is the dry molar volume of that gas (SP 1-7)
III: *Thermochemistry* *Ch. 6* 1 week	• ***Thermochemistry***: The nature of Energy, Enthalpy, Thermodynamics of Ideal Gases, Calorimetry, Specific Heat, Hess's Law, Standard Enthalpies of Formation (but not calculating ΔHrxn from them) • **Chemical Reactions**	Approx. 20- 30 Book Q's per week Worksheets practice problems Old FRQ's	⊗#13 Determine the Enthalpy of a Chemical Reaction – You will use computer temperature probes to measure that heat released from 3 chemical reactions that you will perform. Two of those reactions can be added in some way on paper to get the 3rd reaction. You will verify that Hess's Law holds by comparing your heats of reaction from 2 of the reactions to the heat of reaction of the 3rd since the 1st two should add up to equal the 3rd. (SP 1-7) Δ#12: The Hand Warmer Challenge – You will design and perform an experiment using knowledge of calorimetry to design a hand warmer that will release energy based on given specifications using provided ionic compounds that are soluble in water (SP 1-7)
IV: *Bonding and Molecular Structure* *Ch. 8 + 9* 2 weeks	• ***Chemical Bonding***: Chemical bonds, Electronegativity, Bond polarity and Dipole moments, Ions: E.C. (but not the exceptions), and sizes, formation of Binary ionic compounds, partial ionic character of covalent bonds. The covalent chemical bond: A model, covalent bond energies and chemical reactions, the Localized electron bonding model, lewis structures, resonance, exceptions to the octet rule, molecular structure: The VSEPR model. **hybridization** (not including 'd' orbitals) • **Chemical Reactions**	Approx. 20- 30 Book Q's per week Worksheets practice problems Old FRQ's	**VSEPR Activity (BI - #2)**: You will be given a list of chemical formulas and prepare 3D models to the various electro pair arrangements, and complete a table, which shos the Lewis Structure, electron-pair geometry, molecular structure, and use that information to predict the presence or absence of a dipole moment. You will build the molecules using gumdrop candy and toothpicks, taking into account how the lone pairs of electrons affect the shape.
V: *Periodic Table, Atomic Structure* *Ch. 7* 1.5 weeks	• ***Atomic Structure***: Atomic spectra, Bohr atom, quantum numbers, molecular geometry, hybrid orbital's, electron configurations, periodic table, trends in the periodic table in terms of physical and chemical properties • **Chemical Reactions**	Approx. 20- 30 Book Q's per week Worksheets practice problems Old FRQ's	Periodic Trends Graphing Activity (**BI - #1**) – You will graph "Atomic number vs XXXX" and interpret several data sets on atomic properties. Student will then discuss trends as they contribute to PES diagrams in identification of compounds. Spectroscopy and Electron Configuration. Students will perform flame tests of various ionic compounds to see with spectroscopes the spectra that the metal elements produce. You will record those spectra, calculate their frequencies and energies, and determine the identity of an unknown by comparing to the spectral fingerprints you have recorded. (SP 1-7) Δ#1: What is the relationship between the concentration of a solution and the amount of Transmitted light through the solution – You will design and/or interpret the results of an experiment regarding the absorption of light to

