

WHAT TO DO *AFTER* TAKING AN EXAMINATION

Chemistry BC2001x

1. *Check your estimated letter grade and see your approximate standing in the class.* The grades are posted on the web. There are two anonymous lists: the first, ordered by student identification numbers, lets you find your numerical grade; the second, ordered by numerical grade, gives *approximate* estimated letter grades corresponding to batches of roughly equivalent numerical grades. Check your position in the class distribution of grades, a histogram of which is also posted.
2. *How to interpret numerical grades on introductory chemistry examinations at Barnard:* The chemistry department aims to set these examinations so the average student gets about two-thirds right, a grade of 65 to 70 %. A little easier test has an average grade of 75 to 80 %, a too easy test an average grade >80 %; a little harder test has an average grade of ~ 60 %, a too hard test an average grade of about 50 to 55 %. The estimated letter grades represent a balance between the grade distribution (“the curve”) on this one examination and an approximate numerical standard that is adjusted for differences between examinations.
3. *Remember that the final grade in the course is based on the weighted NUMERICAL total of all the credit received for all work done in the course:* eleven graded hand-in problem sets (11%), three in-term examinations (12% each, total 36%), the final examination (23%), and the laboratory work (30%). The grade for any one piece of work does not count that heavily, and a low grade on one examination may be compensated for by good performance elsewhere. Moreover, marked improvement may lead to the discounting of early difficulties.
4. *Review your work on the examination immediately – do not put the test away until you do.* Answers are on the web. Go over each problem in detail now, comparing your work with the answers provided. Even if you did very well on this test, you must retain all this material for the final examination, and reviewing will help solidify it. If you did poorly on one or more questions, make sure you understand exactly why, and clarify or correct in whatever way is necessary in your own case.
5. *Try to separate conceptual difficulties from errors in mechanical operations* as you review and try to improve and expand your grasp of this material.
 - a) Conceptual difficulties commonly encountered might include, for example:
 - i) not realizing that all chemical reaction equations must be complete and must be correctly balanced to be of any use at all;
 - ii) not understanding that a chemical reaction equation gives stoichiometric ratios only, and that the coefficients in the balanced equation are totally distinct from the actual numbers of moles of any of the substances initially present, or formed by reaction;
 - iii) not being able to keep track of substances initially present, substances formed as reaction products, substances wholly or partly used up in reactions, and excess unreacted substances still remaining even after reaction is complete;
 - iv) not distinguishing between “oxygen” meaning atoms of O and/or molecules of O₂ gas;
 - v) not knowing how to count valence electrons, or account for ionic charges; and so on.
 - vi) not knowing how to assign and use formal charge in Lewis structures
 - b) Conceptual problems must be overcome by a better grasp of the material. For example,
 - i) being able to visualize physical situations, both initially and as all the changes proceed. Practice describing situations in your own words, or drawing pictures of processes.
 - ii) understanding all the meanings and all the implications of the chemical formulas of different kinds of substances and of balanced chemical reaction equations;
 - iii) being able to apply the law of conservation of elements to various chemical situations

- c) Reviewing specific problems and their solutions, or discussions with me during my regular office hours, can help clear up many of these conceptual difficulties quickly and efficiently. *Please come to my morning office hours or to the Monday evening problem-solving workshop as soon as possible to get help. Come whenever and as often as you need it.*
- d) Mechanical operations that you must be able to perform correctly and quickly include:
- simple algebra, such as going correctly from mass to moles and back;
 - counting the atoms of any element in a chemical compound (in integers or in moles) from the formula of the compound, without regard to where those atoms came from;
 - balancing chemical reaction equations;
 - applying the stoichiometric coefficients in a balanced chemical reaction equation correctly, and not getting the molar ratios upside down;
 - learning all important definitions and vocabulary exactly and completely, so, for example, the distinctions among O atoms, O₂ gas molecules, and oxide ions in a compound are clear;
 - always writing out all units, so you can convert grams to moles or moles to grams correctly, for any substances with specified formulas, without getting answers having units g²/mole, moles/g, or other incorrect results;
 - not rounding off too soon or too much, but rather always keeping enough extra figures so that inaccurate or misleading final answers are avoided;
 - always showing your reasoning and your calculations explicitly on any graded paper;
 - always labeling your final answers so it is perfectly clear what number you are giving, or whether your answer applies to, say, oxide ions, or O atoms or O₂ molecules; and so on.
- e) Mechanical operations can always be done correctly by following specific rules faithfully, and those rules are learned and eventually followed automatically only after repeated practice and drill. You must do these operations again and again until you learn how to do them right, every time. There is no reason not to perform those kinds of operations perfectly.
- 6. Review your specific strategies and actual practice in taking the examination:**
- Did you make sure to get enough sleep the night before the examination?
 - Did you work first on the problems you thought you understood best?
 - Did you keep track of the time and allocate your time appropriately?
 - Did you at least attempt every problem? No exam problem should completely baffle you.
 - Did you write out something applicable to the situation, so as to receive partial credit, even if you did not know how to solve a particular problem completely?
 - Did you show all your work, so that it could be checked and understood, and some partial credit given even if not everything you wrote was correct?
 - Did you ask questions while taking the examination if you were unsure of anything at all (wording, what the question was really asking for, availability of data, and so on)?
 - If you were stuck, did you try to reason through any problem backwards, to help figure out how to get started?
 - If you began to panic during the examination, did you do something about it – get up, put some cold water on your face, calm down, and try to transform anxiety to productive energy?
- 7. Always feel free to come to my office hours with any and all questions, including questions about the problems or grading on this exam.** Get all your questions answered as soon as possible; do not put it off and let confusion, misunderstanding, or lack of understanding build up. This course material is learned cumulatively; future discussions in the lectures, and problems on later examinations, will rely on and a thorough understanding of many earlier concepts and methods. Learn these now, and if you make mistakes, learn from your mistakes.