



HHMI  
HOWARD HUGHES MEDICAL INSTITUTE

# What do I do Now? Laboratory Tales From Teaching Assistants 2003 - 2014

CHEM-601/BISC-603

## **Introduction to Laboratory Instruction<sup>1</sup>**

Course website <[www.udel.edu/chem/white/CHEM601F14.html](http://www.udel.edu/chem/white/CHEM601F14.html)>

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TA Teaching Cases  
Edited by Prof. Hal White

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## INTRODUCTION TO TA TALES

Financial support and incentives for offering *Introduction to Laboratory Instruction*, a course for first time Teaching Assistants in Chemistry and Biology, come from the Howard Hughes Medical Institute (HHMI) and their four-year Undergraduate Science Education Grants to the University of Delaware that began in September 2002, 2006, and 2010. The HHMI Undergraduate Program at the University of Delaware is dedicated to "*stimulating attitudes of inquiry*" in the classroom and in the laboratory. Traditional methods of laboratory instruction (e. g. "cookbook laboratories") often focus on transmission of information rather than cultivating curiosity and conceptual understanding. One of the goals of this course is to catalyze a shift in the perception of a teacher's role from the being source of all knowledge to being a facilitator of student curiosity and learning.

In addition to understanding the content and purpose of laboratory exercises, graduate teaching assistants must be prepared to make good decision in situations they have not encountered before. One way to introduce teaching assistants to these responsibilities is through teaching cases. A teaching case is an incomplete story in which an unresolved problem is presented and left for the reader or discussants to analyze and propose reasonable action. Frequently there is no obvious solution. Although prompting questions are not provided, one should assume that discussion of each case should address the following:

- What are the issues involved?
- What are some appropriate courses of action?
- What are the implications of these actions?
- How could the situation have been prevented or muted?

The 388 teaching cases that follow portray a variety of situations and are presented alphabetically by title and not in a topical order. The cases are listed by major topics in the index at the end and often deal with multiple topics. By reading and discussing cases, teaching assistants can become familiar with the types of problems they may encounter and the issues they should consider in dealing with them. Teaching assistants drafted most of the following cases as a final assignment in *Introduction to Laboratory Instruction*. The situations are fictionalized and edited but they usually are based on actual experiences. In order to maintain anonymity, the names of the authors are not associated with their cases.

The following chemistry and biology teaching assistants contributed to this collection:

In 2003 Lushanti Ariyananda, Piyal Ariyananda, Joseph Brobst, Subhendu Chakraborti, Thomas Daniel, Matthew Dreyfus, Laural Fisher, Fernando Jove, Vamsi Kodali, Haiguong Liu, Katie Heaton, Erin Heckler, Julie Lloyd, Kristy Longsdorf, Rebecca Mason, Trey Mills, Hong-Mu Pan, Mahitha Peddy, Danny Ramadan, Melissa Reinard, Ronak Rughani, Erinc Sahin, Daphne Salick, Dan Sauers, Megan Shalaida, Prabhavathi Srinivasan, Vinod Tarwade, Peng Wang, Jianfei Zheng, and Anne Marie Zimmerman.

- In 2004 Shalini Adla, Kouame Adou, Junjun Chen, Mayura Dange, Peter DeMatteo, Feng Gao, Sandip Kumar, Aaron Lee, Timothy Leftwich, Mark Madachik, Haiyun Meng, Wesley Monillas, Radhika Nagarkar, Amber Paschal, James Plampin, Obaidur Rahaman, Juan Carlos Rodreguez-Reyes, William Thielaker, Paul Tobash, Muhua Wang, Haixia Wu, Xiaocong Xie, John Young, and Xiaochun Zhang.
- In 2005 James Berry, Melissa Blackman, Stephanie Bolte, Holt Bui, Luke Ceo, George Craig III, Vidyadhar Daithankar, Andrew DeAngelis, Pengfei Guo, Matthew Hassink, Zhijun Jiang, Jason Kandel, Allison Kimball, Mary Kondos, Edward Miracco, Christopher Nelson, Jayasree Padmanabhan, Katherine Perrine, Carol Roach, Justin Spano, Jeffrey Spraggins II, Sangjin Sun, Tina Tao, Yuzhen Wang, and Christopher Zordan.
- In 2006 Christina Anderson, Sha Bai, Brad Bauer, Ryan Boris, William Bozza, Fang Dai, Joseph Davis, Yuqian Gao, Yun Han, Jennifer Jaje, Xun Liao, Pavan Kumar Mantravadi, Danielle Martin, Anil Pandey, Bayrammurad Saparov, Heather Schmidt, Gabriela Uceda, Guangbi Yuan, Yang Zhong.
- In 2007 Bridget Brennan, Ming Dong, David Gerstenhaber, Bryon Herbert, Yingxin Huang, Joseph Klems, Shuyuan Liu, Kaitlin Papsen, Craig Paquette, Mark Pennington, Hui Ren, Ritesh Sheth Daniel Smith, Jing Wang, and Qiongjing Zou.
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- In 2010: Sona Balasubramaniam, Samantha Brannick, Di Cui, John DiMeglio, Julia Eichhorn, Amber Geitter, Parkshit Gokhale, Eric Guardino, Tatsiana Haidziuskaya, Andrew Horan, Andrew Kastner, Aasma Khan, Jennifer Kurek, Jun Liu, Miho Maeda, Jesse McAtee, Jayme Paullin, Allen Pistner, Zhou Qi, Tracy Reisenberger, Cherish Skeen, Adam Tencer, Yao Yao, Jenna Yehl, and Yuchen Zhan.
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- In 2012 Baxter W Abraham, Smriti Akshaya Agrawal, Rachel E Andrews, Fowajuh N Ann-Desdemonia, Christopher M Arble, Daniel T Barnes, Corey H Basch, Brianne Bentivegna, Jason Burch, Meixi Chen, Andrew P Cinderella, Daniel C Cummins, Katie M Daisey, Randall J Derstine, Vijayarajan Devannah, Yichen Duan, Reetika Dutt, Celia Foster, Habte Ghebremichael, Christopher M

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### **A Cause for Concern**

During her first semester in graduate school, Ellen was assigned to teach three general chemistry recitation sections. In addition to attending lectures, the students taking this course were required to attend weekly recitation classes to take quizzes that served to record attendance and more importantly, to monitor their understanding of the subject. All of the students in Ellen's sections successfully fulfilled this requirement except for a freshman named Anthony. After Anthony failed to attend the first two recitation classes, Ellen told Professor James, who taught the class.

After his next lecture, Professor James spoke with Anthony about his absences. "Your TA tells me you've missed two quizzes. What's going on?"

Anthony apologized. "I don't intentionally try to miss class. It's just that I'm in ROTC and have to get up at 5:30 every morning. I'm also having some problems with my roommate, and I usually avoid the dorm most of the time. So I'm always tired and end up sleeping most of the day, and miss recitation, which I know is not good."

"Well, you need to learn how to balance your extracurricular activities with classes and deal with your roommate situation," Professor James said. "I'll excuse you from the first two quizzes, but from now on you need to attend class."

After their conversation, Anthony attended the next recitation class and was present for the exam given the next week. Unfortunately, he failed to show up to the next five recitation classes.

### **A Lovely TA**

Sebastian was an international TA for an introductory chemistry lab in which the students had set up a reaction and had to incubate an hour before they could collect their data. They killed time by talking and joking with each other.

Sebastian spent the time going around the room checking on the students' reactions and asking questions. At the end of class, he checked the equipment and cleaned up a few things. Suddenly he noticed that there was a drawing on the chalkboard. It was a heart with "to my lovely Sebastian" just under it. Sebastian laughed and wondered who in his class might have a crush on him.

Then he began to worry about it and he was afraid that other people would misunderstand it. In his home country no one would think twice about it, but what about here? He cherished his TA job and knew it was improper to get involved in any personal relationships with the students. If his supervisor saw the heart, could he get into trouble? He hadn't done anything wrong. Sebastian erased the picture quickly. He wished that people who had seen it would take it as a kind joke and that whoever put it on the chalkboard would not cause him any trouble.

### **A Sob Story**

Rudy, an international TA, had attended several TA Conferences and Seminars to help her get acquainted with the American teaching methodology and culture. She taught chemistry to non-science majors and was anxious about her first lab session because she had no prior teaching experience and had never dealt with American students.

Furthermore, most of her students were just starting college and had a lot more than chemistry to adjust to.

The first week of labs went well. Eager to implement the teaching techniques that she learned, she asked her students lots of questions and encouraged them to think independently. She realized that Americans have a greater social distance and refrained from touching her students even “the friendly pat on the back” that might be misunderstood.

Towards the end of the second lab period, a freshman girl came up to her with a question. Rudy responded with a probing question that she thought would help her student reason out the answer, an instructional tactic she had learned. Unfortunately, the distressed student started crying. Rudy instinctively hugged her student and comforted her. The student was embarrassed and left immediately. “Oh my God!” thought Rudy, “Am I going to get into trouble for this?” “Should I be even harassing students with counter questions?”

### A Specious Argument

Jane teaches two lab sections for microbiology. Among the course goals is for students to learn the standard format for scientific names. Thus the instructors and TAs strictly observe the scientific name format, especially in lab reports. Jane frequently reminds her students that a generic name like *Escherichia* is always capitalized while the species name like *coli* is not. However, both are italicized or underlined. She also cautions that lab reports will be docked points for errors in the format.

After the first report, many students got points off because they made mistakes in the scientific name format, but most of them got better in the second report. However, after Jane returns the fourth report, one student, Janis, walks to her in front of the class in front of everybody and asks her why she took off a point.

*Janis:* Why did I get this point off?

*Jane:* Ohh, You didn't underline the scientific name. Be careful next time.

*Janis:* What's wrong? I wrote it in the same way that the book writes it. They don't underline it in the book!

*Jane:* Yes, but in the book, they italicize the scientific name. When we write it by hand, underlining means it is italicized. It is a printer's convention.

*Janis:* NO, this is not fair! I didn't underline it because the book did not!!! This is not fair!

### A Stupid Graph

Prior to each lab period in CHEM 104, Michelle carefully goes through the lab manual to pick up on any details that might be misleading or confusing to her students at first glance. This day the lab dealt with the equilibrium constant,  $K$ , and how to determine it from equilibrium concentrations. She stressed the proper graphing technique of using a best-fit line on the graph and to have their graph fit the space they are given in order to get the most accurate readings. She also recommended that they do the graph in PENCIL in case they might need to adjust their graph.

Toward the end of lab period one group came to up to her with a question about their equilibrium constants. Of their five trials, four were within a suitable range, but their last value was an entire magnitude off. After reviewing their calculations (which were correct), she noted that the last point they were measuring did not fall on the graph that they created. They had “extrapolated” their graph farther out onto their data sheet where no graph existed and estimated their value. When Michelle suggested that they regraph their data to get a more accurate point (and a more accurate value), the group was not thrilled (they had graphed in pen) and argued that their estimation was not wrong when finding concentrations on a graph.

As Michelle tended to other students’ questions, she overheard the group discussing what to do. “She’s going to take points off because the last point isn’t on the graph,” Joe said. Tom said, “My calculation came out the same magnitude as the other values so I don’t care.” Upon, handing in his paper, Marty the third in the group member, stapled his paper five times. When asked by Michelle what he was doing, he explained, “I am just very frustrated. I worked so hard during this lab and I don’t want to get a bad grade because of some stupid graph.” Michelle restrained from saying, “Well apparently you didn’t work hard enough,” but wonders how she should go about grading these papers when not only did the students get the wrong answers, but knowingly left them wrong after consulting her.

### **After Hours**

One day after finishing his dinner of duck soup, Zeppo sat in front of his computer to check his e-mail. One of his students, Harpo had sent him a message concerning a problem with the lab report that was due the next day. Harpo and his lab partners, Groucho and Chico, wanted some help.

The lab in question was a heat of combustion experiment. In this experiment, one suspends a combustible compound with some combustible fuse wire in a bomb calorimeter. One ignites the compound and measures the temperature change. Apparently, Harpo had not weighed the fuse wire prior to ignition. The heat generated by the combustion of the wire is a small correction that is taken into account in this experiment. Zeppo decided to take a look at a copy of Harpo’s lab notebook pages that he had collected at the end of the that lab. He discovered that Harpo had weighed the fragments of the wire left after the explosion.

Zeppo checked the lab procedure and it instructs the reader to use approximately 10 cm of fuse wire to hold the sample in place. Zeppo debated whether or not he should weigh out a 10 cm piece of fuse wire and send the results to Harpo and his lab partners so that they could complete their calculations.

### **After Lab Angst**

Joe Jukes normally graded and returned his lab reports on time, with notes for the students to help them improve on what they did wrong. Despite Joe’s conscientious efforts, there was one very bright student, Tina, who came to him after almost every lab to point out exceptions and inconsistencies. Tina made Joe uneasy because she sometimes knew the material better than he did. It seemed that she came to reveal Joe’s

ignorance, show off her knowledge, and make sure she got a good grade. Her air of superiority really bothered Joe.

One week, Joe was swamped with his own tests and papers, and he was unable to grade the lab reports as well as usual. That week Tina came up after lab and bombarded him with issues about her grade. Joe was less prepared than usual and took a while to answer some questions, and was unable to answer some questions on the spot. Tina became more agitated and vehement after each answer, satisfactory or not. In exasperation, she said in the presence of several other students, “You know, you’re really dumb. How did you ever get into grad school?”

### **An Alarming Tale**

Mandi, a first year biology TA, was responsible for teaching an early morning lab at 8:15 Thursdays. So far, she had routinely arrived a half an hour early for her labs to be sure everything was in order. One Wednesday night, when Mandi was swamped with school work, she stayed up until 2:00 a.m. studying. She set her alarm, but because she was so tired, she forgot to turn the volume up on her phone, which was her alarm. The next morning when she was supposed to be up early, she slept through her alarm! She didn’t arrive to her lab until 9:30. She found it completely empty with no students in sight. She e-mailed the instructor and apologized profusely for being late. She also e-mailed her students to explain that she overslept and apologized for not being there for them. She felt so bad that she decided to give every student full credit on the lab they missed.

### **Angry Response**

John says he hates his biology class and often hands in his homework late. One day, he was sick and missed class. The next week, feeling better, John brought a doctor’s note with him. His TA, Abigail, gave him one week to make up his lab report and told him to e-mail her if he had questions or needed help. She even arranged to meet with John on Wednesday to talk about his final draft, but he didn’t show up. John came to lab the next day without his report. When Abigail asked where his report was and warned him that his grade would suffer if he didn’t complete it very soon, John’s dismissive and slightly arrogant response was, “I have other much more important classes besides this lab to worry about. I’ll give you my lab report tonight.” The lab report did not appear. Two days later, John e-mailed Abigail, asking her to meet him to talk about the report. Frustrated, Abigail ignored his e-mail. A couple of days later, John went to see Abigail during her office hours. She assumed he came for homework help, but he wanted to turn in his past-due lab report. “Too late,” she said. “You have a zero for that lab.” John was furious and started swearing and physically threatening Abigail.

### **Answer or Not?**

Jenny is a helpful and cheerful international TA. She never gets bored answering any kind of question. In lab 7, the students have to identify 12 unknown chemicals using chemical reactions and other chemical observations, such as pH tests, flame tests, and so on. During the lab, Lucy comes to Jenny with her test tube and asks, “Does this yellow

precipitate indicate nitrate?” Jenny replies, “Yes, you did a good job”. Then other students come with similar questions, asking whether their conclusions are right or wrong. Sometimes they are right. When they are wrong, Jenny helps them figure out what went wrong. Students from this honors class are resourceful. By the end of the period, they have figured out the key to which unknown is which chemical by sharing their ideas.