			determine the concentration of an absorbing species in a solution (SP 1-7)
VI: *Intermolecular Forces, Solids, Liquids* *Ch. 10* 2 weeks	• ***Intermolecular Forces, Liquids, and Solids***: Dipole–dipole interactions, hydrogen bonding, London forces, liquid state, types of solids, metallic bonding, network solids, vapor pressure, change of state, phase diagrams • **Chemical Reactions**	Approx. 20- 30 Book Q's per week Worksheets practice problems Old FRQ's	Δ#5: Sticky Q: How do you separate molecules that are attracted to one another? – You will design and/or interpret the results of a separation experiment in terms of relative strength of interactions among and between the components.(SP 1-7) ⊗Determining Melting Temperature - You will use a Vernier Melt Station to determine the melting temperature of a solid substance. Your sample will be one of several possible pure compounds. On subsequent trials you will be able to accurately determine the melting temperature of your sample, thus identifying the compound (SP 1-7)
VII: *Properties of Solutions* *Ch. 11* 2 weeks	• ***Properties of Solutions***: Electrolytes and non-electrolytes, molarity, molality, mole fraction, colligative properties, Raoult's Law, Henry's law, freezing point depression, boiling point elevation, and osmotic pressure. • **Chemical Reactions**	Approx. 20- 30 Book Q's per week Worksheets practice problems Old FRQ's	Δ#4: Using Freezing-Point Depression to Find Molecular Weight – You will determine the molar mass of a solute by Freezing it. From the Freezing point depression and knowledge of the molality of the solution you will be able to calculate the molar mass of the solute compound (SP 1-7) ⊗ Identification of Solutions – Juniata
VIII: *Chemical Kinetics* *Ch. 12* 2 weeks	• ***Chemical Kinetics***: Reaction Rates, Rate laws: an introduction, determining the form of the rate law, the integrated rate law, rate laws: a summary, reaction mechanism, the steady-state approximation, a model for chemical kinetics, catalysis • **Chemical Reactions**	Approx. 20- 30 Book Q's per week Worksheets practice problems Old FRQ's	Δ#11: What is the rate law of a the fading of Crystal Violet using Beer's Law – You will use computers with spectrameters to observe that progress of a chemical reaction that involves a color change. By monitoring that rate of change in the absorbance's of light through the reaction sample and using Beer's Law, you will design how to determine the rate of the reaction and its order and perform the experiment (SP 1-7) ⊗ Iodination of Acetone – The purpose of this reaction is to determine the orders for the reactants, the rate expression, and the rate constant for the reaction between iodine and acetone. – Junitata Kinetics Graphing Activity (**BI - #4**) – You will determine the order of a reaction, rate law, rate constant, and half-life through the graphing of given concentration vs. time data for a reaction
IX: *Chemical Equilibrium* *Ch. 13* 2 weeks	• ***Chemical Equilibrium***: Equilibrium constant, equilibrium expressions, calculations of K and equilibrium concentrations, Le Chatelier's principle, and how equilibrium is shifted by temperature, concentration, ICE tables, **intro to complex ions**, etc… • **Chemical Reactions**	Approx. 20- 30 Book Q's per week Worksheets practice problems Old FRQ's	Equilibrium "Red Rover" **Activity** (**BI - #6**) – You will play a "game" in which the parts of the class (separated initially into 2 groups), switch places based on different conditions called out Δ#13: Can we make the colors of the rainbow? – You will design and perform an experiment to investigate Le Chatelier's principle by testing several systems at equilibrium and then selecting specific ones to produce the colors of the rainbow based on specific applications of this principle (SP 1-7) Δ#15: To what extent to common household products have buffering activity? (SP 1-7) ⊗#10: Determination of K_{eq} for $FeSCN^{2+}$ - you will prepare a new series of solutions that have varied concentrations of the Fe^{3+} ions and the SCN^- ions, with a constant concentration of H^+ ions. You will use the results of this test to accurately evaluate the equilibrium concentrations of each species. (SP 1-7)
X: *Acid / Base* *Ch. 14 + 15* 2.5 weeks	• ***Acids-Bases***: pH, K_a and K_b expressions, titration, degree of ionization, K_w expressions, indicators, equivalence points, Arrhenius, Brønsted-Lowry and Lewis acid theories, and salt hydrolysis • ***Aqueous Equilibria***: Common-Ion effect, buffers, factors affecting solubility • **Chemical Reactions**	Approx. 20-30 Book Q's per week Worksheets practice problems Old FRQ's	⊗#8: An Oxidation-Reduction Titration: The Rx. Of Fe^{2+} and Ce^{4+} - You will conduct an oxidation-reduction reaction in this experiment in order to determine the amount of iron (II) ions in a solid sample of ferrous ammonium sulfate hexahydrate. (SP 1-7) ⊗#23: Determination of the Solubility Product of $Ca(OH)_2$ – Your primary objective in this experiment is to test a saturated solution of calcium hydroxide and use your observations and measurements to calculate the K_{sp} of the compound. You will do this by titrating the prepared $Ca(OH)_2$ solution with a standard hydrochloric acid solution. (SP 1-7) ⊗ Determination of the Lead Content in Water.

