

## Study Strategies in Dr. Laude's General Chemistry

Before we start, time out for:

### Thoughts on being an Active Learner rather than Passive Learner.

Note that the procedures developed in this handout are among a million ways you might do things. However they all fall in the category of ACTIVE LEARNING. Whatever you do, be an ACTIVE LEARNER

**Example of a passive learner:** Reads the chapters from beginning to end. Works the homework problems with answer keys or similar problems readily available. Blah, blah, blah. Just like always in every class. But most importantly, **has no evidence that anything is actually learned**—instead, assumes that by reading the chapter and doing the homework and coming to class, that everything is learned.

**Active Learners.** Constantly assesses what is understood and what is not understood. Comes to class aware of what will be covered and knowing what is not known. Comes to office hours with specific questions about a lack of conceptual understanding. Targets the specific content material to be learned. Has a way of proving that the material is actually known. Assesses test-taking and content problem areas from previous exams and quizzes. Creates realistic test taking simulations.

## How to get an A in CH301 and CH302

### First Know Yourself

### Second, Know Your Exam

### Once this is done, Know Your Subject

### Part I: Knowing yourself as a test taker.

Ask the following questions about each test or quiz:

- Did I feel I knew the material going into the test?
- Was I happy with my studying habits?
- Did I use time wisely on the test?
- How did I feel about my performance while I was taking the test?
- How did I feel right after the exam or quiz?
- How did I feel after I received my grade?

**Based on the answers to these self-analysis questions, diagnose the following symptoms.**

- **Symptom:** Comes to test poorly prepared and does badly:
- **Diagnosis:** Immature study habits or misplaced priorities
  
- **Symptom:** Come to test confident, but soon realize that you cannot work many of the problems:
- **Diagnosis:** Poor calibration of what needs to be done to succeed on a college-level exam
  
- **Symptom:** Comes to class prepared but quickly develops stress and time-management issues.
- **Diagnosis:** This student tends to blame test-taking anxiety, but often offers this as an excuse for not really being confident about the material.
  
- **Symptom:** Moves confidently through exam and leaves certain of a good grade only to be disappointed by results. Looks back at material and blames it on “stupid mistakes”.

There are two kind of students who have this experience.

- **Diagnosis 1:** One type is overconfident about their knowledge base. They are good students who know 90% of what is needed, but on a multiple-choice test that is only enough knowledge to select an incorrect, but pretty close answer. These students have miscalibrated the amount of learning necessary to be successful. This student is so bound by rules, that if questions are even slightly different from previous material, then they miss them. This is the student who most often blames the instructor for bad questions rather than looking in the mirror.
- **Diagnosis 2:** The second overconfident student really does know the material, but has no interest in playing the game to do well on an exam. This student shows up with the wrong number pencil, a calculator with a dead battery, and no scratch paper. This kind of student believes that finishing first is more important than getting the problem right. You know who you are: it bothers you when you see other people leaving, not because you are nervous about finishing, but because you don't want to believe other students know the material better and faster. This kind of student misses negative signs and units, doesn't see the word NOT, thinks small to large instead of large to small. This kind of student would never dream of actually checking work--you may you will, but deep inside, something is screaming: “you don't need to do this, you don't make mistakes.”

(By the way, I know this last kind of student well because it is me. Oh, and don't flatter yourself that you are in this category. Being in this category is to suffer the sin of arrogance. Also, to be in this category requires that you really do know the material, and the vast majority of students do not.)

## **Developing tangible solutions based upon who you are:**

### **First:**

- Obtain old exams and quizzes.
- Next to every missed question on an exam or quiz, ask the question, why did I miss this problem. What was I thinking at the time? Was I overconfident, was I guessing. Was I freaking out? If I missed it because I didn't know the content, why is that? Did I believe I knew the material when I did not? Did I not study material in that section as well as in other.
- Look for patterns in your mistakes. When you see the reason, ask yourself, what can I do to not make that mistake again. Maybe you missed the material that was taught at the end. Maybe you missed the material that was taught at the beginning. Maybe you missed the material that you learned while riding in a car to Dallas.

### **Second:**

Based upon what you glean from an honest assessment of your exams, make lists of ways you make mistakes in exam preparation and ways you make mistakes in test taking.

#### **Sample list for exam preparation:**

- I learn best when I go to the Thursday help session.
- I learn best when I study in the library.
- I learn best when I work the problems in Davis first.
- I learn best when I read the notes just before class.

Now make your own list for exam preparation.

#### **Sample list for test taking (to be considered before every question you answer):**

- I will always make sure I look for the correct units, especially kilograms to grams
- I will make sure I see if the answer is ascending or descending order.
- I will make sure I hit the exponent button on the calculator.
- I will make sure that I enter the numbers on a calculator twice.
- I will make sure I rule out clearly incorrect answers before working calculations.

Now make your own list for exam preparation.



## **Part II. Know your exam.**

You take multiple choice exams based upon specific problem types identified in class. So develop a strategy that works for this kind of test. Here is an approach in two parts.

**First:** Learn the material from the perspective of content areas that will be on the exam rather than by learning all the material in a serial fashion.

Question: A man stands outside the library and says, you can answer the question I ask in one of two ways.

First,

you can go in the library and read every book and then come out and I will ask you the question,

or

I can tell you the question and then you can go learn the answer.

Sadly, most of you learn the first way, though you don't realize it. You act as if you need to learn everything, cover to cover, and from the first problem to the last, rather than knowing what you need to know.

**Solution:** One solution is to create individual cards on which you place all the information about a specific question. Whether you learn this material in a lecture, from a friend, from a HW, from the Internet, write it down on the card. That way you are localizing all the material for what you know will be a test question. Then when the test comes, all you see in front of you is the card with the information on it, rather than a blur of dozens of hours of lectures and studying for the entire exam.

This is no different than what you do naturally for the things you know well. I know sports. But I don't know it because I memorize every fact from Sportscenter or the paper in order. Instead, when I read something new, I immediately put it onto the appropriate index card (in my case the index cards are in my brain. Cards like Oakland Raiders, or, my love/hate relationship with Steve Sparer

So every time you see a new set of content areas (like in every musings, create a new card. That way, you study for an exam with a handful of cards in your hand, not a zillion pages of notes and answer keys.

**A picture of how information you process finds its way on to cards:**

**An example of a card on electronegativity:**

**Second:** Prepare for the way an exam is given. These multiple-choice exams are random collections of problems. You may know what is coming, but you don't know the order. And, you don't know for sure that when you read a problem you know exactly what type it is (you don't know the type of index card to pull into your brain.)

To develop this ability, practice it.

- Get a Wal Mart bag.
- Make a photocopy of your exams and quizzes.
- Cut the photocopied exam into individual questions.
- Jumble the questions up in the Wal Mart bag.
- Remove them randomly and try to guess the problem type (the index card.)
- Do this over and over, until you are able to instantly identify the type of problem
- On the exam you will find that, magically, a little voice in your head will start whispering the problem to you every time you start to work a problem.