Later, another TA, who is teaching other lab sections of the same course, says to Jenny, “Hey, you ruined my labs. Because we share the same unknowns and my section takes place after yours, my students got the answers from your students before lab. Some of them did the whole experiment totally wrong, but got exactly the right answers.”

Jenny felt so sorry about this, but how can she refuse to answer students’ questions in her lab? If she says something to help them, they will get the answer and tell students in the other labs.

### **Anyone Interested in Learning?**

Frieda required her students to read over the experiment they were assigned before lab and write up a procedure. She had stressed in the beginning of the semester that the point of writing up the procedure before lab is so the students already have a procedure prepared to include in their lab reports, they can follow it during the lab to help them finish the experiment earlier, and they can even use the procedure for their quizzes. It would help them understand. However, she repeatedly noticed that several students did not write up their own procedure and copied from their neighbor. Frieda continued to urge her students to write up a procedure, but some of them still wouldn’t listen. After a few attempts, Frieda decided to assign 5 points to the procedure in order to motivate her students to write up their own procedure.

Soon after, Frieda noticed the same students copying the procedure from their neighbors again, so she gave them no points. The next lab those students objected. Frieda explained why they had a 0/5 on their procedure. Some students complained; “You have no right to take off points because you have no proof.” Others raised the issue that it was not stated in the syllabus and therefore should not be counted towards their grade. This comment brought up dissent among other students. Frieda now had her class arguing with each other and didn’t know how to handle this situation anymore. In frustration she blurted out, “Doesn’t anyone care about learning?!”

### **AP Chemistry for Naught**

Marty is in office hours and has eight students asking for help on the problem set due by Friday. He is almost done helping the students on one of the problems when a new student, Carrie, walked in.

**Carrie:** “Help me, I failed the test and I do not get anything the professor is talking about.”

All the other students start complaining about how poorly they did on the exam as well.

**Marty:** “It is still very early in the semester. You have many more opportunities to improve your grade. Let's work on this problem set and start working on understanding the material better.”

Carrie sits down as Marty finishes explaining the problem and within seconds.

**Carrie:** “None of what's on the board makes sense.”

**Marty:** “Well, where do you start getting confused?”

**Carrie:** “How do you know that it looks like that?”

**Liza:** “Well the question asks about a face-centered cubic unit cell of X with half the tetrahedral holes filled with Z. So the picture on the board represents that structure.”

**Marty:** “Does that make sense? Did that clear it up for you?”

**Carrie:** “No! None of this makes sense, I should be getting A's, I took AP Chemistry in high school and got the best grades in my class, and I never had to study.”

**Marty:** “Well, college is different from high school, especially when it comes to your studies.”

**Carrie:** “But, I shouldn't be failing. I am getting sick because I am studying so much and I have been coming to office hours for weeks, so I shouldn't be getting a bad grade, I am just gonna quit the class.”

### **Apathetic and Antisocial**

Very bright, but equally lazy, Fred is a student who routinely shows up late to class, unexcused. He achieves high grades on all worksheets and quizzes, demonstrating his understanding of the material, and never asks for assistance. In fact, he barely consults his lab group members during lab, preferring to work alone. He seems to have trouble working and talking with others. Frequently Fred turns in assignments late and as a result loses points. Even after his TA asked him if he was doing OK, and reminded him to turn in a late assignment before it was too late, he never replied and continues to ignore assignments and shows up late to class. As the semester nears its end, Fred's grade is a D, which does not represent what he knows or what he can do.

### **Apathetic TA**

In many ways Chad had been a model lab student since the beginning of the semester. He worked efficiently, finished his work in a timely manner, never questioned wearing goggles or waste disposal procedures, and never had any questions about the procedure, even difficult parts of the procedure that gave other students problems. Chad's lab reports started off so-so, but then suddenly they got very good. His TA, Brian, initially assumed that Chad just got serious about the course and put in the necessary effort to do well. Nevertheless, he was slightly suspicious.

Brian checked the next set of lab reports very carefully to see if Chad was possibly copying work from another student. However, nothing turned up. Brian decided to let this go for now thinking that he was just paranoid.

A week later, Brian saw Chad walking down the hallway holding hands with Lucy, a student from one of the lab sections that meets earlier in week and taught by

Daisy. Daisy takes her TA duties rather casually and doesn't seem to care. Earlier in the semester and she had chided Brian for spending so much time preparing for lab. Brian asked Daisy if she would let him see Lucy's lab report so that he could compare it to Chad's. Daisy said, "Do you mean to say that you actually read the lab reports? I just check them off and return them in lab. Why do you feel you have to be a policeman?"

### **Are Introverted Students at a Disadvantage?**

In her laboratory sections, Melissa based some percentage of the grading on the participation of the students in class discussions. In this percentage, students were evaluated based on their preparation and ability to show the degree of their preparation. However, this "pre-lab performance observation" method didn't seem to work for her introverted students even when Melissa tried to get them involved by asking questions directly to them. They consistently responded by giving short "escape-answers" that obscured their true level of preparation and ended up misleading Melissa. She frets that she can't evaluate the introverted students correctly. She wants them to become contributing members of society but fears instead the grading system pushes them deeper into their shells and may contribute to a feeling of failure.

### **Are You Making This Up?**

Mordecai was a first semester grad student teaching his first lab on a Tuesday night. However, when he got to the lab, it turned out that he had the wrong key, and because it was well after 5 PM, there was no one to unlock the lab. When the students showed up, he informed them of the situation and made plans to make up the lab, to which the students seemed relatively amenable. Because the next lab required running a gel (involving a 40-60 minute wait), it would be potentially possible to make up the first lab the next week without having to stay any longer. Mordecai e-mailed the students in the lab after speaking to the lab coordinator, and received the following reply:

"Correct me if I am wrong, but I thought that if a lab was canceled that it did not count for anything, therefore we wouldn't have to make it up. This happened to my roommate last year. Since it's not anyone's fault that it was cancelled, it should be excused without penalty. I will try to accommodate my schedule the best I can in regards to the consensus. Thank you!

-Rigby"

Mordecai was no more eager than the students to do the extra work, but he knew that the material covered in the first lab would be important later on.

### **Assigning Blame**

In an experiment designed to explore the effect of a mutagen on cell division (yeast and UV) students were asked to design their own experiment to examine the effect of UV on yeast. During the first week, students cultured yeast cells under UV-exposed

and non-UV exposed conditions. In following week, they counted the number of yeast colonies and compared the growth rate under both conditions.

The students came to lab well prepared and their designed experiment reflected their understanding of the lab. However, the experimental results were unexpected. Both the UV-exposed and non UV-exposed plates exhibited the same growth rate. Vinh, the TA, had run the lab experiment before and his results showed that the UV-exposed yeast should have a significantly lower growth rate. At first, he assumed that the students must have done something wrong. Nevertheless, since the students came well prepared and understood what needed to be done, he told them to write down whatever the result they had. But then the same problem happened to his second section. Vinh started to wonder what his students might have done wrong. And then he realized that it might be his fault. He didn't check the UV light in his sections in the first week and assumed it worked perfectly. Redoing the lab was not possible.

### **Attached at the Hip**

For the most part, Jewel had enjoyed being a TA for her general chemistry lab. About half-way through the semester a new student appeared in her evening section. She recognized the student immediately as the “problem child” from one of the other teaching assistant's lab. Jane, the other TA, was constantly complaining about how “Jerome” was slow, didn't understand things, had a language barrier, and had some personal hygiene issues. Although Jewel's first thought was, “Oh no! Why did Dr. Neal Bore let Jerome transfer into my section? I will never get home at a reasonable hour!” Her second thought was not to give in to her preconceived notions about Jerome, and give him the benefit of the doubt.

Jewel worked with Jerome each lab period. She tried asking him leading questions, so that he could figure out problems on his own. None of the techniques she used worked with Jerome though. He seemed to need constant attention, and he followed Jewel around the lab like a puppy dog. He wanted her to watch every step of the procedure he performed to make sure he was “doing it right”. Then when Jerome finally finished the experimental section of the lab, he would go on to the calculations and post-lab questions. Jerome would find Jewel after every problem and ask her to make sure his answer was right. Sometimes he would even bring his work up and sit right next to Jewel. She started to wonder, “Am I neglecting the needs of my other students? How am I supposed to give everyone the attention they deserve?”

### **Attention Deficit**

At the first few labs, students were too quiet. When Alice, an international TA, asked a question, nobody answered and they all looked at her quietly. However after a few more labs and gaining familiarity with each other and Alice, they changed from “didn't talk” to “couldn't stop talking”. They talked all the time and didn't focus. When Alice did a lab demonstration, they didn't pay attention. Afterward, during the lab they asked certain questions again and again that showed they hadn't paid attention to the demonstration. Although Alice reminded them to pay attention, they apologized and went back to chatting after a few minutes. They treated Alice differently from their professor.

They would ask, “Can you just tell us the answer?” Or, “You are the best TA, can we skip the quiz?” Alice felt she had lost control. She wondered whether she had been too nice.

### **Attention Please**

At the beginning of each general chemistry lab, Alex routinely gave a brief pre-lab lecture about the experiment and helped the students with any problems they had during the lab. But after some labs, Alex noticed that students were asking questions that should have been answered by his prelab lecture. He was sure it was because the students didn't pay attention to what he was saying. This annoyed him. He made his pre-lab lectures longer and repeated things several times to be sure students heard him. Students still asked questions that Alex felt he had already covered.

In Alex's TA prep course, the professor once said that lecturing was the least efficient way to transmit information. He also said that as learners people need to be involved in the subject and receive information in several different ways. It was the instructor's job to make that happen. Alex found that hard to believe. He was an excellent student and figured that students had a responsibility to pay attention. They should want to learn and it should not be the teacher's responsibility to cater to the needs of disinterested students.

As the semester progressed, the experiments got longer and more complex so that there was less and less time to devote to pre-lab lectures. Finally, Alex told the students that because so much time would be required for the next week's experiment, there would not be sufficient time for a pre-lab lecture. Consequently, he warned, they would have to come to lab well prepared if they had any hope of completing the lab in the time available. Much to his surprise, the lab went much better than he expected, and the students asked sensible questions.

### **AWOL**

Friends, Mary and Kat, missed CHEM lab for three weeks in a row after coming the first two weeks. Because they had said they weren't interested in the course and regretted having registered for it, their TA, Darla, assumed they had dropped the course. Furthermore, every missed lab is a zero and labs missing labs can only be made up the week of the lab, with instructor's permission. Even if the lowest score was dropped, both Mary and Kat would be failing lab. Darla attempted to contact them both by email, but failed.

Unexpectedly, the following week after the drop-add deadline, they showed up saying that they had been sick and had given a doctor's note to the course professor. They talked like the missed labs would just be dropped from their total grade and prepared to do the lab until Mary realized she forgot her goggles at their apartment. Rather than go back to get them, she decided to leave and just take a zero. Kat felt abandoned by her friend and seemed annoyed. Kat started working on the lab, but got frustrated partway through. Quietly, without a word while Darla was helping another student, she also left. Darla hoped to talk to her the following week but Kat did not show up. She asked Mary, “Where's Kat?” “How should I know,” Mary replied. However, Darla got the feeling it was a “you missed last week and I'll miss this week” situation.

The two showed up together the next week and then began missing labs again. Darla was unsure what to do. It also seemed weird that both girls were such close friends and had been sick for the same extended time periods. Should she give them incompletes or count the missed labs as zeros?

### **Babysitting Bryan**

Jane was a first year graduate student teaching three introductory chemistry labs. During the safety training in the first day of lab, one of her students, Bryan, cut himself. She filled out the paperwork and went over safety protocols with him. Next week in lab while boiling water for an experiment, Bryan spilled it all over the workbench! Bryan complained about the 'lousy' equipment the students had to use. Jane calmly explained to Bryan what he could have done to prevent such an accident. A few weeks later, Bryan broke more lab equipment.

Concerned about lab safety and exasperated at Bryan's lab techniques Jane decided on keeping a close eye on him. As the semester progressed Bryan broke fewer things, but he began to neglect the experimental protocol. Jane would have to patiently explain the protocol again. Bryan would have to redo the experiment; as a result he would take up more time than the three hours for lab. During another lab Bryan managed to break a flask and not follow the procedure. When Jane went to explain the procedure to him again, Bryan shouted, "Why do you keep telling me the same things over and over again? I'm eighteen, stop treating me like a five year old. I know what I'm doing!"

### **Bacterial Contamination**

Susan has TA'ed in microbiology for three semesters. She does not like confrontations with students. Everything is going well until on the third Lab report she discovered that several students had given the same wrong answer. The students had identified the organism that was plated in the last lab session as *P. aeruginosa* when in fact the organism was *E. coli*. *P. aeruginosa* had been used in the course the previous year. Susan suspects that the students turned in an old report. Jennifer, one of the suspects, is repeating the course because she was caught cheating last year and may have distributed the information to her friends in the course. Susan is not sure what to do next because she knows that if she reports Jennifer, it will likely end her college career.

### **Bad Day**

The day's experiment had three parts of and was going to run the whole of the lab period. Casey, the TA, anticipated a busy day and as expected was badgered with lots of questions. She felt she was not doing a good job answering all the students' questions. To make things worse, Casey got confused and thought one of the experiments hadn't worked. When Casey spoke to Eric, the lab supervisor about this he suggested, "Collect the data from another lab session running the same experiment."

Later that week during her other lab session, she realized that the experiment had in fact worked. Now she was in a quandary about how to explain this to her students,

especially now when the students had warmed up to her and assumed she knew what she was doing. She worried that the students would not take her seriously anymore and felt guilty that she had confused them.

### **Baseball Fan**

Jim was a big New York Yankee's fan. Unfortunately, several of their games in the fall were on Wednesday nights at the same time he had a lab. Even though he could not watch the game on TV, knowing the play-by-play progress of the game was almost an obsession. Every ten to twenty minutes, he would phone his friend Bud, "What's happening? What's the score?" He even brought a battery charger with him to the lab in case that his cell phone ran out of power! He talked about the team all the time. Whenever he got the news that the Yankees had scored, he announced the news happily to everybody in the lab.

Becky, his TA, saw this as a disruption and took Jim aside. "If you feel you have to make a phone call, could you please do it out in the hall?" she asked. This seemed to help a bit, but Jim still had to rush out of the room once in a while and continued to update the class on the game's progress. Becky fumed and the other students could tell she was annoyed. Bert, another student in the lab said, "Hey, Becky, cool it. The playoffs will be over in a week or two. Besides, it livens up a dull lab."

### **Bathroom Break**

This was Samantha's second semester of teaching. The first lab session went very smoothly except for Cooper who was a little aloof. Samantha noticed his behavior but decided to wait and not be judgmental with a premature assessment. During the next lab, Cooper was 10 minutes late to the class. Later, while Sam was helping the other groups of students to set up their apparatus, Cooper left the lab without asking. When Sam noticed Cooper's absence, she asked the two other students in Cooper's group where he was. They did not know. After an hour, Cooper returned at a time when almost every group, including Cooper's, had finished collecting data. Sam asked, "Where were you?". Cooper replied, "I went to the restroom". To which Sam asked, "What took you so long? You have been gone at least an hour". Although Cooper looked perfectly fine, he said, "I was not feeling well and I felt embarrassed to tell you in front of the class." Sam was unconvinced, but saw that Cooper's group members were furious and refused to share their data for the short report. Sam figured peer pressure would work better than anything she could say.