			You will add varying amounts of potassium iodide in water from different sources to determine the concentration of lead ions originally dissolved within. Analysis will require performing calculations with the Ksp of the slightly soluble lead iodide precipitate. (SP 1-7) Whole-Class Discussion of the Societal Impact of Lead Content in Water (Societal Impact of Chemistry). You will research and use that research in a whole-class discussion regarding the societal impact of lead content in water (tied in with the experiment described in the previous bullet).
XI: *Chemical Thermodynamics* *Ch. 16* 2 weeks	• ***Chemical Thermodynamics***: Spontaneous process and entropy, isothermal expansion and compression of an ideal gas, entropy and physical changes, entropy and the 2nd law. The effect of T on spontaneity, entropy changes in chemical reactions, the dependence of free energy on P, free energy and equilibrium • **Chemical Reactions**	Approx. 20-30 Book Q's per week Worksheets practice problems Old FRQ's	⊗#26 The Enthalpy of Neut. Of H_3PO_4 "Spontaneous or Not? **Activity (BI - #5**. – You will be given a set of data and will practice predicting and justifying the signs of ΔHrxn, ΔSrxn, and ΔGrxn. You will also determine the effect of varying temperature on those signs
XII: *Electrochemistry* *Ch. 17* 2 weeks	• **Redox & *Electrochemistry***: Oxidation and reduction half-cells and equations, electrolysis, electrochemical (voltaic) cells, standard voltages, standard voltages from a table, Nernst equation, Faraday's laws, writing redox equations, and balancing equations in acid/base solutions • **Chemical Reactions**	Approx. 20-30 Book Q's per week Worksheets practice problems Old FRQ's	⊗Electrochemistry: Voltaic Cells: You will construct voltaic cells to use voltmeters to determine the cell potentials for a series of metals and compare them to what your calculations of redox potentials say the potentials should be (SP 1-7) Δ#8: How can we determine the Actual %'age of H_2O_2 in a Drugstore Bottle of H_2O_2? (SP 1-7) ⊗Electroplating a Nickel ⊗Electrolysis of KI
XIII: *Nuclear Chemistry* *Ch. 18* <1 week	• ***Nuclear Chemistry***: Nuclear Stability & Radioactive Decay, Nuclear Transformations, Thermodynamic Stability of the Nucleus, fission & fusion. • **Chemical Reactions**	Approx. 20-30 Book Q's per week Worksheets practice problems Old FRQ's	Alpha, Beta, Gamma Activity
XIV: *Organic Chemistry* *Ch. 22* <1 week	• ***Organic Chemistry***: Naming, alkanes, alkenes, alkynes, functional groups, reactions involving hydrocarbons • **Chemical Reactions**	Approx. 20-30 Book Q's per week Worksheets practice problems Old FRQ's	Nomenclature, drawing compounds, model building
XV: *Review for AP Test*	In the weeks prior to the exam the students will their **final exam** (currently the released exams) to get students acquainted with the test and to evaluate their knowledge. Review sessions include practicing FRQ from previous years.	Review	

Course Outline (approx.)					
Semester I			**Semester II**		
Big Idea	**Chapters in Test**	**Unit from Above**	**Big Idea**	**Chapters in Test**	**Unit from Above**
Review	**1 – 4**	**I**	**2 Gases,**	**5**	**II**
5	**6, 17**	**III, XI**	**2 Solutions**	**12**	**VII**
4	**13**	**VIII**	**6 (Acid-Base)**	**15, 16**	**X**
Mid-Term Exam			**3 (Electrochemistry)**	**18**	**XII**
6 (Equilibrium)	**14**	**IX**	**Mock AP Exam (mid-term)**		
1	**7, 8**	**V**	**If time – Organic**	**20**	
2 (Bonding)	**9, 10, 11**	**IV, VI**			
Final Exam			**Final Exam (MOCK AP TEST)**		

DOUGHERTY VALLEY HIGH SCHOOL 2019-2020 GOALS

1. All students have the opportunity to access the full curriculum, extra-curricular activities, and community involvement.
2. Actively apply and strengthen relationships that foster respect and value diversity in a safe, clean and caring environment.
3. Staff will support students with special needs through collaboration, consistent communication, and professional development.
4. Implement consistent practices that provide a welcoming and responsive environment for students, staff, parents, and community.

