

Chemistry A & B

Vision and Grading Policies

Course Description

Chemistry is the study of the composition of substances and the changes they undergo. At its core, it is the study of the elements which God created and used to build the universe, the earth, and all the substances known to man. Chemistry scratches the surface of the detail and complexity that God used in His divine design of the universe. As such, it provides significant opportunity to expand the student's view of God and inspire an awe of the God we serve. As with all of the science courses at MCA, Chemistry will offer innumerable opportunities to better understand Romans 1:20: "For since the creation of the world His invisible attributes, His eternal power and divine nature have been clearly seen, being understood through what has been made."

Primary Objective

The goal of the course is to introduce students to various aspects of chemistry from the high school to the early college level. The main objective is that they would gain a mastery level of understanding of chemistry, chemical reactions and chemical balances in nature. Optional problems and special projects will be offered to those students who want to achieve beyond the mastery level. Class topics will attempt to reinforce the practical and mathematical aspects of chemistry and bring into focus how chemistry influences everyday life.

Secondary Objective

Chemistry is a challenging subject that will create differing levels of adversity for the students throughout the year. Aside from the main objective of understanding the subject, a secondary objective of the class will be to help the students face and overcome these adversities in order to grow in personal confidence and character. This class, as well as all classes at MCA, provides an opportunity for tutors to disciple young men and women to follow Christ in every area of life. Because of this, some activities, class discussions and personal tutoring will focus on developing character as well as understanding chemistry. In the end, the students may find that achieving the secondary objective is more valuable than achieving the first.

How Chemistry Fits Into MCA's Math/Science Curriculum

Chemistry at MCA is intended to be taken in a student's junior year. This is because a certain level of maturity is required by the students to prepare for class and pass tests in a format very similar to college science courses. Most students taking Chemistry have learned this maturity in Physics/Trig in their sophomore year. Physics/Trig should have taught students the value of self-discipline in keeping up with assigned problems, the value of study skills to truly understand problems for themselves, and the value of humility to seek prompt help if needed. Most students consider Physics/Trig their most difficult class at MCA, not on a content basis (most students find the

content of Chemistry more difficult!), but mostly because learning these lessons (self-discipline, study skills and humility) is not easy.

With that said, there are a handful of sophomores each year who are allowed to take Chemistry concurrently with Advanced Algebra in order to remain on-track for graduation. These students will then take Physics/Trig their junior year. For these students, the degree of difficulty in math is not usually an issue, since the math involved in Chemistry is not very complex. What is an issue is that the level of maturity for the course is one year beyond what is normally expected for sophomores at MCA.

Grading

Whether taking the class as a junior or as a sophomore, Chemistry should be faced as a very serious subject that many in the past at MCA have failed to master. Chemistry requires the student to think in an organized, systematic manner and to take personal responsibility to complete homework on time and be prepared for class. The grading system described below rewards those students who can do this and challenges those students who find it difficult.

As in all classes at MCA, *Mastery (M)* will require a total *in excess* of 85% of the total points awarded in the class. *Mastery With Honors (MH)* (MQ for fall semester) will be achieved by the student achieving above 92.5% of these total points and by completing a service-oriented class project sometime in the course of the year. Students may initiate their own project idea or build upon suggestions offered by the tutors or classroom assistants.

A student's grade in the class is based on the following breakdown:

Participation Grade: 30 %

General Preparedness, Attitude and Participation in Discussions	50% (of the 30%)
In Class Quizzes over Subject Matter (Unannounced)	50%

Project Grade 70%

Homework:	Approximately 15% (of the 70% Project Grade)
Notebook Check:	Approximately 10% (Class notes, research, organization)
Tests:	Approximately 60%
Quizzes (Announced):	Approximately 15%

Class Participation: 30% of a student's grade is based on class participation. Approximately half of a student's participation grade is earned (or lost) based on attendance, class preparation, classroom attitude, classroom discussion participation and overall contribution to a learning environment. Class preparation involves pre-class reading as well as finishing their assigned homework so as to be prepared for classroom discussion. Students will sometimes be randomly selected to lead the class in a discussion of a homework problem. Class participation will be awarded or deducted based on their understanding of the problem and ability to explain it to the class. The other half of a student's participation grade is based on random, unannounced quizzes designed to determine if a student is prepared for class by doing the homework or required reading.