### **Being Cool**

Chad, the friendly TA for BIO-211, got along great with his students. They called him the best TA ever and thought he was pretty "cool", a label he really liked and cultivated. Andy, one of his students asked, "Hey Chad. Want a good time? Come on over to our party Friday night." Chad knew it wasn't a good idea, but he wasn't doing anything else and he figured it might be a good way to unwind from the grueling week. Chad thought it also might be a good way to get to know his students better.

At the party, several of his underage students were drinking and the aroma of pot was in the air. Andy came up to Chad and offered him a joint. Chad thought for a little bit and said, "I don't do that stuff, get me a beer instead."

The next week, the students got their lab reports back. Andy disliked his grade and approached Chad, "Hey, what gives? I thought you had a good time the other night." Chad replied, "It was great fun Friday night, but that doesn't mean you can forget about learning biology." Andy, a little annoyed, then said, "Well, what do you think your supervisor will do when he finds out you were bingeing with chicks from your class?"

### **Bench Sitter**

Michael, a varsity basketball player in Emma's lab section, never knew what to do in lab. He didn't care. He just had to pass the course to keep his sport's eligibility. He did not write up the procedures or look up MSDS sheets before the lab. Emma told him he couldn't get any points for the pre-lab. But Michael said, "I don't care about that." He spent most of his time chatting and playing on his cell phone in the lab. Emma warned him several times to quiet down and work on the experiment, but Michael said his partner could finish the experiment. He seemed to think that all he had to do to pass was show up. He even bragged that was true for some of his courses.

Two weeks later, Michael's lab partner Andrew came to Emma and told her, "I do not want to do experiments with Michael anymore because he does not do anything in the lab and, as a result, I do whole lab by myself." In response Emma told Andrew he had to find a new lab partner or join any other group. But all groups in this section refused to accept Michael. No one wanted him as part of their team and in a sense he had to sit out the rest of the semester working alone.

### **Better Late Than Never?**

Mike was a first-time TA. He tried to be punctual and usually came at least 10 minutes early for his labs. He taught three lab sections, all on Thursdays starting at 12:30 and ending at 10 pm. Everything ran smoothly until the next to last lab of the semester. On that day, he had an appointment at 11:00 am and he expected he could get back by 12:00 noon. Unfortunately, he got caught in the traffic coming back. So, he used his cell phone and tried to call one of his students who could let the other students know he would be bit late. No answer. He tried two more for whom he had numbers. No answer. Time was getting late. Unfortunately, Mike was unable to reach any of his fellow TAs who might have been able to cover for him on very short notice. He arrived at his lab session 20 minutes late hoping the students would still be there.

### **Beyond the Call of Duty**

About 20 minutes before the start of lab, Jenny, the TA, suddenly realized that she had forgotten to bring the students' last lab report with her. She knew they would be expecting the graded reports and it was her responsibility to return them on time as promised. It would take about 15 min to get the reports from her nearby apartment. A

couple of students had already arrived and were waiting in the corridor for the lab to start. Jenny hesitated briefly and debated whether she should go get the reports. At last she decided to go and told the students she would be back in time for the start of lab.

On her way back, she ran across a street without looking and a car hit her. Fortunately, it was not serious, but Jenny had no time to deal with the accident or her bruised legs and shoulder. She only got the phone number of the driver and one witness before she rushed back to her lab course, arriving about 10 minutes late and in a bad mood. Despite her discomfort, she thought she needed to put on a happy face and not let the students know what had happened. One of the students asked Jenny, "How was your week?" Jenny replied, "Pretty good considering what could have happened."

### **Bloody Logic**

Joe was a jovial student that got along with other students, but he did not take his studies seriously and it showed in chemistry especially. For example, "pre-lab questions" are due each week at the very beginning of lab. The rules for the lab state this clearly and are observed strictly. This means that a student, who is late, is not allowed to hand in the assignment and receives a 0. Joe seemed to think the rules could be bent. He entered the lab 5 minutes late, sweating and out of breath. He also had a considerably large scrape on his elbow. It was bleeding fairly heavily, and needed to be cleaned and bandaged. While Gretchen was finishing her lab introduction, her undergraduate assistant helped bandage Joe's elbow. When he finally sat down, he started writing furiously and copying out of his lab manual right in front of Gretchen!

Soon Joe handed Gretchen his "prelab" assignment. "Here you go! Here are my pre-lab questions." Gretchen replied, "I'm sorry I can't take them. You came in 5 minutes late to lab, and I saw you writing your pre-lab questions while I was lecturing." To which he retorted: "But, Buuut, I got hurt riding my skate board on my way to my buddies place! You saw my arm! It was a bad scrape!" Gretchen was unsympathetic. "I'm sorry but you should have had your assignment completed before heading to your buddies place, and lab. Your bloody arm happened after your work should have been done."

### **Bloody Mary**

In a large class, it is amazing the variety of students a TA encounters. Some have lived their lives inside buildings or in an urban environment where biology comes from a textbook or magazine. This week's lab was studying osmosis using red blood cells from sheep blood. Katie's morning lab ran smoothly. However, in the night lab one of her students, Mary, came to her at the start of lab saying she was anxious about the lab and didn't want to work with blood. Katie, who had grown up on a farm, told Mary there was nothing to worry about, she would be fine, and proceeded with the lab. About an hour later, Katie noticed a commotion in the middle of the room. Mary had cut herself with a test tube and was almost hysterical. Mary started stammering questions about possible infections she could have contracted and asking if she might die.

### **Brilliant Trouble**

Regina teaches a lab that seems to have a lot of students who have difficulty with chemistry. They often need her help during the lab. She tries to answer their questions but many times they don't seem to understand. She hears the same simple questions over and over again. However, in one of her sections, she has a really brilliant student, Jack. He understands chemistry, always knows what to do, and writes excellent lab reports.

The other students have also noticed Jack's talents. After a few weeks of lab, Regina notices that she is getting fewer questions. The students prefer to ask Jack rather than to ask her or try to work out the answers for themselves. They no longer think by themselves, but only wait for Jack to figure out the answers. Jack seems to enjoy the attention. In fact, he started walking around the lab almost as if he were the TA, particularly when he has finished the lab and could leave.

Every once in a while Jack makes a mistake on his lab report. While Regina is amused to see the same mistake on over two-thirds of students' lab reports, she is perplexed on how she should deal with Jack and how she should grade the lab reports when it is obvious who is doing the work.

### **Broken Computer**

Erin used computers, but she never felt comfortable dealing with computer problems. Thus she was apprehensive about administering a computer-based quiz in her lab sections for the first time. True to her worst-case fears, she found that the computer didn't work when she came into the lab. It was time to start the lab and she didn't have time to get others to fix the computer or print out hard copies.

She decided to give the lab intro on the blackboard and asked another TA if he could let her students take their quiz in his lab. That TA agreed and two labs had quiz together. But when Erin's students came back after the quiz, she heard some of them complain that it was unfair. The unexpected disruption and change of plans put her and her students in a bad mood. She felt upset and thought she had made the wrong decision. That was reinforced when she graded the quiz.

### **Broken Hope**

Upjo, an incoming international teaching assistant for a General Chemistry laboratory, is teaching her third class. The experiment is about properties of hydrates and needs to be done extremely carefully because it is teaching students new techniques and familiarizing them with significant figures in addition to the chemistry concepts. First the students must use a balance to determine the mass of a crucible without and then with a hydrate sample and from those numbers calculate the mass of hydrate by a difference. Then they have to heat the sample to remove the water of hydration, cool the crucible, and weigh it again. They determine the amount of water lost and the weight of the remaining sample. And finally, they calculate the percent by weight of hydration and determine the identity of the unknown sample. This procedure takes a long time to complete all of the steps.

Claire and Peter are lab partners, and their experiment goes well at the beginning. When Peter was removing their sample from oven with a pair of tongs, he was

momentarily distracted and he dropped the hot crucible on the floor. It broke and their sample was lost. The laboratory period was more than half over when this happened. Although Peter dropped the crucible by accident, Claire was not sympathetic. She was had just begun college and wanted to get good grades. She went over to Upjo with tears in her eyes, "Is there any way for me to make up this lab? It's not my fault! He broke the crucible, not me!"

### **Brownie Points**

Relations developing between students and teaching assistants can be quite interesting. Being only a few years their senior, one might find new friends in his/her class. However, just as parents must love and discipline their children so must a teaching assistant to his or her students as Penny soon discovered.

She had pondered her new position as a graduate teaching assistant with much trepidation. Her first class was full of eager, friendly "children" who instantly befriended her and eased her anxiety. While the lab sessions ran smoothly, grading their lab reports was a painstaking and agonizing task. This was noticeably so for their first lab report. After grading the first section, Penny realized two of her students, Nicole and Diane, turned in the exact same report. She was unsure how to handle the situation and consulted her supervising professor. They decided to warn the students of the severe consequences for students caught copying other's work and put them on notice that they had to do their own work.

As the semester progressed, Penny became increasingly overwhelmed, and could not grade as strictly as she would have liked. Halfway through the semester, she discovered Nicole and Diane had again submitted reports with an identical section and some identical but incorrect calculations. Further investigation showed these two were not only lab partners, but also roommates. Additionally, Nicole was doing much better than Diane on the exams. Nicole often helped other students in lab when Penny was busy with other students. Both students were friends of Penny's and had created a website fan club in her honor. Turmoil and indecision plagued Penny. Both had the same calculations, but they made the exact same errors and their error analysis section was verbatim the same.

### **Burnt Fingers**

One Thursday, Kevin, a student from another section, came to Miss Yang's lab to makeup an experiment he had missed. During the lab, Kevin came over to the Miss Yang holding his fingers and obviously in pain, "I burned my fingers when I tried to pick up the Gooch crucible." Miss Yang didn't know how serious this accident was and wanted to phone the health center. But then Kevin said, "It's really not that bad. You don't need to call anybody." So Miss Yang ignored it. After a few minutes, she found Kevin running cold tap water over his fingers. Two of his fingers hurt very much. Miss Yang wasn't sure what to do. She decided to send him back to his dorm, finished the last part of Kevin's experiment, and asked one of his classmates to bring his notebook to him. After the lab, Miss Yang finished the accident form and reported this accident to the professor.

### **But the TA Doesn't Like Me**

After receiving a poor grade on the first test of the semester, Jane had gone to see Prof. Bliss with a chip on her shoulder. "I tried everything I could to learn the material, but Bill, the TA, doesn't like me and he won't help me with my questions. I tried to talk to him, but he was rude and mean. He doesn't like me." Jane thought it was unfair that she was in the section with Bill and wanted to be in Misi's section because she heard how nice she was and how she helped everybody out. Jane then told Prof. Bliss that she should not be responsible for the grade that she got on her test because the TA wouldn't help her and she demanded to be moved into Misi's already full section.

### **But we did the work...**

Stella and Kyle always seemed in a good mood even when their experiment didn't give perfect data. When Stella came to lab wearing shorts and Vicky, her TA, sent her to get changed, Kyle happily prepped their experiment. Stella made it back quickly without complaint. In this experiment the lab partners had to standardize a hydrochloric solution they would use for the titration of their unknown base. The main goal of this experiment was to demonstrate good reproducibility by having a standard deviation below 0.5% and determine the percent composition of their unknown.

-By the end of lab, Kyle and Stella realized their data were bad. They had not waited long enough for the standard solution to mix well, giving them different numbers from one trial to another. Because the lab was over, Vicky told them to attend a different lab section to repeat the experiment. Kyle and Stella said they couldn't and asked if they could just take someone else's data. Vicky told them no, because the point of the lab was to demonstrate good technique. Their report appeared on time. As Vicky suspected, their unknown was completely off from the one assigned and their standard deviation was below 0.5%. An email exchange revealed they had used someone else's data. Vicky gave them a poor grade for the lab. Kyle who had interacted well with Vicky before, was indignant. "Why should we be penalized? We showed up for lab, did the experiment and analyzed data just like everybody else!"

### **"But you said..."**

Ashley, is one of the most active and diligent students in Amy's TA sections. She always listens to the pre-lab lectures about the experiments carefully, taking notes and asking questions. Amy thinks highly of Ashley. But good preparation does not guarantee good results. In one time-consuming lab, Amy was checking on Ashley's group and quickly realized that they must have done something wrong. Their result for the unknown was far from the true value. She decided to help them find out the possible reasons and try her best to get things back on the right track. She asked Ashley a few questions and made her realize that they had missed one critical step. However, it was too late to redo the experiment, which upset Ashley. She kept asking Amy whether it was OK to keep the incorrect data and write up their lab report. Because they were already clear about their mistake, Amy nodded her approval.

The according to the grading rubrics, which are standardized, bad results for the unknowns are not eligible for full credit. When Amy came to Ashley's report, there was a sentence written right below the data: *You said* it was OK to keep the data, so you won't take my points off, right?

### **Butterfingers**

Michelle is teaching Microbiology for the first time and is really nervous. Everyone has said that Microbiology is the most difficult biology course to teach. The first lab is about using the microscope. During the lab, most of her students have a difficult time grasping the concepts and techniques and Michelle has to run back and forth from student to student. The students need to observe bacteria on a limited amount of pre-prepared slides. Some of her students broke slides with the objective lens by focusing the lens so low that it hit the prepared slides. By the middle of the lab Michelle is feeling stressed out and rushed and is trying to show a student how to properly focus. She focuses too quickly with a low objective lens, assuming that that objective does not even get low enough to touch the slide, but it hits the prepared slide and breaks it. She disposes of it properly but now another prepared slide has been lost and she has to report any slides that have been broken. She is upset about setting a bad example and is even more nervous.

At the end of lab, one student wrapped the cord around the ocular lenses wrong and when Michelle goes to fix it, she fumbles with it and the ocular lens pops out and lands on the floor. While the lens did not shatter, the lens popped out and needs to be reported so it can be reassembled correctly. She is afraid that if she takes responsibility for what she broke then the professor will think she is not capable of teaching labs and will be fired from her teaching position. She could easily report that the students broke the equipment, since they are expected to make those sorts of mistakes and no one will get in trouble.

### **Caller ID**

Peggy never seemed to be on time and had already missed a lab. So, Greg, her TA was not surprised when she was not on time. However, he had devised a solution.

"Hey, Betsy, you're a friend of Peggy's, aren't you? Do you have her phone number?" Greg got Peggy's phone number and borrowed another student's cell phone and dialed. A sleepy voice answered. "Hello. This is Peggy. Who is this?" Rather than identify himself immediately, Greg asked, "Where are you? What are you doing?" and then after the response, "This is Greg, your TA. We miss you. Are you coming to lab today?" An embarrassed Peggy showed up about 20 minutes later. The whole lab saw what had happened. They also knew they would be next if they were ever late.

### **Can I get your number?**

Walking into her first lab section, Susan was surprised to see that had a boys-only lab. Surprisingly, she had only two girls in her other lab section. As if she weren't nervous enough trying to gain the respect of students only two years younger than she, now she had to gain the respect of a bunch of male chemical engineers without trying to get picked on for being a girl. Those concerns turned out to be nothing. The students were

friendly and didn't argue. In fact, she ended up playing on an intramural soccer team with a few of them because another friend of hers had played intramurals with them before. One night before the start of the season, one of her students asked her, "Can I get your phone number?" (so that he could tell her what time their game was scheduled). Unfortunately, he did this right in front of the lab coordinator who raised his eyebrows and gave a little frown, but said nothing. Susan knew what he might be thinking.

