

## On Learning Chemistry: Philosophy

### **On the role of the teacher:**

A teacher can share knowledge in the form of facts and skills in as many different styles and contexts such that at least one approach will be understandable to every student making the true effort to understand. A teacher can show you how to use resources to find the information you need. A teacher can offer suggestions for methods to help with understanding and share techniques for solving problems so you may learn to choose a method for each situation. A teacher can ask questions to help you think through what you know. A teacher is here to listen. A teacher can answer questions or help you find answers – and most importantly, teach you to find answers on your own as an independent learner.

A teacher's role is in no way to provide facts for you to “memorize” and recite on cue for the purpose of a letter grade written on your transcript.

### **On the role of the student:**

The role of the student is to know or to discover how he best learns and to apply his learning style to the work assigned. The student is expected to make use of the suggestions and exercises presented and show evidence of doing so. The student is expected to ask questions during class time and outside of class as well. The student is expected to make an honest attempt at understanding the materials presented and ask questions with focus as opposed to “I don't understand.” What is it that is not clear? The student must commit to the work and thus may expect success.

Inasmuch as the world is not a memorize-and replay world, this course is not an attend-memorize-and-replay course. You have brought some knowledge and skills with you, and you must be willing to use them alongside the new things you learn. You will need to attend class each day with your materials, a positive attitude toward learning, and the willingness to make the best effort you can information, lab handouts, completed reports each day. In return, you will be provided with the tools and encouragement you need to learn chemistry as you reason and analyze your way to sharper thinking skills. If you were to train for scuba diving, you'd be told that training is purchased, but certification is earned. In chemistry, you will be given the analogy that all information and skills will be presented in several different learning modalities, but that you as the learned are ultimately responsible for assimilating and integrating them, and expected to communicate your progress along the way. The teacher cannot provide help if you do not communicate your need.

The tools you will receive are varied in nature, from facts and skills to the opportunity to use them as you research the role of chemistry in the world around you. Sometimes the facts must be remembered because you will use them so often that looking each one up whenever it was needed would be too cumbersome. Sometimes facts will be recorded, to be retrieved at some later date. Skills, including a few mathematical techniques, will be demonstrated for you to practice under guidance a first, then on your own with feedback, then to show how much you learned on a quiz. You will use these facts and skills to find what you need in a laboratory setting. Finally, you will be tested much as you would be in a university setting.

### **On Thinking:**

Although you will find that you absolutely must know some facts, by its nature this course does not lend itself well to the memorization and regurgitation of facts. It is hoped that the thinking and problem-solving skills you learn in this course will be useful to you in your future education and in your career as well. The only successful way out is through.

### **On Work:**

Your work for the quarter will involve many related assignments. You are expected to work through these assignments at a reasonable pace so as to complete each comfortably. Due dates are firm and you should plan to turn your work in BEFORE the due date listed for each. For example, at the beginning of each quarter you will be given approximately 30 assignments, many due near the end of the quarter. It is expected that most assignments will challenge you and that you will have some questions. Help is available to you before and after school, you during class, during free periods, and whenever you can reach me via phone or e-mail. Your questions are expected, welcomed, and encouraged. If you believe that asking questions is a sign of weakness, you will probably do poorly in this course until you change that belief. Time lines will be provided to help you to keep pace with your work. Expect to have considerable chemistry homework every night. This course has been designed to permit you some flexibility in the organization of your time. MHS students have many diverse interests and obligations, and at times will get considerably ahead or fall a little behind the expected pace of the class. It is a mistake to use this freedom without accepting the accompanying responsibilities. Most students seem to flourish when given more responsibility. Some students, however, do not handle responsibility well, and the suggested preventative measures of keeping current are not applied. The nature of the course will permit you to dig yourself into an uncomfortably deep hole, out of which, your instructor will certainly try to extricate you if you should allow yourself to fall in. The worst thing you can do is to pretend to your instructor and parents that you are doing well when you are not. The most successful students are not the ones who have no challenges; they are the ones who openly and quickly seek help to resolve their challenges. The poorest students are those who recognize a problem, ignore it, and try to move forward on a shaky foundation hoping it will all pass. It won't. Although you have been assigned to a particular chemistry class and are responsible for attending that class, all of the other chemistry classes periods 2,3,5b,6,7 are open to you as long as you are not scheduled into another class during that time. You do not need to ask if you can attend another class, as if you were a visitor, although obtaining a pass from study hall prior to the class you want to attend is required. All of the classes are yours, although you must attend your scheduled classes.