Homework, Notebook Checks, Quizzes and Tests: A detailed syllabus is provided to each student. It outlines a schedule for completing homework assignments and lists the names of famous chemists which the student is required to research. Homework is collected on a daily basis at the beginning of class and accounts for 15% of the project grade. It will be graded for completeness and *may not be revised*. It may be turned in late for 80% of the credit up until one week from the date it was due. After this it receives no credit. Approximately 10% of a student's project grade will be based on keeping an organized notebook that contains the student's homework, tests, labs, research and notes from class. The notebook is expected to be organized and neat and must be produced on test days. It may be revised for up to 50% of the original points up to one month from the test date if it is deemed incomplete. Quizzes that are announced on the syllabus will be worth approximately 15% of the project grade. Scheduled tests will be worth 60% of the project grade. A grade of 70% is required to "pass" the test and do revisions. If a test score is less than 70% the test must be a) revised for 70% of the points missed, b) reviewed with the tutor to identify problem areas, and c) retaken with a different version. No revision points are allowed on the retake. If a test below 70% is not retaken, the revision points are not allowed. This process is designed to ensure student understanding and to force the student to take very seriously their first attempt at the test.

These tests are shown on the syllabus and represent the primary way the tutor will gauge the student's understanding. As such, tests should be prepared for thoroughly by completing and understanding each homework assignment and reviewing these assignments before the test.

Quiz and Test Revisions: All announced quizzes (regardless of original score) and tests passed with an original score above 70% may be revised within one month from the date taken for 70% of the points lost. A student is never required to revise anything! If a test is not passed (the original score is below 70%), the following process must be followed to receive 70% of the points lost on the original test:

1. The student must revise the test and arrange for a time to sit down one-on-one with the tutor to go over these revisions to ensure understanding. The second test will be given only after this process has occurred. The student must initiate this one-on-one tutoring session at the tutor's convenience.
2. At the tutor's discretion, if sufficient understanding cannot be demonstrated, the student may be required to revise certain homework problems that are creating difficulty. The student must then review these problems as well as the test revisions with the tutor in a one-on-one session at the tutor's convenience.
3. The student must pass a second version of the test with a score of greater than 70% or the process repeats.
4. On the last retaken test, no revision points will be allowed. The student will receive the points on the original test, 70% of the points lost on the original test and the points scored on the retake set against two test grades.

If the student never retakes the test, their initial score will stand. From this process, it should be obvious to the student that it is **MUCH** easier to understand a problem the first time it is turned in for homework, study all their homework problems prior to taking the first test, and ***pass the test the first time*** with a score above 70% so that they can freely revise for an even higher score. If this is not done, the student usually falls so far behind the general class that it becomes difficult to pass the course with a grade of 85%.

Extra Credit Assignments and Special Projects: Additional points may be earned through the completion of extra credit assignment or special projects. These will require a special request to the tutor and may differ according to student. Assignments may involve additional homework, research or an in-class presentation. Special projects will allow the students to explore an area of interest more deeply with the purpose of sharing or demonstrating insights to the rest of the class.

Class Time

Class time will be spent discussing concepts dealt with in the textbooks that students have read before class. Class time will also focus on working practical problems to reinforce the concepts addressed in the text. Students will be chosen randomly to go to the board and explain various “class participation problems”. Hands-on labs will also provide practical demonstrations. Chemistry is a “problem intense” subject, that is, there are many practical applications of the concepts that are best understood by working through example problems. Thus, Chemistry places a premium on discipline to methodically work problems and understand concepts. Tutors and teaching assistants will make themselves available for individual and small group help on homework problems. Students are encouraged to work together to understand homework problems, but all students are expected to do their own work.

List of Books

Basic Chemistry (Sixth Edition) by G. William Daub and William S. Seese is the text for Chemistry. As the title indicates, it lays out the basic concepts of chemistry in an organized and relatively simple manner. Classroom questions and problems as well as homework problems are found at the back of each chapter.

Tutor and Tutor Hours

The tutor for this class will be Aaron Russell.

He can be reached at the following numbers and E-mail addresses:

Aaron Russell 2207 Huntington St
 Cell: 432-312-2493
 Work: 432-694-0994
 Email: arussell@mcaknights.org

Parents and students are invited to communicate with the tutor frequently via phone, E-mail, office visit or lunch.

The student is required to place a book cover on the textbook for the first day of class. Class participation points will be deducted for each day the textbook remains uncovered.

MCA Chemistry

Assignments for the First Day of Class:

Read the Introduction to Chemistry in the packet we mailed to you.

Do Assignment #1 (below) to be turned in on the 1st day of class.

Assn #1 (Two Parts!): Do Unit Conversion Worksheet Problems 1-20 (show all work for credit – this is due the first day of class!) AND the 8 problems on the Equation Manipulation Worksheet. (Also due the 1st day of class!) If you need help, Mr. Snell or Mr. Russell or come by early on Monday morning before class. These sheets are review and should be easy. You may remember doing them in 7th grade Pathways and Transition Math. If you do not understand this solution method for unit conversions, let your tutor know as soon as possible and GET HELP! Mr. Snell's cell phone is 978-7042 and he does not mind summer phone calls!