### **Can we move on?**

Sharon teaches a biology course required for non-majors and works hard to generate students' interest in the lab activities. The labs are designed such that, if all activities go well, the students can leave 30 minutes before the end of the scheduled lab time. Sharon usually writes an ordered list of the lab's procedure on the board so that students have an idea on what is coming up. In one of the sections, where the time of the lab overlaps with lunch time, it irritated her that students nagged and asked: "Are the remaining activities long?" "Are we going to be out of here early today?" Her answer depended on what they were doing, so she might say, "Yes, if you understand and do it correctly, you will finish early" or "No, the lab is long today."

Clearly her students didn't want to be there and it bothered Sharon a lot. They just wanted to finish and leave. One day, an impatient student in a hurry to get out of lab was rushing Sharon in her presentation. "Come on, we understand. Can we move on?" Sharon snapped back, "Do you think you will stay in the lab forever?" The student replied sarcastically, "We already are!" Sharon wasn't about to tolerate the rudeness. "Look, I am here to explain things for you and I need to make sure everyone understands. You are here to learn and not to worry about when the lab is done. When everything completed as planned, you will be able to leave. And I do not want to be asked again whether we are finishing early or not." Later, Sharon apologized to the student for talking that way to her in front of other students.

### **Candy TA**

Jessica is a good tempered TA with shining smile. Students like her very much; they enjoy talking with her, asking her any kinds of questions. Jessica also spoils her students with candy that she shares with them after lab to celebrate birthdays, Halloween, Thanksgiving, or whatever she can find to celebrate. Students all call her "Candy TA".

One day she put her closed bag of candy on the lab bench, while she helped students do their experiment. Steve saw the candy in the bag and, on his own, distributed it to others in the lab. When Jessica came back and saw that the candy was taken and being eaten, she exploded with anger not only because the student didn't ask, but even more importantly, because food and drink in lab is forbidden. Once another TA didn't stop a student from eating breakfast in the lab and was caught by a professor who had the TA fired. Steve, who thought his action was just a simple prank said to Jessica, "I know you brought the candy here for us. I felt hungry, so I ate some. Don't over react. Be nice, Candy TA !"

### **Canvas Gone Wrong?**

About 9 weeks into the semester, one of June's students in her Biology lab emailed her about one of the assignments she had just graded. The assignment was a post-lab assignment from the previous week and was submitted online. Billy did not have an assignment submitted, so June had given him a zero out of five on the assignment. Billy insisted that he had submitted the assignment and that there must be something wrong with the online grading system, Canvas. June asked if this had happened with any of his previous assignments, and he said it had happened the week before as well. Interestingly, all of his earlier assignments and the assignments of the other students were submitted with no issues. Nicole had him email his assignment to her. It was missing many key components and was poorly executed.

### **Case of Hysterics**

Wayne, a third year TA, felt confident he could handle any issues that came up in his labs. At the beginning of one lab period, Samantha, told him that her friend from home had a serious car accident and was in the hospital. Samantha asked if she could step outside every so often to check her phone. Steve saw no problem with this. Later in the lab he heard Samantha wailing in the hall outside the lab. Her friend had passed away. She was hysterical and inconsolable. Several students from the lab attempted to calm her down and eventually escorted her back to her dorm. In the end, Wayne decided that there were more important things to worry about than the fact that five students didn't finish the experiment and the rest of the students probably will remember the incident rather than the concepts they were supposed to learn from the lab.

### **Caught Between a Rock and a Hard Place**

It was the first day of the semester and Bob was extremely excited to TA his first lab. He had everything all planned out, from experimental procedural details to basic ground rules. There were no worries in his mind because he had a plan. What could possibly go wrong? At his first lab, Bob explained he would be giving a quiz every week about that week's experiment. Several students groaned about this, but no one seemed to have a huge issue with it. After lab, Anthony came up to Bob and explained that he was a student with disabilities. He explained to Bob that the Office for Students with Disabilities had already approved him for extra time and to take his exams and quizzes in their office. Seeing no problem with this, Bob agreed to send his quizzes there every week and for Anthony to just come to lab after he was finished.

The following week Bob handed out the quiz and noticed that Anthony was there. Although Bob had sent a copy of the quiz to the Office for Students with Disabilities, he figured that Anthony had chosen to take the quiz with the rest class and not at the OSD. After ten minutes, when Bob saw that most of the class had finished, he announced that the class could take five more minutes to finish up. As he collected the quizzes, he noticed that Anthony was extremely upset. When he asked him what was the matter, Anthony said, "That quiz was extremely unfair. I am supposed to get as much time as I need." Bob was confused, but it wasn't a time to publically discuss Anthon's previous disabilities request. Furthermore, he wanted to tell him that the quizzes were only going

help his grade, not hurt them in the end. But, he didn't want Anthony or others to stop preparing for them.

### **Caught in the Act**

The lab taking place this week involved the use of halogenated organic solvents and reagents. Bob, a new TA only in his first semester of graduate school, was an easygoing TA who did not like to reprimand students or cause uneasiness within the lab. While going through the pre-lab lecture, Bob specifically mentioned that the halogenated compounds being used were very toxic to the environment and should not be dumped down the drain or put into the trash can reserved for broken glass, used gloves, and paper towels. He also mentioned that because it is very expensive to dispose of halogenated compounds, no more than the required amounts of the reagents should be used.

While talking to some students about how their experiment was going, out of the corner of his eye, Bob noticed a student at the other end of the lab look around suspiciously to make sure no one was watching what he was doing. The student then took all of his used test tubes (which should be saved in the first place) and threw them into the trash, along with the alkyl halides that were in them. When Bob confronted the student, the student replied, "There wasn't that much stuff in the tubes. Besides, you said it is really expensive to dispose of the halogenated waste properly."

### **Caught in the Middle**

Susan teaches for Professor Lori's introductory biology class. At the beginning of the semester, Susan received clear expectations from Prof. Lori about class expectations, grading, and other essential details that all TAs should expect from their supervisor. Everything seemed to be going ok. Her students' grades were acceptable and everyone seemed to be fine until the middle of the semester when her students started freaking out about their grades and as a result started picking on everything. The majority of her students completed their lab reports in the requested format. Three students did not and seemed to make no improvement week to week.

Susan would typically grade their reports and on each student's grading rubric, explain exactly why she took off points and where exactly she took off points. Rather than making their complaints to her, these 3 students would go to Prof. Lori and complain. They would exchange e-mails and discussions in her office and get back to Susan telling her exactly what Prof. Lori wanted her to do. To be sure that the students reporting was accurate and without knowing what exactly had been going on, Susan would go Prof. Lori where she would be told something else. When Susan did exactly what she was told, she was then regarded as the bad person caught in the middle.

### **Cell Phone – Turn off?**

It was the beginning of Ashley's first lab of a long day. The lab was going to take the whole three-hour period, and considering her back-to-back labs, lunch was not an option. She jumped into her pre-lab discussion in an effort to get her students started as

fast as possible so that they would have more time to complete the lab. Halfway through the pre-lab while explaining the solubility rules, Ashley's phone began to vibrate in her back pocket. Cursing herself for not turning it off before the lab started, she continued with her explanation to the students.

After pre-lab, the students broke up to begin their experiment. Once again Ashley's phone began to vibrate. When she took it out to silence it, she noticed it wasn't one of her friends but her mother calling. Assuming that Mom had just forgotten that Ashley was in lab all day, she silenced the phone and left it on top of her things before she began to circulate around the room to answer questions. As she walked around the benches, she noticed her phone light up again and decided to check it out. Three missed calls, two voice mails, and a text message were waiting when she opened the phone. Not wanting to check her voicemail in the middle of class (after all she wouldn't let her students check theirs), she checked the text message instead.

"There's been an accident, come home immediately..."

### **Cereal Delusions**

Even though it was his last lab of the week, Max felt his Saturday morning lab was the most challenging. Many of the students got assigned to that lab because they registered late and it was the only one open. Other students chose the lab because they worked and were going to school part-time. Many of the students stayed up late Friday night and had difficulty getting to lab on time and frequently skipped breakfast.

During his prelab presentation, Max noticed Julia sitting in the far corner of the lab with her back to him. He could tell that she didn't have her goggles on. When he went over he discovered that she was secretly eating a bowl of Cherrios. When he confronted her, she said, "Oh, I thought we could have food as long as we weren't in the middle of an experiment. I haven't weighed out anything yet."

### **Certified Ignorance**

At the beginning of the semester Johnny was annoyed by how much time everyone was saying he had to put into teaching. "Three sections!" he proclaimed, it kind of put him off about the whole teaching thing. After a few weeks of going about the motions he started to get the hang out of it. He felt he was really helping some of the students learn and grasp the material. He was getting into a good routine.

A few weeks later he was teaching an unfamiliar lab. He shook it off and jumped right in. The lab was going great, the students had all read the procedure and knew what to do and it required minimal input by Johnny to keep the ball rolling. After the wet part of the lab the students were working on the post lab and one of them asked Johnny a question. Being an astute scientist, Johnny figured he knew the answer, rather, he assumed he did.

After a few minutes of explaining his answer, he began to wonder whether he really understood. Suddenly, his great explanation didn't make sense any more. But he

continued on and finished up his “authoritative” discourse. Privately he breathed a sigh of relief that everyone seemed satisfied.

The rude awakening came when Johnny was grading the lab reports. After looking in the answer key he noticed that everything he had taught the students about that question was wrong. He had explained, and reasoned to himself, the wrong answer to everyone! First he was embarrassed but next he was confused, “Should I give credit to the students who put down the answer I explained? But it’s wrong and they should not take everything I say as fact?”

### **Changing Directions**

The lab manual said, “Heat the hydrated salt sample for at least 15 minutes to remove the water.” However, Ripley observed in the two labs he supervised earlier in the week that 10 minutes would do fine, so he told the students of his last section, “Ten minutes of heating is good enough.” He figured that would save time. The instructions worked for all but one student, Barry, who got an unreasonable weight for the heated sample.

Rip asked, “How long did you heat the sample?” Barry answered, “Ten minutes like you told us to do.” Rip responded, “That may be so, but from your final result, it looks like you did not heat the sample properly or long enough.” Barry insisted that he had followed the directions and asked Rip to check his calculations. He did and found no mistakes. A puzzled and worried Barry said, “So it must be the 10 minutes heating that was not long enough. I don’t want to lose any points for that, especially since the lab manual says heat for 15 minutes.”

It was early in the semester and Rip didn’t want Barry to be discouraged, so he tried to explain some things about experiments. “See, 100 other things in your experiment might go wrong and I have no way to check them. Heating your sample for 10-15 minutes is good enough provided you heat it properly. However, if you have a too low flame or unsteady flame (flame going outside due to wind and not focused on the bottom of the vessel containing the sample) your sample will not be ready even you heat it all day long.” Barry was not happy with this explanation and again asked about his grade.

Ultimately, Rip gave Barry full credit, but he decided that in future would not deviate from what the manual said.

### **Cheat Sheet**

During the first week’s lab, as Chad was walking around the lab thinking everything was going well, he noticed Sam looking at a piece of paper while filling in answers for the lab data sheet and questions. Recognizing the paper as a prior year’s lab report, Chad nonchalantly asked, “What cha got there?” “Oh, it’s nothing,” replied Sam. Chad then asked to see it. Sam put it away saying it was for another class.

Being a new TA, Chad was unsure what he should do for what he considered blatant cheating. Should he kick Sam out of lab and fail him for the lab? Or, would that be that too harsh, especially on the first day? He also didn’t want to make a scene in front

of the other students in the lab. In the end he just said, “Don’t ever let me see something like that again. You are only to do your own work in this lab.” Sam complied without protest and completed the semester without another incident. Chad was happy things worked out well, but he still wondered whether he had done the right thing.

### **Cheating: To Report or Not?**

As a part of Jeff’s job as a biology TA, he had to grade various worksheets throughout the semester. At the first day of his lab, he emphasized that students should work in a group, but they had to write down their answers separately. After he graded the first worksheet, he found that students in a group still had similar answers. So, he went to the course instructor and talked about it. The instructor suggested that if it is not an exact copy, and if you do not have a solid proof, you cannot blame the students for cheating. All the while, the instructor kept telling that he hated to deal with it. He suggested that Jeff could warn the students about cheating.

Now, Jeff thought that if the instructor doesn’t care, why should he? So he stopped checking for plagiarism. One day he saw one student taking a picture of the worksheet of his lab mate. When Jeff graded the worksheet, he found that the same two students had the exact copy of each other. Then he started looking at the worksheet of other students in other groups and found that they also had cases of cheating. Jeff is in a dilemma now. It is the second to last lab for the semester. In one way, he thought that it is just few labs, and if he does not report it, nobody will be in trouble. He also recalled how his instructor told him that he did not want to deal with all these. On the other hand he thinks, it is his duty to report the cheating to the instructor.

### **Chemical Waste Disposal**

According to Occupational Health and Safety Committee, all heavy metal wastes must be properly disposed of in clearly labeled containers. In a laboratory experiment involving substantial wastes of cobalt, Hassan, a quantitative chemistry lab TA, realized, in the middle of the experiment, that all heavy metal waste containers were full. Yet, the students needed to get rid of the waste they had just generated in order to continue the experiment. In an attempt to solve the problem, Hassan checked every place in the lab for an empty bottle or other container. Nothing was found for the purpose. He quickly surveyed nearby labs for a container. Every door was locked. Meanwhile, the clock was ticking and one of the students asked: “Why can’t we just dump it down the sink? By the time it gets to the Delaware River, it will be infinitely diluted. Besides, I have a test after this lab and can’t wait around.”

### **Chemistry**

Tim applied to college as a history major. However, his parents, who were chemists, could not imagine how a history degree would be worth anything when he graduated. “You need to change your major to something useful. Why should we spend all of this money on your education and have you be unemployed and living at home in four years?” All summer long Tim was tormented by such remarks. As soon as he got to

college, without telling his parents, he changed his major to chemistry and was able to add all the courses he needed. He had done well in high school chemistry, but he really hadn't warmed to the subject. "Perhaps", he thought, "I can learn to like chemistry. After all, there are many stories of people who end up doing things they never thought they would like."

As misfortune would have it, his roommate made things worse. "I can't believe you sold out. Man, you need to have your head examined. When are you going to grow up and make your own decisions?" As might be expected, Tim's first month of college was a disaster. However, one bright spot was Sara, his understanding TA in general chemistry. She sensed that Tim was bright and could do much better. One day after class, she took Tim aside. "You don't seem too happy. Is anything wrong?"

Within minutes Tim was almost in tears and telling his life's story. He didn't understand the textbook and hated to do experiments. He felt like a robot doing what other people told him to do. Sara sympathized with Tim because she had a friend who had had a similar experience. However, she felt Tim needed more help than she could offer.

### Class Conflict

Jill Kallikack had come from humble beginnings and was doing pretty well as a biology major. Chemistry was not her best subject, but with work she managed pretty well. The experiment of the week was to determine the equilibrium constant for the reaction of Iron (III) with thiocyanate anion. Things went smoothly, but Jill and other students were having trouble with the calculations and time was running out. Students for the next lab were waiting to come in.

George Rothschild, the TA, told Jill and the other 12 students, who were still working on their calculations, to move down the hall to an empty classroom where they could finish up their post-lab to turn in. Jill told George that wasn't possible for her because she had another class that she had to run for. George said, "That's okay, work on it at home and put it in my mail box first thing in the morning."

When George returned the graded post-lab sheets the following week, Jill's was not among them. She got a zero for not turning it in. She felt that was not fair because the other students got help from him that she didn't get and needed to complete the assignment. Furthermore, he didn't answer the e-mail she sent him about a question she had.

### Class Not Taught

There once was a TA named Gail,  
She tried to teach but to no avail.

Whenever she spoke,  
Her students just joked.

When the tests were handed back,  
They saw she cut them no slack.