ACADEMIC HONESTY POLICY

Honest behavior is an expectation at DVHS. The purpose of the policy is to create and maintain an ethical academic atmosphere in which strong behavioral consequences will be enforced. Teachers also address cheating and plagiarism in their course policies. **Counselors will be notified of the incident and it may be disclosed on a student's college application. Staff will access *Turnitin.com* to review plagiarism information taken from websites.**

- Copying from another student
- Unauthorized collaboration on assignment
- Using unauthorized materials/resources (spark/cliff notes, cell phones, calculators, etc.)
- Submitting an essay written in whole or in part by someone else as one's own
- Preparing an essay or assignment for submission by another student
- Copying an assignment or essay or allowing one's assignment or essay to be copied by someone else
- Using direct quotations, large sections or paraphrased material without acknowledgement
- Buying or selling essays or assignments
- Submitting whole or part of computer-generated documents or materials with or without minor modifications as one's own

Consequences for Academic Dishonesty will include appropriate disciplinary measures consistent with Board policy and the California Education Code. One or more of the following consequences may occur. Disciplinary consequences will be cumulative for only the current school year per class and will be noted in students discipline file.

Examples include, but are not limited to:

1. Parent /Guardian contacted by teacher
2. Referral to assistant principal for disciplinary consequences; parent/guardian will be notified.
3. Loss of all credit for the assignment or test with no makeup permitted.
4. Upon second violation of 2nd degree cheating within the same course, the student may be dropped from the class.
5. Monday School (3 hours)
6. Suspension from school

Please see the DVHS Student Handbook for complete list of consequences for 1st, 2nd, and 3rd Degree offenses.

NOTE

To be successful in Chemistry you must attend class regularly. No student will fail this class if they attend class, make productive use of time, turn in all assignments on time, take all tests and quizzes, complete labs and projects, and above all put forth a strong EFFORT.

- *EFFORT = SUCCESS*

Extra Help

Please see OFFICE HOURS posted by my door. ACCESS on Wednesday and Thursday are so important!

SCHOOL POLICIES & PROCEDURES – *All policies/procedures will be followed from the DVHS Student Handbook*

All school rules, policies, procedures, and disciplinary actions will be followed.
Please see the student handbook for further information.
Staff Communication Policy: Email is the best way to reach me
As a guideline, any communication to staff, via email or telephone, should receive a response within 48 hours (excluding weekends and holidays). If there is no response within 48 hours, please email or call again stating this is the second attempt. The 48-hour guideline may be affected by illness, conferences, or technology problems.

Line of Communication:
Any questions or concerns regarding student progress in a class should be addressed through the following process:

1. Student communicating with teacher
2. Parent communicating with teacher
3. Parent/Student communicating with counselor
4. Parent/Student communicating with Assistant Principal
5. Parent/Student communicating with Principal

Textbooks:
Students are loaned a textbook based on the specific subject. The student and the parents are held financially liable for lost, stolen, damaged or destroyed textbooks. Students are charged the full replacement cost for items lost or damaged, since the school must pay the full replacement cost. All outstanding bills must be cleared before yearbooks, schedules, report cards or textbooks are issued to a student.

Possession of Electronic Devices, MP3 Players, Cell Phones, Laser Pens at School:
Possession of ANY electronic devices, including but not limited to cell phones, by a student at school is a privilege, which may be forfeited by any student who does not follow the pertinent school rules, district rules, and/or Electronic Device Policy below. ANY electronic devices (cell phones, iPODS, MP3'S, video players, PSP's, games, etc) may only be used before and after school and during lunch and brunch. ANY and ALL **electronic devices are to be in the off mode and are not to be used, heard, or visible during class, passing periods, in the library, or computer labs.** Students may not use electronic devices if they leave the classroom to use the restroom, go to counseling, etc. **Use of cell phones is prohibited in the locker rooms and bathrooms at all times. Any electronic device violation during the school day will be subject to call or text/voice message search by administration. The district/school shall not be responsible for the loss of or damage to a cellular phone, iPOD, or electronic device brought on campus.**

First Offense: Device confiscated until the end of the day. Parent called, **Detention** assigned.

Second Offense: Device confiscated, parent will be called. Device returned when contact has been made with parent. **Monday School** assigned.

Third Offense: Device confiscated, parent contacted and **Suspension** assigned. Further consequences may result in suspension. Student loses ability to have device on campus for the remainder of the semester.