### **On Assignments:**

Each unit of study will be assessed in several different ways, using homework, self-checked problem-solving, teacher-scored problem solving, quizzes, labs, and unit tests according to the 100% factor and the 150% factor. You will find it in your best interest to DO the assigned work as your own work at the assigned times. This always results in reasonable test scores, which are further boosted by your efforts in staying current and working hard.

### **On Assessments:**

Assignments are structured and monitored with the intent of giving the student every possible means to achieve a good mark and to achieve it as a result of doing the work necessary to master the skills and content. Some students will find it necessary to do more work than others due to differing ability levels and learning styles, but every student is provided with the means to

achieve the desired high grades. It is when a student focuses on only the high grade or course credit needed rather than on learning that this goal becomes unattainable. Do the work, learn the material, and the high grade will take care of itself.

### **On Methodology:**

Most students learn science by experimenting, analyzing, studying, and by interacting individually with classmates and teachers, followed by individual thinking before returning to class. Lectures are usually an ineffective way to learn, thus are not the primary method used in a course of this nature; but rather are resorted to for short explanations and demonstrations. In a thought-provoking course, lectures are an inferior means of teaching, because as soon as a student is provoked into thinking, the student runs the risk of missing the rest of the lecture. Class discussions are opportunities for students to exchange ideas in an atmosphere of analytical thinking and exploration of ideas. During class discussions, the flow of ideas from students often determines the direction of discussions. This course is designed for student discussion and working together to be an important source of learning.

This technique however sometimes supplies answers without understanding. Do you find yourself saying, "I don't do well on tests."? You may have the illusion of understanding. Poor grades on the tests indicate that you do not understand. Discussion with other students is important, but realize you will want some one-on-one time with your teacher and seek this. It is necessary for you to spend some time outside of class, so schedule your before and after school activities accordingly with your coaches and advisors. Lab partners have a responsibility to each other, especially if the lab group is composed of students who have greatly differing abilities or interests. A lab partner who shoulders most of the responsibility for analyzing and writing up the report is not doing the other lab partner(s) a favor. Because of the 150% factor, the partner who does not understand or who has not actually performed the analysis is likely to discover that a low grade on the corresponding test will produce a low grade on the laboratory. Since many tests may be retaken, some students will rely on successful retakes rather than preparing properly for the first test. This is a poor idea, since these students will intentionally fall well behind the flow of ideas in the course. It is not efficient to take tests on subjects long after the experiments upon which they are based are over. Such students experience considerable frustration and eventually do poorly or learn to make limited use of make-up tests.

### **On Cheating:**

Chemistry is a demanding course. You are already handicapped if you ascribe to the attitudes of other students and parents who perpetuate the belief that "Chemistry was hard for me so it will be for you too." Some students have a tendency to fall behind and then attribute their failure to an "impossible" course. Add the emphasis of high grades whether or not learning has taken place that permeates this community, some students may be driven to cheat in order to achieve an expected grade. This is, of course, entirely unacceptable behavior. It's far easier to do whatever is necessary learn the material than it is to find old lab books (labs are sufficiently changed in small ways to alert the instructor to this behavior) and to memorize past tests without understanding the concepts. Please let your instructor know of any academic or other problems that might cause you to believe that you must cheat. I am on your side, do not wish to punish you, and will certainly work with you in an attempt to deal with your challenges so that you do not have to face the humiliation of cheating.