No matter the threat,  
Her students didn't fret.

Now that the term draws to an end,  
The class grade, they cannot amend.

But unknown to Gail, now paled,  
Is whether she or the students have failed

### **Clean Lab**

The other TAs could see that Max had a classic Type A personality. He kept his desk neat, finished all of his assignments completely and on time, wrote neatly, and paid attention to detail. In lab he was very organized, having his students follow directions carefully and safely. While these traits served him well and were desirable for success as a chemistry graduate student, Max couldn't see why everyone was not like him and thus showed little sympathy or understanding toward others who were a bit more relaxed.

Max had two labs on the same day, one early in the afternoon and one late at night. While the first lab was always clean when he entered, Max routinely found his evening lab a complete mess; glassware was often left dirty and air-sensitive reagent bottles were left open. He knew that there was one lab session between his afternoon and evening lab, and soon learned who had that lab. After one particular week where test tubes with bromine were left out, Max confronted Angelina rather tactlessly about the mess. Angelina, a bit fragile first year TA struggling with the demands of graduate school, politely apologized, but inside she felt wounded. The following week, Max found the lab in a mess.

### **Clear Solutions Turn Pink**

Jim was overseeing an experiment involving the titration of a dilute hydrochloric acid solution with sodium hydroxide. Students monitored the titration with phenolphthalein, an indicator that changes from clear to deep pink at the endpoint. During class, Jim noticed that one group of students was not properly labeling their solutions, a important oversight that could prove to be a hazard because they were all the same color. However, he did not say anything to them because he had disciplined them earlier that day for wearing their goggles upside-down. Later, one of the two students, Chester, asked Jim why his sodium hydroxide had turned a deep pink color rather than the acid. Jim asked if the chemicals were properly labeled and if the acid was indeed being titrated with the base as expected. "I don't know. You tell me," responded Chester. Jim told him to dispose of the chemicals since they were contaminated and no longer useful. Chester proceeded to pour them down the sink.

### **Coffee Shop Blues**

One afternoon, Bob, a new TA, walked into a local coffee shop with a friend to grab something to eat. He noticed Anne, one of his students, working intensely on an assignment with friends at a nearby table. She did not look up at him, so he did not bother to say hello to her while he was waiting to be served. Additionally, he was unsure whether or not she would find it uncomfortable if her TA interrupted with some casual chit chat.

At the start of the next lab period, after Bob finished giving out instructions, Anne said loudly in a way that others could overhear, "Hey Bob, I saw you at the coffee shop yesterday!" Bob replied, "Oh yeah I saw you too. I really needed a coffee after my class was over." With a hurt expression, Anne said, "You saw me there? Why didn't you say hello? Do you not like me or something?"

Faced with the unexpected reaction and wanting to start lab as quickly as possible, Bob hesitated, then told Anne that they could finish their conversation after class. Unfortunately, Anne assumed that Bob was ignoring her question, avoided eye contact, and seemed uncooperative for the rest of the lab.

### **Coming Up Short**

In TA meetings lab safety was stressed. It was the TAs responsibility to ensure that students wore their goggles at all times while in the lab and wore gloves when handling chemicals. The dress code was slightly more lenient. Students needed to have closed toe shoes, but were permitted to wear shorts or skirts if they extended below the knee.

For the first three weeks of lab, one of the students, Mike, came to lab wearing shorts, but Melissa permitted it because she thought his shorts were far enough below his knees. During the fourth week of lab, the lab coordinator came into the lab, inspected the students, and noticed that Mike was wearing shorts. He admonished Mike for wearing shorts that were not far enough below his knees and sent him home, despite Mike's pleas to stay and finish the lab. Melissa felt really conflicted because she had been telling Mike that his shorts were suitable for lab, but she also didn't want to disrespect the lab coordinator when he felt strongly about his decision in sending the student home.

### **Compassionate TA**

Some students can not finish their experiments during the lab period. Some cannot follow the guidance on the manual and want to repeat the experiment. Some cannot get enough materials and want to repeat an experiment. Ginger is patient and doesn't reprimand them. Rather, she lets them finish and gives them extra time complete an experiment. She believes strongly that many students are unfamiliar with equipment and need to develop experiment skills. If she gives them more time to practice, they will improve. She remembers how understanding her instructors were with her when she was an undergraduate and that it was their commitment to her learning that kept her in science.

One day, she walked into the TA room in the middle of a student-bashing session in which her TA compatriots were complaining about how little their students knew and how it was a waste of time to spend extra time with students who weren't interested in science in the first place. When she tried to argue otherwise, she was called an idealist and told that she would end up wasting all of her time on lost causes that would jeopardize her graduate career.

### **Confront or Not?**

Part of Sally's job as a Biology TA was to make up short lab quizzes on certain weeks throughout the semester that were worth only two points, and give them to her students at the start of lab. One week, she was preparing to hand out the first lab quiz of the semester and asked that the students put their notes and books away. While the students were all taking the quiz, Sally walked around the lab checking to make sure everyone was doing their own work. However, when she got near the far side of the room, she noticed one student was casually looking at something on his cell phone in the

corner, while another seemed to be hiding what looked like a page of the lab manual under the lab bench and was occasionally glancing at it. She wasn't sure how to confront the students. What if they weren't cheating and then she embarrassed in front of the whole class?

### Consulting a Higher Authority

Grading lab reports took a lot of time and Allison had finished about half of the ones she needed to grade when she thought to herself-*déjà vu*-I've seen this before. Sure enough looking back through her stack of graded reports she found another report that had the same graphs, same fonts, and identical typographical errors. She crossed out the "B" and replaced it with an "F" and put an "F" on the paper she was grading.

In lab the following day, two sophomore organic chemistry students were quite upset with their failing grades. Allison said, "What did you expect? You know plagiarism is unacceptable." One student responded, "But we have shared our work all semester, and you never said anything on our lab reports." Allison couldn't believe they said that and responded, "Then I guess I should fail you for the whole semester since this is not an isolated case."

The rest of the semester proceeded without incident until her supervising professor called her in after hearing about the incident. "This is not a situation that TAs are supposed to handle on their own. Why didn't you report this to me, at least, and the Office of Student Conduct?"

### Contact Discomfort

Natalie frequently receives e-mails from her students with questions regarding pre-lab assignments. If the answer is quick and easy, she responds to their questions via e-mail; otherwise, she advises them to stop by during office hours for a more detailed discussion. One student, Mason, e-mails her every week asking for help or clarification and while she tries to answer his questions and explain the assignments, it sometimes gets out of hand (one weekend, he sent her a total of 17 e-mails!).

That same student frequently has to do make-up labs and will find Natalie to give her long-winded explanations as to why he couldn't make it to her lab. One day, she was handing back graded assignments and before he even looked at his grade, he began to panic and explain that he didn't have time to finish the experiment for that report (which was made up in a different TA's lab) and that he doesn't want to fail the course. Natalie attempted to calm him down and said, "A lot of people weren't able to finish that experiment in several lab sections so I did not deduct points if there were missing answers." Mason broke into a smile and said "Thank you! Thank you, you're the best!" and without warning, hugged her. Taken by surprise and not knowing how to react, Natalie stiffened up and awkwardly patted his arm. She knew that this move was not romantically-motivated but she still felt uncomfortable being hugged by a student, especially in front of other students who had no context for the hug.

### Copy Cat

Ann is a TA for CHEM-101 lab. She noticed that two of her students, Amanda and Bob, have exactly the same data for a lab they were supposed to do individually.

Ann had thought that everyone was doing his or her own work. But it's possible that they could have shared data without her knowing. Ann decides to confront the students about the identical data.

At lab, Ann asks Bob and Amanda why they have exactly the same data.

Bob says, "We didn't copy."

Ann responds, "But how could you have exactly the same data?"

"We're doing the same experiment, we should have the same numbers."

"Yes, that's possible, but it's not likely to the third decimal place. Everyone weighs out solids differently. Are you sure that you did all your measurements individually?"

They respond, "Yes."

### Credit for Missing Data

Tom was grading chemistry lab reports late one night when he found one that was missing the entire Results section. So he wrote on the front page of the report, "Incomplete, please see me." However, after two weeks, no one had picked up the report so he gave it a "D" that reflected the incomplete report. Just before the final exam, the two students, Susan and Lili, who wrote that report, came to Tom complaining about the low grade.

"We submitted the whole report" Susan said, "And it was complete."

"We are very sure about it." Lili affirmed.

Tom replied, "That may be true, but I did not get the complete report." He took out the lab report and said, "Look here, is this your report?"

"Yes, that is our report. But we had a calculation part here.....En? Where is it now?," Susan asked.

"That was my question in the first place," said Tom. "If you had picked up your report when you were supposed to, we could have settled this problem long ago."

Susan said, "OK. Here is our original copy. It is complete, on this disk."

But Tom refused the disk. "No, that is not the point. I asked you to come to me weeks ago. You did not review your lab report until now. It is too late."

"That's not fair," they answered, "Please give our deducted credit back, because we really did the work."

"But you did not submit the report on time," Tom reiterated.

A teary-eyed Lili pleaded, "We don't know what happened to that report. Can't you see we have a complete report on this disk? Maybe someone removed that part after we turned it in. It is not our fault. Please give us the grade we deserve. Why are you being so difficult?"

### Crocodile Tears

Cathy does not show up regularly for Rob's lab course. When she shows up, she is often late. One day Rob assigned a report due in one month. He gave different students different topics. That day Cathy was absent from lab and she was absent for the whole week just before the due date. Rob asked other students about Cathy. Someone thought that she went on vacation with her parents. Rob in disbelief exclaimed, "Seriously!!! In the middle of the semester!!!" She did not even send him an email that she would be absent.

After the due date, Cathy came to Rob's desk in the TA office and told him that she was absent because her mother was sick and she had to take her to hospital for treatment. She asked Rob to accept her assignment. But Rob unsympathetically replied, "I am sorry. It's too late now. You did not send me an email about your absence. I cannot help you." Tears welled up in Cathy's eyes, "Please, accept my assignment."

### Crushed Dreams

There was one student in Jenn's Wednesday lab who always seemed to be the last one done. No matter how tactful she was, there was no way in trying to get Lydia out on time. However, Jenn had a lot of patience. She realized these students did not have a strong chemistry background. Lydia really wanted to do well in chemistry, although science was never her strongest subject. Jenn was aware of this and scheduled extra time to meet with Lydia to go over the lab material each week. This seemed to work, as Lydia's lab grades improved and she excelled on the first two exams. Jenn also started to build more confidence in herself as a TA. She had always dreamt about becoming a professor and seeing one of her students improve made her feel like this dream could become a reality.

Halfway through the semester, Lydia stopped coming to their weekly meetings. Jenn e-mailed her and asked her why she didn't show; however, she did not get a response. In the next lab, Jenn had meant to ask Lydia why she missed their meeting, but instead of being the last person out of lab, Lydia was one of the first to leave. While grading the labs, Jenn saw that Lydia's pre-lab answers were completely incorrect and her data and post-lab questions were incomplete.

The next week, Jenn went up to Lydia and confronted her about her poor lab work and their missed meeting. Lydia said, "Oh yeah, I decided that I don't need your help anymore. Thanks anyway." However, Jenn thought differently. Again, after Jenn finished grading the labs, Lydia ended up with the lowest score. The next lab, Jenn asked Lydia, "Are you sure you don't need any help? I really don't mind – maybe we can go through the material before your next exam." Before Jenn could finish speaking, Lydia snapped back, "I said I don't need your help anymore! Lay off. Do you think I'm stupid or something?" in front of the whole lab. Jenn wasn't prepared for such an invective. She burst into tears and left the lab while her students stood there not knowing what to do next. Jenn felt like the real failure now.

### **Crying Student**

Few opportunities arise when you can help others when they really need you. Madeline was Petra's TA. Petra came to class on time and paid attention to Madeline's lectures and instructions. One day finishing up the class on how to calculate the concentrations of the various solutions, Madeline asked her students to practice some more. Petra raised her hand. She asked Madeline to explain the calculations again and then started crying. Madeline could not understand what upset Petra. All she could do was try to calm her down. Somehow Petra misinterpreted the attempt to console as an insult and said derogatory things about Madeline's ability to teach. Madeline did not become defensive but stood by Petra until she calmed down and realized that Madeline was sincerely trying to help her. At the end of the lab, Petra apologized and thanked Madeline for her help.

### **Cultural Differences**

Last week, Jing, a teaching assistant from China, got an email message from Jane, one of his students. She wrote, "This Wednesday I have a basketball game that I have to cheer for. Therefore, I guess I have to go into a different a lab. Can you please write back as to which lab you would like me to attend this week." Jing didn't know how to respond, because the lab this week was an investigative lab (the experiments are designed by student themselves) and the materials prepared for other labs might be different. Moreover, in China, "cheering for a basketball game" can not be an excuse for changing labs. However, he understood that, maybe, the game is really important to Jane. Maybe, her brother or her boy friend will play for their university on Wednesday. Jing couldn't decide whether he should allow Jane change the lab or not. And he also wondered whether this were a difference between American and Chinese cultures.

### **Cutting Corners Makes Sharp Edges**

Tom was teaching a rather lengthy plant lab this week which involved measuring transpiration with a potometer and preparing and observing monocot and dicot cross sections under a microscope. He also had to meet with his molecular biology class shortly after the normal end of lab to prepare for a presentation. In an effort to move things along efficiently, Tom helped each group set up their potometer the correct way the first time. The potometer setup is tricky and most of Tom's energy went into preventing problems with them rather than other parts like the slide mounts and cleanup. While lab went quite smoothly, the cleanup didn't and many of the students escaped before cleanup could be completed properly—gloves ended up in normal trash, plant parts were everywhere, and the slides were not all cleaned or disposed of properly. As Tom rushed to clean the lab on time and meet his group, he saw that the sink was clogged with floating plant parts. In a fit of anger, Tom reached into the murky sink without gloves to remove the plant bits clogging the drain. A sharp pain ran up his hand. He now had a decent sized gash in his finger. It turned out that a cover slip was nestled against the drain cover and it was shattered in several pieces presenting sharp edges to unwary hands. Out of time, Tom has a bleeding finger, some minor blood spots, a dirty sink, and a half cleaned lab to deal with.

## Cyber Impact

It was a gloomy, rainy day. There were whispers and discussions all around Rosie's laboratory—" 2.456, 6.267, 9.789...." She was surprised by these numbers when she walked around the lab. She noticed that a couple of students had used their Smart Phone to copy data from students in another section. She asked them, "What are you doing?" One of the students responded, "We are doing our experiment!" Then she asked, "Then why are you looking at the other student's data?" Their response, "We are just looking at what they are doing, like how they solved this question." Annoyed, she reprimanded them. "Stop copying the data from other section. That includes the post lab questions." The student still tried to argue: "We did not copy the data from others, we were going to ask you, but you do not know how to answer it!" This comment puzzled Rosie because these students never asked her questions, so how could they know she couldn't answer it? "If you only copy the data and answers from other section students, you cannot learn anything, when you have exams you will fail them and the course."

Rosie was still very angry after lab as she walked through the long hallway in front of the professor's office, wondering whether she should stop and report the incident.