DVHS Grading Policy

Grade		Percent
A	=	93% - 100%
A-	=	90% - 92%
B+	=	87% - 89%
B	=	83% - 86%
B-	=	80% - 82%
C+	=	77% - 79%
C	=	73% - 76%
C-	=	70% - 72%
D+	=	67% - 69%
D	=	63% - 66%
D-	=	60% - 62%
F	=	Below 60%

DVHS School wide Learner Outcomes

At Dougherty Valley High School, students will:
· Communicate effectively
· Become critical thinkers problem solvers who support ideas w/ reliable evidence
· Practice integrity, honestly, and ethical behavior as a global citizen
· Be a responsible partner in the learning process
· Take ownership of individual growth

DVHS EXPECTATIONS

All Students will…
1. Accept responsibility for your education, decisions, words, and actions.
2. Act in a way that best represents your school, parents, community and self to promote a safe, healthy environment in which to learn.
3. Be active in the school and community.
4. Maintain balance between academics, co-curricular activities and personal life.
5. Support your fellow students and their activities.
6. Respect cultural diversity, individuality, and the choices and rights of others.

From the AP Course Setting:

Comparability Studies

The AP Program periodically conducts college score comparability studies in all AP subjects. These studies compare the performance of AP students with that of college students in the courses for which successful AP students will receive credit. In general, the AP composite score cut-points are set so that the lowest composite score for an AP score of 5 is equivalent to the average score for college students earning scores of A. Similarly, the lowest composite scores for AP scores of 4, 3, and 2 are equivalent to the average scores for students with college scores of B, C, and D, respectively.

Students who earn AP Exam scores of 3 or above are generally considered to be qualified to receive college credit and/or placement into advanced courses due to the fact that their AP Exam scores are equivalent to a college course score of "middle C " or above. However, the awarding of credit and placement is determined by each college or university and students should check with the institution to verify its AP credit and placement policies.

Dougherty Valley High School will be following the District Homework Policy (AR 6154 and BP 6154), please see the Homework Policy on the District Website as well as the Dougherty Valley High School Web Site **– Please be advised that this policy is/can be different for Honors/AP Courses**

Advanced Placement Chemistry Summer Assignment 2020-2021

Due Friday of the 1st Week of School

(You will get access to the online text when school begins)

Hello! I am excited that you are signed up to take AP Chemistry this coming year! I have created this summer assignment to help you start AP Chem with your best foot forward, prepared for the challenging work we have to start covering immediately when school starts – we have no time to waste!

You will be expected to **know** the information covered in your first year chemistry course (please know that College Prep Chemistry does not cover the same amount and depth as Honors Chemistry). You need to enter AP Chemistry prepared for an assessment (**TEST**) worth up to 15% of your grade given on the second day of school. It is imperative that you know immediately if you have the foundational knowledge and skills to participate fully in the course before the "add drop window" closes. While I know that sounds stressful to have an assessment on the second day of school, it would be more stressful to be in a class you don't want to be in for the entire school year!

The chapters and topics you see in the next several pages are a review of what you should have learned in Chemistry last year and are foundational to the AP Chemistry program. These chapters may not cover everything you learned, there may be chapters/topics that were not covered by your specific teacher, but you are still expected to have these basics understood so you can fully participate at the start of AP Chem.

The summer program is an important part of the AP course and serves two functions: 1) to keep you active as readers, you have to read the text book or success will be more difficult, and 2) to prepare you for the level of material we will be learning throughout the academic year. If you have gaps in your knowledge of the topics below, you need to self-study them over the summer. Be an engaged, proactive, self-sufficient learner!

Summer Work

REMEMBER

- Everything from Honors Chem! AP Chem mixes all topics together, your background knowledge in the Honors Chem topics is essential because they will appear inside other chapters starting week 1 in AP!
- All my Honors Chem materials are on the class website! (www.mychemistryclass.net → Honors Chem)

KNOW

- Solubility Rules, Common Ions, VSPER
- All Reference Pages are on the class website (www.mychemistryclass.net → AP Chem → Reference Sheets)

REVIEW

- Stoichiometry, Kinetics, Equilibrium, Acid Base – **large part of AP CHEMISTRY!**

LEARN

- A little bit of Redox chemistry. We no longer have time to teach this in the Honors Chem class unfortunately. The practice work attached below will have some resources for you to learn a little bit about this chapter.
- Any topics on the next pages marked with a (*) as these may not have been taught in recent Honors Chem years due to a variety of reasons.
- Any topics on the next pages that you missed due to absences, taking Honors Chem at a different school, etc.

PRACTICE

- Summer Practice Problems – Attached below – complete and correct (ANSWER LINK at top)
- This portion will be turned into the teacher!