Read MCA Issued Textbook, Chemistry Chapters 1-2

Memorize the first 30 Elements of the Periodic Table

(name, spelling, symbol – you do not have to memorize the atomic number)
(note on the syllabus where there will be a quiz on the first day of class!!)

Buy a 3-Ring Notebook (should have been mentioned on the Supply List for the class). You may begin filling it with research that you will do on the first few famous chemists and eventually global warming topics. For the chemists, get your data from Wikipedia. Simply print the article on each chemist and put it in your notebook in an ordered manner. (You will have to read these articles eventually as there will be questions on each test regarding them). If you don't want to print the articles, you may take notes on them and place these notes in your notebook. Your notes should include who they were, when they lived, their nationality, their significant scientific contribution(s) and something interesting about their personal life. For global warming topics, your data may come from a variety of sources and may include differing points of view. Again, you may print your research from the internet and place it in your notebook or take significant notes. We will discuss these in class and you will eventually write a global warming paper from your research. By the end of the year you should have a pretty large notebook. Your notebook will be checked on test dates noted on the syllabus.

For the high achievers: Success in the class often comes down to how well a student memorizes or learns the names, symbols and charges for the major cations, anions and polyatomic ions from the tables on pages 109, 110 and 125. You will need to know these by the time you return from the 9th-12th grade Fall Retreat. The sooner you begin memorizing them the better off you will be. Beginning a system to memorize these before the Fall Retreat would be an excellent idea!

Introduction to MCA Chemistry

Welcome to Chemistry at MCA! Mr. Snell or Mr. Russell will be your tutors on the incredible journey through the world of Chemistry.

Chemistry is a junior level class at a Socratic high school. What this means is that you will be required and expected to read the textbook, do your homework and come to class prepared. **Maturity** is required to do this diligently, every day, and to seek out help with difficulties before the next class period. Your tutor will be your coach. They can coach you how to work problems and tackle difficulties only as you are working through the textbook on your own. As juniors, you will be treated as young adults. If you are a sophomore and are in this class because you are off-track in math, this class management style may require your quick adjustment from a lecture-based style that you may be used to. You will find this method of study has great freedoms and great responsibilities.

Maturity and time management produce great grades in Chemistry. Your grade is largely based on participation (whether you are prepared for class) and test grades. Chemistry starts out slowly and gets difficult. You may be bored at times. It is an easy class if you remain diligent. It gets extremely hard if you do not work at it on the pace suggested by the syllabus.

You should do your homework every night. The answers are in the back of the book and the book is full of example problems. Don't wait until class time to expect help understanding the problems. Your tutors will post their office hours and make themselves available as much as possible. Starting your homework right after class or the day before it is due is extremely valuable and far preferable to starting it the night before or the morning before it is due. Your homework accounts for 10% of your grade. The rest is based on announced quizzes and tests. Understanding your homework ensures success. Not doing it or not understanding it will quickly lead to being overwhelmed.

Chemistry has much less opportunity for extra credit than Physics/Trig. There are no magic pills for raising your grade 2-3%! A lot of extra credit ideas are really MH ideas. Do not rely on extra credit for help passing chemistry.

Almost every test has a multiple choice section regarding terms (definitions) from your book. Almost every test has a multiple choice section over famous scientists. These are easy sections on which to accumulate points toward passing your tests. They are also the source of many past failures! Read your book! Understand the definitions of terms! Do your research on scientists. These are nearly "free" points!

You will be asked to keep a notebook of homework, research on scientists, and on various global warming topics. Your notebook will be due on the test dates noted on the syllabus. A neat, organized, notebook with all the information up to that point easily found will be worth many points in the project and participation categories. Don't lose these points through

incompleteness or simply forgetting your notebook. These again are easy points! You will need all these participation points to offset poor pop quiz grades!

Eventually you will have to write a paper on global warming from the research you have done. Your paper will be a somewhat technical discussion on this controversial issue. It will include analysis of graphs, charts and diagrams. I will provide a lot of research to you over the course of the year. Keep a neat notebook and this project becomes MUCH easier. READ and pay attention to what is discussed in class and your paper nearly writes itself!

One more thing - most people who finish with 84% and must retake the class (it has happened more than once!) rue the day they did not do revisions on quizzes and tests. Pay attention to the one month deadline! If you make less than 70% on a test, you must 1) revise, 2) review your revisions with your tutor and 3) retake the test within one month. You must allow enough time to review your revisions with your tutor so you do not miss the one month deadline. This is your responsibility, (remember -- maturity!). This process should encourage you strongly to ***study and pass the test the first time!*** You may then simply revise and maintain a high grade in the class.