## Dead Silence

Si Lantz, a first year TA, has two chemistry lab sections of mostly non-major upperclassmen. Despite the tedious nature of the experiment, his session on Monday went well. The students were lively, engaged, and worked together. The students in his Wednesday section seemed more reserved but managed to finish on time. In the second week, the Wednesday section was completely silent. During his introductory presentation, Si asked, "What questions do you have?", just like he learned in TA class. It worked wonders on Monday, but his Wednesday section seems full of zombies--no questions, no raised hands, no curiosity. Later, a student stares back and forth between the operating instructions and an instrument for an hour without asking for help. Si sees a student who has finished using the balance but remains there to do some calculations. Standing nearby, waiting quietly to use the balance, is another student, who is reluctant to butt in. "Hey Dan, why don't you ask Jerry if he's done yet?" Dan just shrugs and says nothing. Si cannot even assign prelab grades because his students refuse to participate, Si would like to give quizzes to get at least a written response, but that is not part of his responsibility. "Why don't you make talking part of their participation grade?" asks his fellow TA Chad. Dead silence for three hours makes for a long day and Si fears his students are not getting anything out of lab.

## Deadbeat Lab Partner

Amy was a TA for an Introductory Biology lab that had only 12 students. On the first day of lab, Amy let her students to choose lab partners. She could tell most of them selected partner they already knew. However, as always, there were a few students left over and who were paired up randomly. Six weeks went by with no major issues. Then, after one lab, Amy got an e-mail message from one of her students asking to meet with her. She met the next day with her frustrated student who told Amy that her lab partner just came to lab, sat down, let her do the whole experiment, and then copied the results.

The student apologized for complaining and recognized that although she felt it was unfair, she didn't want to make everyone in the lab switch their partners.

### **Deadlines**

Mary is a first-year graduate student, who is the TA for Inorganic Chemistry lab instructed by Dr. King. Dr. King gives homework assignments every two weeks always with a deadline of Monday at 4:00 pm. Mary takes responsibility for collecting the students' homework, grading it, and recording the grades.

However, Mary has a problem. Although the students have two weeks to finish their homework, several students can not hand in their homework on time. Each one asks Mary for one or two days extension and has an excuse such as, "I took a test last Friday and I had to study full time for it," "I have a paper due tomorrow, so I have no time to finish my homework," or "I had an important Basketball game yesterday that I couldn't miss."

At the beginning, Mary agreed to give extensions without a grade penalty. But as time went on, some students who always handed in their homework on time complained to Dr. King about this. They argued, "Everyone has lots of choices to make. It is a question of time management. The deadline is a rule. If they can not abide by the rule, they should suffer the consequences. It is unfair to give late homework the same score as those that are on time. If everyone can ask for an extension, the deadline is meaningless." Dr. King asked. "Have you talked to Mary about this?"

### **Dealing with Disorganization**

Rose, a non-science major in General Chemistry lab, showed very little interest in the lab. Every time John, her TA, graded her lab reports, he found at least one page missing. At first, because the reports were not stapled, he thought maybe he had lost the page and even apologized when he returned the first report. But it happened again and again. The pages were out of order and once there was a page from another class handed in. On the fourth week when he returned her report, he asked her, "Rose, did you hand in everything? I can't find one of your pages." She replied confidently, "I handed in everything." John didn't believe her. Finally, John changed his approach. When Rose handed in her sixth assignment, he checked her untidy sheaf of paper. One page was upside down and he couldn't find one of the required pages. He asked her, "Rose, did you hand in everything? I can't find one of your pages." She rummaged through a pile of papers in her backpack said, "Gee. Is this what you want?"

### **Dealing with Uncertainty**

Understanding the nature of science was the goal of Allison's first biology lab. It was going to be a challenge for students who were not science majors to understand and appreciate what scientists do and how they think. Allison separated her students into groups and each group was given an envelope containing written checks. They were asked to analyze the checks and come up with a hypothesis as to why these checks were

written. The students worked well in their groups and the activity led to a great class discussion. The activity was meant to demonstrate how scientists use evidence that they have to form hypotheses and ask new questions. At the end of the discussion, however, a student asked Allison why the checks really were written. Allison said, "I don't know. Besides that is not the point of the activity. Scientists don't always know all the answers, but they continue to ask questions and do research to try to find the answers." Many in the class seemed to understand this, but a few students were exasperated, one of whom said, "I don't know how scientists could do it. I could never be a scientist. That's dumb, scientists should know all the answers."

### **Dear Abby**

Abby always took the time to get to know the students in her on a personal level. Because she was so empathetic to her students, many times she would be approached with problems that were outside of lab. One day in lab, Abby noticed that Sally, a bright and motivated student who had plans to go to graduate school, was crying. Abby soon learned, "My boyfriend broke up with me. I don't know how I can manage without him."

Abby consoled Sally. "Don't worry you're going to do just fine without him. You're one of the best students here. You don't need a boyfriend to make it through grad school, I don't have one". This seemed to console Sally and she made it through the rest of the class.

Sally told her friends about how nice Abby was to her wanted to show her appreciation. Someone as nice as Abby shouldn't be alone, she thought, and came up decided to make Abby an online dating profile so she could find the boyfriend she deserved. Sally used the email Abby had provided them and began trying to set her up.

Abby very quickly had her inbox flooded by men from the dating site and an email from Sally explaining why, "No need to thank me!", she said. In the TA lounge, Abby vented to her colleagues, "Why would I thank her? Hundreds of strangers now have my personal information! Why would she get herself involved in my personal life?"

### **Death by PowerPoint**

At the beginning of every lab section, Fred had to give a pre-lab lecture based on some premade PowerPoint slides. He suspected the slides were boring to the students and believed that was why few of the students paid much attention. They just wanted to get the lab started and get out as fast as they could. Although the slides might be boring, Fred realized that they brought up important information about what was about to happen in the lab.

As the semester progressed, Fred's Wednesday night section paid less and less attention. The lab was from 7-10 pm and the students were always tired and really did not want to be there. It got to the point where the students would start gathering their supplies and setting up their apparatus' during the pre-lab lecture. It became difficult for Fred to talk over the students. The lack of attention was even more apparent when students would ask questions that had been clearly addressed during the pre-lab lecture.

The whole idea of the pre-lab lecture was to have the students understand and make the lab more efficient.

### **Delayed Response**

Jack showed up on time every week for his intro chemistry lab and finished his experiments with his partner with no problem. But his TA, Ping, noticed that Jack always handed in his pre-lab and MSDS sections stapled to his lab report and post-lab when he left the lab room at the end of the period. As Ping had said at the beginning of the semester that the pre-lab and MSDS must be handed in at the beginning of the lab period. He wrote an email to remind Jack about this policy. However the same thing happened again. All the other students handed in their pre-lab and MSDS sections when they arrived for lab. Ping stressed the rule to Jack again, but it didn't work so he tried a different approach. Jack found that he only got half credit for his next report even though all his answers were right.

Jack felt upset and came to argue with Ping during the office hours. He told Ping that the grade was unfair because other TAs were not so strict. Ping replied that this rule was set up by the professor and he could not change it. Ping suspected that Jack did not complete his reports in time, but finished them during the lab, which was forbidden. Jack insisted that he finished them before the lab, but needed to discuss some problems in those sections with other students during the lab, and that was the main reason why he handed in them later.

### **Dependent Student**

Generally, Caroline's students worked well together and asked directed questions when they were confused. However, one student, Joe, incessantly asked questions that somehow bothered Caroline. Joe did not focus on concepts. Rather he sought individual answers to piece together a comprehensive, 'correct' lab report. His learning strategy collided with the last lab of the semester. It required formulating a procedure from past concepts, rather than following detailed instruction as in previous labs. Caroline was proud of the progress of her students and thought they would successfully complete and enjoy the different kind of lab because it would give them some freedom to show what they know and be a bit creative.

After the prelab lecture, the majority of the students quickly began discussing their respective procedures and checking them with Caroline. By contrast, Joe sat with his apathetic lab partner, Sarah, for about 15 minutes before approaching Caroline to ask, "Uhhh, what are we supposed to do?" She helped them think through the first step.

The lab proved to be more difficult than expected for the class and Caroline was entirely occupied by different questions and troubleshooting. Joe and Sarah insisted on waiting to ask Caroline about each step before proceeding. The lab went over the allotted time for each group, but Joe and Sarah had not yet finished the first portion of the lab. Joe came up to Caroline and asked, "I'm sorry, but what are we trying to do?"

### **Different Priorities**

Jennifer came back to the TA office fuming after she finished her lab, the lab before the mid-term exam. Kara, a student in her lab, kept studying for the exam by looking at her notes and textbook the whole time. She paid no attention when Jennifer was showing the class how to set up the titration device for that lab. “I should have just thrown her out of the lab”, Jennifer said for anyone within earshot.

Jennifer had asked Kara to join a group to finish the lab, however she refused. “Do you know how to write the ionic equation?” Jennifer asked. “No, Don’t bug me. I have to study for the test this afternoon. The mid-term means a whole lot more to my grade than this dumb old lab.” Jennifer became really angry, “I understand the test is important to you, but you should finish the lab first. It is a good way for you to understand the lecture material. If you don’t, you might as well go somewhere else to study and I can mark you absent.”

### **Dilution Delusion**

Week before Thanksgiving, the lab final exam was administered. Prof. Jones met with her TA's as they graded parts of the exam that were not multiple choice questions. The following day, as she was reviewing grading of the exams, she discovered that the question on serial dilutions was incorrectly graded by one of the TAs who marked answers that were actually correct as wrong and few that were incorrect as correct. This prompted her to review all of the exams. Much to her dismay, she discovered that another TA had made a similar mistake. Fortunately, she thought, “I caught the problem before the exams were returned to the students.” However, she still had reason to be concerned.

Considering that her TA's were not given an answer sheet, she was able to gain insight into their way of thinking. They had calculated the answers themselves—but they were wrong! The success rate among students on that question was dismal. Out of 84 students who took the exam, only 2 answered question on serial dilutions correctly. Even in a group of 12 honors students, only one person got that question right.

### **Disappointed TA**

Denise was a TA for an Organic Chemistry Laboratory. For the post-lab work, students were required to do a ChemDraw assignment every week. Everything was going on very well until the last week. For the last week post-lab work, one of her students emailed his ChemDraw assignment to Denise and in the file another student’s name was written. Denise was really surprised and disappointed because this student was one of the best students in the class. He was always prepared for the laboratory and interested with the subject. She asked her student: “You know that plagiarism is not acceptable. Why did you do that?” and student answered “I am really sorry. I have lots of exams this week and I could not have time to do the assignment, but please do not tell the professor and do not give the zero for the assignment. My grades are really important for me. But, doesn’t plagiarism apply only to written work?”

### Disney Favorites

Professor Albias teaches two general chemistry classes: an accelerated general chemistry course and the normal first semester general chemistry course. The accelerated general chemistry course has a separate laboratory section, and the regular first semester general chemistry course is split into two lab sections. Harmony, one of Professor Albias's advisees, is the TA for all three lab sections.

Professor Albias has an agreement with the University that all graded assignments must be turned in using student aliases because of previous accusations of unfair grading. Students are not aware of this agreement, but Professor Albias explained the agreement to Harmony when she became his TA. Harmony would be not responsible for grading any work, but she would be responsible for recording students' aliases; all grading was to be done by Professor Albias.

The regular general chemistry course started the semester according to the agreement; all students submitted assignments under names such as Minnie Mouse and Winnie the Pooh. However, aliases were not used at all in Professor Albias' accelerated general chemistry course. By the middle of the semester no students were submitting work under alias names, and as the end of the semester approached a few students started declaring unfair grading. Word spread, and the accelerated general chemistry students started to think they were victims of unfair grading the entire semester.

### Disparate Lab Courses

Sam teaches two different labs. One lab (G001) is highly organized with the professor conducting weekly TA meetings and going over issues and feedback from the TA. The instruments and materials are maintained and are all in working conditions. The lab manual is also well-organized with thoughtful and well formulated questions and a detailed rubric. Sam's lab section is later in the week so he feels prepared when he walks into the lab and finds the laboratory session productive.

However, the second lab (B666) has no weekly TA meetings and the experiments are very old and need revisions. The lab manual is falling apart and has vague and sometimes inaccurate instructions. The person in charge of this lab is no longer working in the school and the prep person is a new graduate student. The only instruction Sam received about the lab from the professor is to go easy and "give everyone basically an A". Sam consults the other TA Jake who has been instructing this lab for 6 semesters. Jake understands Sam's problem but only replies, "It's just the way it is." Sam also emails the professor about the issue in the labs but does not get a straightforward response.

During every lab session, Sam encounters numerous problems during the course of the experiments and the students become confused and start complaining. Sam identifies with the students and tries his best to conduct a productive lab session. The atmosphere in the lab is stressful for everyone and the students blame Sam for the problems.

### Do We Really Need to Understand This?

In order for students to work on the limited number of instruments, six lab experiments, such as freezing point depression of electrolyte solutions and partial molar volume, operate simultaneously each week in Peter's P-Chem lab. Students rotate through them in a different order. These experiments were new and so difficult for Peter that he had no idea what to do when he read the directions the first time. "If I can't do understand these experiments, how can the students understand them and get anything out of them?," he thought.

One day Smitty and Mike, two of his students, had an unexpected problem when they were determining the vapor pressure of a pure liquid. They added a lot of ice into the water bath to cool the cyclohexane. The temperature dropped so rapidly that they couldn't make the liquid in the U-tube equal. As a result they saw many bubbles going to the isoteniscope. That meant the pressure they recorded wasn't the vapor pressure of the cyclohexane because it included the pressure of air. But they went ahead. Peter saw it and told them to stop the experiment.

"Why? Does it matter?" Mike asked. With Peter's full explanation, they stopped the experiment reluctantly. Afterwards, Peter asked Smitty, "Did you prepare for this experiment?" "Of course," he responded. "I read the directions carefully, but I have no idea about what it means. I just want to know how to do it correctly and fast." Peter volunteered, "This is a required lab for me, but I'll never need this except to get through this course. My dad said he never had to use what he had in P-Chem. You're a chemistry grad student and I'll bet this is stuff you'll never use except to teach this lab. Right?"

### Doctor's Note

Samantha was a teaching assistant for the recitation section of a non-majors general chemistry course. Her responsibility was to help the students in understanding concepts and distributing quizzes to test the students on their knowledge of the week's material. All quizzes in the class accounted for one-third of the final grade, and no excused absences were given to students without the teacher's consent.

Half way through the semester, Samantha noticed that Amanda had missed three of the five quizzes in the class and, on the quizzes she did take, she scored a below the average. For reasons unknown to her, Amanda's absences were excused by the professor, so her quizzes were not counted as zeroes in her final grade. It was the sixth week, and Amanda didn't come to recitation, and Samantha knew she was missing. After everyone had finished the quiz and handed it in to Samantha, Amanda appeared and handed over a doctor's note from last week's missed quiz.

"Here you go Samantha," said Amanda "My doctor's note for last week's quiz."

"Thanks Amanda," Samantha said, "But why didn't you take today's quiz?"

"Well, um, I really don't understand this stuff, so I figured not coming to recitation to take this week's quiz was better than taking it at all and getting a zero."

### **Dormez vous?**

Mary really enjoyed being a TA, although she did not like the pressure of having an 8am lab each week. She diligently made sure to arrive early to prep the lab and tried to be enthusiastic to keep her students engaged no matter how tired she may have been. One week during the microscopy, one of her students, Daniel was sleep. "Have you finished everything Daniel?" Mary asked. "Yes," he replied. "I'm waiting for everyone else to put their data on the board." Mary let him go back to sleep and did not think much of it realizing he and a few students finished the lab quickly. It was an individual lab and those with experience using a microscope finished early while many other students still had a lot more to do, but they all needed each other's data for their results section.