CHECK

- Complete Self-Assessment Quiz for Ch. 1-4 once you have access to the online textbook.
  - >> log in >> Pearson eText >> Click on "∨" for each Ch. >> scroll to Self-Assessment >> at top click on the 3 dots to print >> print and complete. Answers at bottom to check/correct work. Annotate each problem: your thought process to arrive to the answer your chose.

Topics Students are Expected to Know Before the Start of AP Chemistry

This list does not cover every single topic/fact. It is just a quick overview to help guide your self-studying during the summer. Chapter numbers and titles correlate with Mrs. Farmer's Honors Chemistry class order. All PowerPoints, worksheets, etc. can be found on the Honors tab of the class website. Please use them to help your review! www.mychemistryclass.net Items marked with a (*) may not have been taught in recent Honors Chem classes due to a variety of reasons. Please self-study them!

1st Semester Chapters						
1	**2**	**3**	**4**	**5**	**6**	**7**
Basics & Atomic Structure	**Nuclear Chemistry**	**Electrons**	**Periodic Table**	**Bonding & Structure**	**Reactions**	**Stoichiometry**
Metric system *Sig figs* *Dimensional analysis* *Types of matter* *Atomic structure*	*Writing equations* *Half life calcs.*	*E- configurations of atoms and ions* *Noble gas configuration* *Orbital diagrams*	*Table structure* *Ions* *Trends*	*Types of bonds* *Naming/Formulas* *Lewis struct./Vsper* *Polarity* *IMFs*	*Balancing eqs* *Types of rxns* *Predicting products* *Net ionic*	*Molar conversions* *Regular stoich.*
2nd Semester Chapters						
8	**9**	**10**	**11**	**12**	**13**	**14**
Adv. Chemical Ratios	**Gas Laws**	**Thermochem.**	**Solutions**	**Kinetics**	**Equilibrium.**	**Acid/Base***
Limiting reagent stoichiometry *Percent composition* *Empirical formulas* *Combustion analysis*	*Gas laws* *Finding density and molar mass* *Collecting gas over water vapor* *Gas stoichiometry*	*Specific heat* *Calorimetry* *Heating curves* *Molar heats** *Heat of rxns** *Rxn diagrams* *Mixed phase calorimetry**	*Solution concepts* *Solution calculations*	*Rate effecting factors* *Rate expressions* *Instantaneous rates* *Rate laws* *Rate constant - k* *Method of initial rates*	*Le Chatelier's* *K versus Q* *ICE Tables*	*Properties* *Types* *Naming* *pH calculations* *Strong/Weak* *ICE tables* *Salts and pH of salts* *Titrations*
						15
						Redox Chemistry*
						Assigning oxidation # *Writing half reactions* *Balancing rxns in acidic or basic solutions*

Some More Review Topics from Honors Chem

This list is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the tests, and there are potentially things not on this list that will show up on the tests. Material that appeared anywhere during the Honors Chem course all have the potential to appear on the test. Pay attention to anything that indicates it was not taught during your school year, you will need to self-study those topics as part of your summer assignment. Remember everything is on the Honors tab of the class website! www.mychemistryclass.net

LINK

Some Resources for Redox

Here are some resources for you to use to study Redox. You do not need to learn an entire chapter's worth of information on this! Be careful searching for work on the internet because the intro topic of Redox can sometimes be combined with a more complex topic called Electrochemistry which encompasses many more topics!

- Assigning Oxidation Numbers:
- Writing Half Reactions:
- Balancing Reactions in Acidic Solutions:
- Balancing Reactions in Basic Solutions:
- Packet of Practice (sorry, as of now I do not have answer keys!):

Dougherty Valley AP Chemistry **Name:**
Summer Stoichiometry – AP Level **Period:**
CLICK HERE FOR ANSWERS!

READ ME! ☺

Thank you for showing an interest in taking AP Chemistry next year! Being successful in AP Chemistry requires that you enter the class with some foundational skills that you learned in your first year chemistry course. The PRACTICE PROBLEMS BELOW are problems that you should be able to solve BEFORE starting AP Chemistry. The answers can be found by clicking the link above, and they will show you how to solve the problems so you can find your potential mistakes. We hope this set of problems can help inform your decision about whether or not taking AP Chemistry next year might be the right choice for you. *Note* The link for the answers will show some questions that we skipped due to them being outside the scope of what you should be able to do. The skipped questions will be indicated below.