The next week Mary noticed Daniel was sleep again during her lab introduction. Though she was slightly annoyed, she did not know if it was a good idea to stop teaching to tell him to wake up, so she continued teaching. Later the same lab Daniel was sleep again while the students waited for their red blood cells to lyse. Frustrated at this point, Mary told Daniel's lab partner Samantha, "You need to keep him awake so that you both are working together. Furthermore, it is not safe to be sleep in lab." Several more times that day, Mary had to wake up Daniel.

### **Dormez-vous**

Sento was an international graduate student who was offered the TA position to teach two sections of a biology lab. Prior to the beginning of her TA adventure, she attended several sessions that dealt with the University's "Do's and Don'ts in Teaching", They emphasized a "one size fit all policy". At the end of that training course, she felt she was ready to meet her students and have a smooth semester. Part way through the semester, she received the following e-mail message from one of her students:

*Dear Sento,*

*I am very upset to be in this position, but as you know, I missed today's biology lab. Grades and my schoolwork are incredibly important to me and I have had several exams the past two days. Because of this, I spent the past two nights studying. While staying awake for over 48 hours straight was probably not the best idea, I did what I thought I needed to do.*

*Unfortunately, my lack of sleep caused me to miss lab tonight. Earlier this afternoon, I took a nap to catch up on sleep and set the alarm for 4:30, leaving me plenty of time to wake up and prepare for lab at 6:00. By mistake, I set the alarm for 4:30AM and woke up at 7:45PM long after lab had started. When I realized my mistake, I was horrified considering the importance of each individual lab and its significance to my lab grade.*

*I know that missing laboratory was my fault, and if nothing can be done, I understand. However, if there is anything at all that I can do to redeem myself and salvage my grade from this lab, it would be appreciated greatly. I am willing to do whatever it takes to still be able to complete the experiment and write the lab report for next week's meeting. I am sorry again for the inconvenience and hope that you see how important this is to me.*

*Thank you in advance,*

*James*

### **Down Time**

At the beginning of the semester, Efo, an international TA, explained all the lab policies as included in the booklet for proper lab conduct. For the fermentation lab about halfway through the semester, students measured the rate of carbon dioxide production with various substrates. This involved watching the fermentation chambers for 50 minutes and monitoring the rates of fermentation at intervals of time. Bridget, a student in the lab, had her cell phone on the table, didn't have her goggles on, and was reading a PSAT booklet, when Efo approached her and asked what she was reading. She answered, "A book to help my friend pass an exam." She added that she didn't have anything to do for the 50 minutes and decided to study something else. Efo, trying to give her a different perspective asked, "What would you do if this was your class and a student was doing something else besides class work. How would you handle it." Bridget seemed unperturbed and said, "I am a free-spirited person. I don't see that students need to waste time watching bubbles form." Efo asked her to put her books and cell phone away, put her goggles on, and take some measurements.

### **Dressing for the Occasion**

During Orientation, new TAs learned how important it was to enforce lab safety rules. Steve knew that if he didn't enforce these rules, he could be relieved of his TA duties. In the second week of the semester, he was tested on how strictly he would follow regulations. Jason, one of his students, arrived in shorts on a hot day having forgotten about the lab attire rules. When Steve confronted Jason and told him he would have leave and come back wearing long pants, Jason said he was a commuting student and he lived too far away to go home and get changed. Steve replied, "Sorry, you will have to take a zero or make up the lab some other time."

Jason's solution was different. Hearing his dilemma, Sue offered Jason a spare pair of chinos she had in her backpack. She had worn them in a theater class earlier in the day. They were very tight, but Jason squeezed into them and triumphantly entered the lab. Steve didn't know whether to laugh, ignore, or find the solution unacceptable.

### **Drop the Missing Assignment!**

The fall semester of BISC 207 course had a total of 11 writing assignments dealing with different sections of a lab report. At the end of the semester, the lowest grade for one of the assignments was to be dropped so that grades for only 10 assignments were to be taken into account. Each week, the students were to be given one or two writing assignments pertaining to that week's lab experiment. Betty, the TA made the students aware of this while explaining the syllabus and the grading policy in the first lab period.

Towards the end of the semester, while collecting the last assignment, Betty realized that Jason had not turned in his assignment. When she asked him about the assignment, he replied, "I didn't do the assignment. You said that the grade for one of the

assignment will be dropped, didn't you?" Betty replied, "That is true. However, I said only the "lowest" grade will be dropped, not a 'non-existent' one! Furthermore, this assignment particular lab is an important one." Jason protested, "I don't think I need to do the assignment if you already have 10 of my assignments with you."

### Dry Lab

Raj is a TA in General Chemistry laboratory. The experiment this time lasts for two weeks. The main tasks are getting the students to draw Lewis structures and learn how to apply them using molecular models.

Because the students had already learned about Lewis structures in lecture before the first week of lab and most of the students could finish drawing the structures of the corresponding molecules in the lab book before they came to lab the next week, Raj thought there wasn't much point in having the students come to lab to work on things they could do at home on their own time. Therefore he told all of his students in his sections that they really didn't need to come to lab next week. Instead he would hold office hours for anyone who wanted to come by. They could use the time to prepare for the approaching midterm examination.

Two days after he cancelled lab, he received a forwarded e-mail from the professor of the course who was quite angry. The original e-mail was from a student in another section asking the professor for permission to skip lab and just turn in the lab report the way Raj's section was doing. The Professor told Raj that he did not have the authority to cancel a lab without asking and made it clear in no uncertain terms that he could lose his assistantship if he did anything like this again.

### Early Dismissal

Ashley had taught the acid-base titration lab before and knew that it would take the full lab period. Things were pretty much on schedule, but she had to make sure nobody was falling behind because there was still a lot to do. Much to her surprise, Tony, the TA from the next lab poked his head in and said, "Hey, check out Paula's lab, they're already finished!"

Ashley couldn't believe it, but indeed it was true. She couldn't understand how that was possible. Tony reported that one of the students from Paula's section had stopped by to see her friend in his section. The student said that Paula had told her students to skip over entire sections to finish quickly. Ashley became angry. "This is not fair to your students and my students who have to complete the whole lab. It is a disservice to Paula's own students who are supposed to be learning this stuff and will be expected to know it. And it is an injustice to all the other TAs who stayed and completed the entire lab."

Tony had heard that this had happened in other sections as well, not just in Paula's. He wasn't sure though. "How would anybody know? I'll bet the professor doesn't know. There are just too many sections to keep track of. ...I'm not going to be a tattle tale. You can tell the professor, if you want."

### Easy Answers

Ben and Gerri were taking a Starbuck break in between the intro biology labs that they TAed. “You know,” said Ben, “it is a whole lot easier just to give an answer than to try to come up with some appropriate probing question whenever a student asks a question. My impulse is just to answer the question and get on with the lab. Whenever I do respond with questions that make students think and might lead them to an answer, they get frustrated, and I do too.”

Gerri agreed, “I know what you mean. Just last week one guy in my lab got angry when I asked him what assumptions he had made. He sort of flipped out in front of the whole class and asked, ‘What good are you if you can’t answer my question? I’m beginning to wonder whether you really know the stuff yourself.’ That hurt.”

### Embarrassing Moment

Pipa is a sincere biology student taking organic chemistry. She has difficulty grasping concepts, but she works hard and does reasonably well in part because she asks lots of questions of her TA, Pradeep, during labs and during Sunday afternoon review sessions. She also comes to Friday evening sessions conducted by Pradeep. Because the sessions are not well attended by other students, Pipa at times has in essence a free private tutor.

Pipa got B<sup>+</sup> on both midterms. Before the third midterm, she sought Pradeep’s help to review and reinforce her understanding of nucleophilic substitution chemistry. As usual, despite his busy graduate school schedule, Pradeep spent 2 hours on Friday evening revising previous questions and problems from the book for the review session. Pipa was not confident in her subject and she was bit tentative. Pradeep could see from her face that she was not well prepared for the midterm on the following day, Saturday.

On Sunday at the usual review session, Pradeep asked Pipa about the exam and how she did on it. She looked perplexed and asked, to Pradeep’s surprise, “Do you have some time to review nucleophilic substitution reactions again for me?” He thought she would be curious about questions on the examination and how she performed. Because Pradeep had many deadlines in his school work, he wasn’t able to provide the extra help Pipa requested, which disappointed her.

The next day, Monday, Pradeep was proctoring the make-up exam. Much to his surprise, red-faced Pipa was taking the make-up exam.

### Every Point Counts

Tom, a freshman student had a BIO-230 lab every week. He scrutinized his graded lab reports and discussed every deducted point with Daniel, his TA. Even though Daniel would patiently give him explanations, Tom clearly felt too many points were wrongly deducted. After several of these discussions, Daniel’s patience was wearing a bit thin.

One day after all students had handed in a lab quiz, Daniel discussed the answers. When he finished, Tom asked Daniel, “Could you please return my quiz for few minutes? I mistakenly marked couple of answers wrong. I need to correct them so I won’t lose

points on this quiz”. Daniel couldn’t believe this request and refused to do so saying, “Are you kidding? I suppose you would like to grade your quiz too. Do you think you are the only student who would like to take the quiz over after I’ve given everybody the answers?”

Tom replied, “You don’t care whether your students do well or not. You are just overly strict and harsh.” For the rest of the lab period, Tom did not pay attention to lab instructions and did poorly in that particular lab.

### **Excellence in Teaching Awards**

Nancy had been a biology TA for two years now and had done a good job, at least that what the student evaluations said. She prepared for every lab. She even went the extra mile to read the educational literature to see if there were ways she could make the topics more interesting and relevant for her students. Many times she stayed after lab to help students and had attracted many students to her offices hours because they thought she was so helpful. Nancy wanted to help students learn and she never once felt she did all of this to get an excellence in teaching award.

As had become the tradition in the department, the chairperson made the annual TA teaching awards at the last departmental seminar each spring. This year, three of Nancy’s classmates got the awards. She did not. Although it flashed through Nancy’s mind that she might have deserved one of the awards, she quickly erased the thought. Only later did the thought return when her good friend and lab mate Melissa said to her, “Why didn’t you get one of the teaching awards? Frank is good, but you’re so much better than he is. You should have been nominated.”

Melissa went on, “Excellence in teaching awards seem so random. I mean, you can be the best TA in the world and never get an award. For instance, if your supervisor doesn’t take the time to write a nomination, forget it. If they do, it is hard to know what they have to go on. I never had a supervisor actually observe me in lab. Maybe they figure if they get no complaints, you’re a good TA. How do they know whether you help students learn?”

Nancy didn’t want to think about it because it made her feel guilty. On the other hand, she couldn’t stop thinking about it because she felt disillusioned.

### **Excused Absences**

It was 10:50, and Mark had just finished teaching his first lab of the day. Everything had gone well, aside from two apparently unexcused absences. As he was enjoying a break before his next lab, he noticed an unread email that had been written sometime during lab. Checking it, he found it was from Sarah, one of the missing students. She was sick, and had wanted him to know. She asked what she should do about the missed lab. Mark quickly fired back a reply, telling her that it was fine, and she should just get a doctor’s note to him sometime in the next week.

Just a few minutes after sending the message, Amy, the other absentee from lab, came into the room in tears. She explained to Mark that she had been sick the last couple days, but was feeling better. Unfortunately, she had forgotten to set her alarm clock last

night while still feeling sick, and thus hadn't woken up in time for lab. Mark asked her if she had or could get a doctor's note about the illness, and she replied that she didn't have one, and was worried that since she was already better, she probably wouldn't be able to get one.

### **Excused or Not Excused?**

In Principles of Biology laboratory, if a student misses a class, he or she is responsible to turn in the work on time no matter what the situation is unless specific permission is given. If the work is not turned in by the beginning of class there is a penalty for every day the assignment is late. One day, Steve missed a lab and did not turn in two assignments that were due. He had emailed his TA, Brenda, before class to let her know that he would miss lab because his apartment had been broken into and that he had to care of things with the police. Brenda replied telling him about the assignments and that he needed to turn them in as soon as possible, otherwise he would be penalized. The following week, Steve told Brenda: "I never got an email from you." "Here, look at my email history." He turned in his assignments one week late and would be getting a zero due to the penalty rules.

### **Expectations Dashed**

It was the evening before the second exam of the semester. Matt was conducting a review session for the students in his lab section of General Chemistry to help them prepare for the upcoming hourly exam. He felt he had done a good job helping the students review the material. It seemed like the students who came by left the session with more confidence than they had before. Margaret, in particular, asked Matt many questions, and he did his best to answer. She seemed to be getting a firmer grasp on the material as they went along, and by the end of the session she seemed ready to tackle the test. In fact, the general consensus among the students was a feeling of gratitude for the TA's help. Margaret had told Matt, "I feel much better about this test than I did a while ago." Matt knew that she was not at the top of the class, but still, he really thought that Margaret would get a better grade than she had gotten on the previous hourly.

For a couple of days after the exam, the TAs were busy grading. Matt eventually reached Margaret's exam and, with a little trepidation, began grading it. Much to his dismay, she had not done anywhere near as well as he had expected, and got a "D" —even lower than the "C-" on her first exam. Matt didn't look forward to handing back Margaret's exam in lab the next day and worried she would be just another casualty of chemistry.

### **Experimenting With Frustration**

With only two Organic labs left, Joe was looking forward to the end of the semester. His students had been having difficulties with the labs throughout the course. He attempted to prepare them before each lab by discussing the important aspects of each experiment. Regardless, it always seemed that the labs would only work for some of the students at best. Joe knew that the experiments were supposed to work, but his students were still developing their lab skills and this was generally affecting their success. There were other problems too. The lab manual was unclear in places, students occasionally

failed to follow Joe's instructions, and then there were unexpected events that he couldn't explain..

This week's labs involved the preparation of a Grignard reagent and its subsequent use in the synthesis of a dye. Joe discussed the lab with his students and stressed that it was extremely important for them to rinse their setup with dry THF, and then start the reflux to prepare the Grignard reagent as quickly as possible afterwards. As the lab progressed some of the Grignard preparation reactions did not appear to be going through the appropriate color changes, but Joe remained hopeful that the lab would work for his students. By the end of the lab however, his suspicions were confirmed. The final synthesis of the dye did not work for a single student, even the students whose initial refluxes appeared to progress correctly. "What went wrong?" he thinks to himself as he waits in frustration for the students to clean up and leave.

### **Extra Credit**

Gordon usually looked forward to teaching his labs. However, one day, his mood took a turn for the worse. He had been frustrated after teaching his afternoon lab section and just wanted to go home and rest. But he couldn't because he had to teach another section later that night. Based on the previous lab section's dismal performance, Gordon could see that the night lab would be a disaster too.

Students in this lab had a tendency to not pay attention when Gordon was giving instructions. As usual, Gordon soon found himself repeating the instructions he had given earlier. When the time came for lab to end, students were not done with their work and Gordon wanted to head home. He told them to do the second half of the assignment for extra credit and turn it in the following day.

As it turned out, only six students from that lab handed in the second half of the assignment for extra credit. The quality of their work was pretty bad. Every student in Gordon's previous two lab sections had completed the assignment for a grade, and most of them had done poorly as well. Gordon was in a bind. If he stuck by his word, two of his lab sections would receive bad grades on this assignment, while one of his sections would not be graded and would actually earn extra credit for doing the same quality of work. He thought that if he handed back graded assignments to those few students who were expecting to get extra credit, the students would feel like they were getting punished for something they thought would help their grades.

### **Facing the Music**

Dipak was an international TA who had participated in several TA conferences, seminars, and training programs. His first TA assignment was an upper-level Physical Chemistry laboratory. His TA training sessions helped him become familiar with the American culture and education system.