STAPLE YOUR WORK TO THE BACK OF THIS PAPER!
THIS PAPER WILL BE TURNED ON FRIDAY THE FIRST WEEK OF SCHOOL!

#	Question	Got it Correct? ✓
1	A salt contains only barium and one of the halide ions. A 0.1480 g sample of the salt was dissolved in water and an excess of sulfuric acid was added to form barium sulfate, which was filtered, dried and weighed. Its mass was found to be 0.1660 g. What is the formula for the barium halide?	
2	**SKIP**	
3	**A)** A 5.000 gram sample of a dry mixture of potassium hydroxide, potassium carbonate and potassium chloride is reacted with 0.100 L of 2.00-molar HCl solution. A 249.0 mL sample of dry carbon dioxide gas, measured at 22.0 °C and 740.0 torr, is obtained from this reaction. What was the percentage of potassium carbonate in the mixture? **B)** **SKIP**	
4	**A)** For the reaction below, when 0.5000 g of XI_3 reacts completely, 0.2360 g of XCl_3 is obtained. Calculate the atomic weight of element X and identify it. **$2XI_3 + 3Cl_2 \rightarrow 2XCl_3 + 3I_2$** **B)** If 0.520 grams of XCl_3 are treated with iodine, 0.979 g of XI_3 are produced. What is the chemical symbol for this element?	
5	A 2.077 g sample of an element, which has an atomic mass between 40 and 55, reacts with oxygen to form 3.708 g of an oxide. Determine the formula mass of the oxide (and identify the element). **TRY**	
6	A 12.5843 g sample of $ZrBr_4$ was dissolved and, after several steps, all of the combined bromine was precipitated as AgBr. The silver content of AgBr was found to be 13.2160 g. Assume the atomic masses of silver and bromine to be 107.868 and 79.904. What value was obtained for the atomic mass of Zr from this experiment?	
7	**SKIP**	
8	**SKIP**	
9	**SKIP**	
10	**SKIP**	
11	**SKIP**	
12	How many phosphate ions are in a sample of hydroxyapatite [$Ca_5(PO_4)_3OH$] that contains 5.50 x10^{-3}g of O_2	
13	A mixture consisting of only sodium chloride (NaCl) and potassium chloride (KCl) weighs 1.0000 g. When the mixture is dissolved in water and an excess of silver nitrate is added, all the chloride ions associated with the original mixture are precipitated as insoluble silver chloride (AgCl). The mass of the silver chloride is found to be 2.1476 g. Calculate the mass percentages of sodium chloride and potassium chloride in the original mixture.	
14	Ammonia is produced industrially by reacting: $N_2 + 3H_2 \rightarrow 2NH_3$ Assuming 100% yield, what mass of ammonia will be produced from a 1:1 molar ratio mixture in a reactor that has a volume of 8.75 x 10^3 L under a total pressure of 2.75 x 10^7 Pa at 455 °C.	
15	Upon heating, a 4.250 g sample loses 0.314 grams. Assuming the sample is $BaCl_2 \cdot 2H_2O$ and NaCl, calculate the mass percent of $BaCl_2 \cdot 2H_2O$.	
16	**SKIP**	
17	Ammonium nitrate and potassium chlorate both produce oxygen gas when decomposed by heating. Without doing detailed calculations, determine which of the two yields the greater (a) number of moles of O_2 per mole of solid and (b) number of grams of O_2 per gram of solid. The unbalanced equations are:	

	$NH_4NO_3(s) \rightarrow N_2(g) + O_2(g) + H_2O$ $KClO_3(s) \rightarrow KCl(s) + O_2(g)$	
18	An element X forms both a dichloride (XCl_2) and a tetrachloride (XCl_4), Treatment of 10.00 g XCl_2 with excess chlorine forms 12.55 g XCl_4. Calculate the atomic mass of X, and identify X.	
19	Water is added to 4.267 g of UF_6. The only products of the reaction are 3.730g of a solid containing only uranium, oxygen, and fluorine and 0.970 g of a gas. The gas is 95.0% fluorine, the remainder is hydrogen. **A)** What fraction of the fluorine of the original is in the solid & what fraction in the gas after the rxn? **B)** What is the formula of the solid product?	
20	A compound containing titanium and chlorine is analyzed by converting all the titanium into 1.20 g of titanium dioxide and all the chlorine into 6.45 g of AgCl. What is the simplest (empirical) formula for the original compound?	
21	An unknown element X is found in two compounds, XCl_2 and XBr_2. In the following reaction: $XBr_2 + Cl_2 \rightarrow XCl_2 + Br_2$ when 1.5000 g XBr_2 is used, 0.8897 g XCl_2 is formed. Identify the element X.	
22	**SKIP**	
23	A sheet of iron with a surface area of 525 cm^2 is covered with a coating of rust that has an average thickness of 0.0021 cm. What minimum volume of an HCl solution, in mL, having a density of 1.07 g/mL and consisting of 14% HCl by mass is required to clean the surface of the metal by reacting with the rust? Assume that the rust is $Fe_2O_3(s)$, that it has a density of 5.2 g/cm^3, and that the reaction is: $Fe_2O_3(s) + 6HCl(aq) \rightarrow 2FeCl_3(aq) + 3H_2O(\ell)$	
24	A 1.42 g sample of a pure compound, with formula M_2SO_4, was dissolved in water and treated with an excess of aqueous calcium chloride, resulting in the precipitation of all the sulfate ions as calcium sulfate. The precipitate was collected, dried, and found to weigh 1.36 g. Determine the atomic mass of M. What element is it?	
25	Calculate the volume change when iron is oxidized to Fe_2O_3 (d = 5.24 g/cm^3). Density of Fe=7.787 g/cm^3.	
26	A 0.204 gram sample of a metal, M, reacts completely with sulfuric acid according to: $M + H_2SO_4 \rightarrow MSO_4 + H_2$ A volume of 213 mL of hydrogen is collected over water; the water level in the collecting vessel is the same as the outside level. Atmospheric pressure is 756.0 torr and the temperature is 25.0 °C (H_2O vapor pressure = 23.756 torr). Calculate the molar mass of the metal.	
27	A common way to obtain a pure metal from its impure metal oxide is to react the oxide with carbon, expressed generically as: $2MO(s) + C(s) \rightarrow 2M(s) + CO_2(g)$ If 5.00 g of an unknown metal oxide (MO) reacted with excess carbon and formed 738 mL of CO_2 at 200.0 °C and 0.978 atm, what is the identity of the metal?	
28	A compound of P and F was analyzed as follows: heating 0.2324 g of the compound in a 378 cm^3 flask turned all of it to gas, which had a pressure of 97.3 mmHg at 77 °C. Then, the gas was mixed with calcium chloride solution which turned all of the F to 0.2631 g of CaF_2. Determine the molecular formula of the compound.	
29	A metal chloride reacts with silver nitrate solution to give a precipitate of silver chloride: $MCl_2 + 2AgNO_3 \rightarrow M(NO_3)_2 + 2AgCl$ When a solution containing 0.4750 g of metal chloride is made to react with silver nitrate, 1.435 grams of silver chloride are formed. Identify the metal.	
30	An unidentified metal M reacts with an unidentified halogen X to form a compound MX_2. When heated the compound decomposes by the reaction: $2MX_2 (s) \rightarrow 2MX (s) + X_2 (g)$ When 1.12 g of MX_2 is heated, 0.720 g of MX is obtained along with 56.0 mL of X_2 gas (at STP). **A)** What is the atomic mass and the identity of the halogen X? **B)** What is the atomic mass and identity of the metal M?	
31	A metal sulfate has the formula M_2SO_4. 10.99 g of the compound was dissolved in water to make 500.0 cm^3 of solution. A 25.0 cm^3 sample was removed and reacted with an excess of $BaCl_2(aq)$ to produce a precipitate of $BaSO_4$, which when dried had a mass of 1.167 g. **A)** Determine the number of moles of $BaSO_4$ precipitated. **B)** Determine the concentration of M_2SO_4 **C)** Identify M	
32	An element, X, forms two compounds with bromine: XBr_2 and XBr_4. When 10.00 grams of the XBr_2 is reacted with excess bromine, 14.35 g of XBr_4 is formed. Identify X.	
33	Exactly 4.32 g of oxygen gas was required to completely combust a 2.16 g sample of a mixture of methanol and ethanol: **A)** How many moles of ethanol are contained within the sample? **B)** What is the percentage by weight of methanol in the sample?	

34	A 3.41 g sample of a metallic element, M, reacts completely with 0.0158 mol of a gas, X_2, to form 4.53 g MX. What are the identities of M and X?	