Things went on pretty smoothly until one day Lucy came in and checked her grade on the last report. Suddenly, she cried out, "Oh! Damn it". Dipak was shocked at her words. (Back home, a student who swore in front of a teacher would be thrown out of class.) "What's the matter?" he calmly asked. "How is it possible for me to get such a

terrible score?, she whimpered. “I stayed up all night to get it done,” and the tears began to flow. “Other TAs would never give such a low score! I know I didn’t get the expected answer, but I understood what was going on and I tried my best to explain things well. I did lots of things in that experiment. It’s as if the only thing that counts for you is the right answer. Don’t you ever read the reports and give credit for thoughtful analysis? I don’t deserve this score?”

Dipak checked the report and was about to explain his grading, but on second thought he remembered that the experiment they needed to do that day was very time-consuming and they might not be able to finish on time if they didn’t start it immediately. So Dipak told the students to get started on the experiment and said to Lucy, “I’ll have to get back to you on this later.” However, Lucy was too upset to start the experiment. Now she was angry, because she felt that Dipak had made errors in grading and was avoiding her.

### **Failing is Enough**

As a TA for a second year lecture/lab, Butch graded weekly homework assignments that were rotated through the four TAs in the course. One group of students consistently had answers in similar format to the answer key, but not quite the same. Their names were noted. On one of the final assignments, the same group of students had answers which included several paragraphs of word-for-word responses from the answer key. On the questions with verbatim responses, zero points were awarded and the students were admonished for copying from the solutions manual. The same students had failed their midterm examination with scores below 35% and seemed destined to fail the course. Butch figured that the students knew they were caught and that failing the course was sufficient punishment. Consequently, he decided it wasn’t necessary to notify his supervising professor who had declared that ANY academic dishonesty would be met with the strictest punishment possible.

### **Failure to Communicate**

Mary’s approached her first-time ever TA assignment with the determination to provide her students with the best possible lab experience that she could. She had no teaching experience in college, but she always made sure that she knew what was going on and made plans ahead of time. While preparing for the TA meeting preceding the first week’s lab, she realized that the instructions made very little sense to her and it was a lab she had never done. During the meeting, she found that she was one of two new TA’s, The other five all had taught the course before. Once the paperwork was taken care of, the group moved to the lab to actually pre-run the experiment. While trying to figure things out, Mary got annoyed. The professors only talked to each other, did things that are not a part of the lab, and generally let the TA’s figure things out for themselves. Due to the set up of the lab, Mary found it difficult to see what any of the other TA’s were doing. She left the lab, feeling very unprepared to teach her students.

That was the first week and things didn’t get any better. The lab manual confused her, so how could the students possibly make sense of it? In addition, pre-running the labs during the meetings didn’t seem to prepare her. No one took the time to

explain the purpose of the labs or discuss problems students might have and how to address them. Mary's conversations with the other first-time TA sounded like a broken record—"Do you understand what we are doing this week?" "I have no idea, its so confusing and the meetings don't really help me at all." "How are you grading the worksheets this week? We don't have an answer key, how do we make sure the grading is fair across sections?"

### **Faint of Heart**

First year graduate student, Scarlett Jones, was almost as nervous as her freshmen chemistry students on their first day of lab. The TA began with a general overview of the lab policies then began with the safety training. Unfortunately, the class had to travel to a nearby laboratory to watch the safety video because lab was not equipped with a television. As a result of another experiment being conducted in the nearby laboratory, the class had to stand at the front of the room during the 20 minute video. After the class had finished watching the video the TA rushed ahead of the class to unlock the lab for her students. Soon after a student came up to the TA, "Miss, I think one of the girls in the class just fainted in the hallway!" The TA rushed down the hall to check on her student leaving the other students in lab to patiently wait.

### **Father Professor**

Prof. Sherman of the Anthropology Department has a very bright daughter Sara who is a sophomore biology major taking CHEM-271, Organic Chemistry. Around 2:30 pm when her 1 o'clock lab got over, she stopped by her dad's office to say "hello". He was surprised to see her. "Aren't you supposed to be in lab?" he asked. She replied, "Not really. It's a three-hour lab, but we almost always are done before 3." Her dad thought that was strange and told her, "When I took chemistry in college, we had to work hard to finish organic labs in three hours. The TAs had to kick us out. What do you do in your labs?"

After a short interrogation, Prof. Sherman decided that he would investigate. He took out the course catalog and determined when another CHEM-271 lab was meeting. He didn't want to let his daughter know that as a parent he was really angry that his daughter was not getting the full benefit of the courses she was taking. The next day he hung around in the hall way outside the lab until the last student had left. It was 2:45 pm and the lab was scheduled to go until 4. As the TA walked out of the lab, Prof. Sherman asked, "Can I talk to you for a few minutes."

### **Feelings of Guilt**

Jane is a brand new TA and is still learning to cope with the undergraduate students. She teaches general Biology for two sessions. Most of her students are bright and enthusiastic and quick learners. But Dave in her second TA session seems to have problems with every aspect of the laboratory. He cannot do simple math calculations, his assignments are below average, and the lab reports are written poorly. Jane helps him through most of the experiments because he cannot finish on time and would hold up the next class. When she tries to talk to him about his class work he gives her vague answers and promises to do better next time. But Jane really sees no change in his work. She is

worried for him and is apprehensive that he will fare miserably on the test too. On the exam, he is unable to complete any of the laboratory questions and his answers are dismal. Now Jane feels guilty that if she had discussed Dave's case with the faculty member, probably he could have done a little better. Another TA tells Jane, "Get over it. It is not your fault. There is always going to be someone at the bottom of the class. You can't help everyone."

### **Finger Pointing**

For the whole semester, Carl had annoyed Bart, his TA, with wise cracks and disrespectful remarks. Carl was a senior talking his last science group requirement in a class of mostly freshmen. Bart saw Carl as the stereotypical fratboy—loud, cocky, and more interested in partying and flirting with the freshmen women in the class than studying chemistry. Carl rarely prepared for lab. More than once Carl complained, "Why do I have to take this course? It has no relevance to my business administration major." Bart often called on Carl to get his attention and to perhaps embarrass him into coming to class prepared. It didn't seem to faze Carl.

During the last lab of the semester, Carl got a purple disposable plastic glove and blew it up like a balloon. He then proceeded to bend down all of the fingers except the middle one and gleefully held it up for the rest of the class to see. A few minutes later he let the "balloon" go so that it flew across the lab bench and hit Bart in the face. Carl laughed loudly, but Bart's steely look showed he was not the least bit amused. Before Bart said anything, Carl quipped, "Hey man, liven up. This is the last lab. It's time for a little fun."

### **First Class Confusion**

John greeted his first TA assignment with excitement. After working in Dr. Mann's lab over the summer, John thought he would enjoy working for him as a TA. At the first TA meeting, John learned that Dr. Mann had not previously taught this course and that he planned to replace the old experiments with new experiments. Dr. Mann asked for the cooperation and help of the TAs. He said the experiments he planned to modify were standard ones used at other schools and that there shouldn't be many bugs to work out.

For the first few labs, Dr. Mann tried to hand out the revised lab instructions a week in advance to give the students and TAs time to look things over and get a feel for what was to be done. John felt that this was plenty of time to get things together and trouble shoot anything that might go wrong with the experiments.

As the semester progressed, Dr. Mann became increasingly busy with other obligations outside of the class. He would not hand out the lab to John and the other TAs until the first day of lab for the week. This sometimes left John and the other TAs with only a few hours to prepare for the lab. Similarly, the students did not have the chance to see the lab until they arrived in class.

As the weeks went on, John grew increasingly frustrated having to deal with problems on the fly and not know what disaster might happen the next week. However, he was reluctant to directly confront Dr. Mann because he felt it was improper to criticize a professor.

### **First Impression**

It was the first day of Joan's teaching assistant class and she was busy preparing what she would first say to her students during the first day of class. Being an international student, Joan had gone through four weeks of TA training over the summer at the English Language Institute to help her get acquainted with the mode of teaching expected at the university and how to interact with students in the lab setting. Joan wanted to make a good first impression to both her students and the instructor.

Two hours prior to her scheduled lab session, Joan sat in the library drafting what she was going to say to the students when she first meets them. She was too engrossed in trying to make sure that everything she was going to say was perfect that she lost track of time. She was convinced that her class was starting at a particular time, but one last look at her schedule proved otherwise. She was already 10 minutes late for her class. She rushed to the lab only to find the instructor waiting impatiently for her in the hallway. The students were already in the lab chatting. Joan fumbled through her back pack looking for her notes when she realized that she forgot them in the library in the haste to get to lab. Joan apologized for her tardiness but stressed to the students to always come to class on time.

### **Flame Test**

Devlin was teaching chemistry lab dealing with metal cations. Specifically, this lab utilized a Bunsen burner to perform a flame test on different metal cations. Each metal cation could be identified by the distinctive color in the flame. Sodium was bright yellow, Strontium crimson, and so on. This was a phenomenon experienced every Fourth of July in fireworks.

After checking each group's experimental set up, one student asked Devlin, "Could you help explain the post lab questions to me?" Devlin answered, "Sure, what specific questions on the post lab do you have?" While Devlin and the student were discussing the post-lab question, Devlin smelled smoke. At the far end of the laboratory, he saw black smoke rapidly rising in the corner, and heard a shriek from one of his students. Devlin quickly ran over to the smoke-filled corner of the lab, and realized the tubing connecting the Bunsen burner to the gas outlet was on fire. The lab was beginning to fill up with smoke. Students didn't know what to do, and the gas-outlet continued to pump out gas to feed the fire.

### **Following the Schedule**

When the lab schedules were handed out at the beginning of the semester, Lilly, a first-year graduate student, found out that she would be teaching a non-traditional introductory biology lab. The students actually attended a branch campus that didn't have lab facilities. Every Saturday they traveled to the main campus to take lab.

Dr. Spacey, the lecture professor from the other campus, met with Lilly at the beginning of the semester and told her that she should follow the same schedule as that at the main campus. If she had any questions, she should e-mail him. For the first few weeks of the semester, Lilly e-mailed him to keep him updated on how the lab was going. Within a week or two, he stopped responding to her e-mails, so she stopped sending him

messages.

Towards the end of the semester, Lilly noticed that her students had been given a different lab schedule than that of the regular biology labs. Since Dr. Spacey had told her to follow the regular schedule, she followed his directions and made a number of changes, including experiments and canceling a week of lab as per the schedule given to her by the lab staff. The day before the canceled lab, Lilly attended the lab TA meeting as usual. When talking to the lab staff, they asked her if she were ready for her lab the next day. She said that she had not prepared for the lab because there was no lab listed on the schedule. The lab staff then told her that Dr. Spacey had e-mailed them and had asked them to prep a lab for the following day.

### **Food in the Lab**

Derek was an experienced TA who prepared well for each lab. However, he wasn't expecting an inspection from the Occupational Health and Safety Committee. They came unannounced and immediately checked to see if everyone were dressed appropriately and wearing safety glasses. Within half a minute, one of them pulled an empty Coke can and a half-eaten Whopper in a Burger King bag out of the trash can and confronted him about permitting food in the lab.

### **Four Minus Two Equals What?**

Felix, an international TA, was getting annoyed at how terrible American students were at math. They couldn't even do simple algebra. Back home they would never make it to college. How was he going to deal with the barrage of "grade-school" questions from students adjusting to college life. Felix's frustration was starting to show. "I can't keep answering these trivial questions," he thought, "There will be no end to questions. There will be no point to the labs, if they can't figure out things for themselves." So on that day, he announced that he wouldn't answer any questions that come directly from the report sheet in the lab manual.

Sara, one of the worst offenders, continued asking everything from Felix, even the simplest questions. Felix refused to answer. "Putting numbers in a calculator isn't as important as understanding the topic. You'll have to start figuring out some things for yourself," he told her. Sara didn't seem interested in chemistry. She just wanted Felix to give her the right answers so she could turn her work in and pass the course. Felix tried many different ways to get Sara to figure things out for herself, but by the fourth time, Sara was in tears. She left for the bathroom with her cell phone in her hand.

### **Fraternized Student**

Having been a TA before, Angela knew what to expect from students. One of her students, James stood out from most of the class by being obnoxious, but very smart. As the semester progressed, she noticed James withdrawing from doing experiments and socializing more. While in lab, James mentioned that he was pledging a fraternity and learned that Angela was part of the Greek system as an undergraduate. James asked lots

of questions about her experiences in juggling her time between her academics and her sorority.

In the middle of the pledging period, and several days before the second gen chem exam, James asked Angela where he might get some Adderall. Angela acted like she didn't understand his question and changed the subject. While proctoring the exam a few days later, Angela noticed that James looked lost and didn't know what to do. When James turned in his exam, she flipped through it. All the multiple choice questions were randomly circled. None of the short answer and nomenclature questions were answered. James' behavior worried Angela, so she emailed James and asked him out to coffee, so they could talk about the exam.

When they met, Angela found out that James wasn't doing well in any of his courses, because he was having a hard time juggling his pledging with his schoolwork. Angela told him that it might take awhile for him to figure out a schedule that works best for him, but also bluntly told him that devotion to Greek life wasn't worth flunking out of school. In addition, Angela advised James to meet with his professors and also see a counselor.

Several weeks later, Angela discovered that James had not met with any one about his problems. She wondered whether it was worth her while or even appropriate for her to get involved with students' problems beyond those associated with the lab.

### **Free Points for Nothing**

Kristen is a first year TA. Never having instructed a lab section before, Kristen looked to her undergraduate General Chemistry Laboratory instructor, Professor Swartz, for inspiration. Professor Swartz was always really demanding of his students, expecting top quality lab reports, in content, grammar, and aesthetics, as well as perfect punctuality. Despite all the tears and stress she witnessed, Kristen knew that Professor Swartz was an excellent teacher for preparing freshmen for all the basics of laboratory procedure and write-ups, having her own experience as affirmation, and hoped to emulate that instruction for her students now that she was a TA in graduate school.

Dr. Barnes, the instructor for General Chemistry and Kristen's supervisor, was very involved in teaching of lab, giving pre lab in class as well as attending at least the first half of every lab. He was much more lenient than Professor Swartz had been. Kristen was forced to tweak her plans for her teaching style, but thought that she found a decent balance in the end.

On the day that the second lab report was due, one of her students, Casey, told Kristen that he forgot to bring his lab and begged her to let him bring it to her later. Kristen had been very clear on the first day of lab that lab reports were due during lab and that she would not accept any late lab reports. However, she knew that the lab would not take the entire time, so she told Casey that she would accept the report if he would email it to her before the lab period was over. Casey was appreciative and told Kristen that he would be sure to email it to her. Kristen never received anything, so she gave Casey a zero on the report. The next lab period, Dr. Barnes asked Kristen about the zero and Kristen told him what happened. Dr. Barnes told Kristen that she should keep pestering Casey for the report and that if she didn't get it in another week, she should just give him

a 3/10. Kristen felt that that was highly unfair to both her and the other students, but did not know if it was her place to question Dr. Barnes.

### **Free Tutor?**

Jamie was a recitation TA for non-majors' organic chemistry. All of her students loved her as a TA because she was able to explain the concepts clearly in recitation. On several occasions Jamie was asked if she would privately tutor her students. Each time, Jamie politely declined. Christina was a motivated student in one of Jamie's recitation sections. One day, Christina said, "I really picked up a lot from your recitation. How much do you charge per hour for private tutoring?" Jamie responded, "I'm sorry – I don't do private tutoring. As a graduate student on contract, I am not formally allowed to do so. Moreover, I'm afraid I don't have the extra time." Christina looked disappointed, and Jamie felt bad that she was not able to help. Jamie quickly added, "But you are welcome to come to office hours. If you really feel that you need the help, I'd be more than happy to stay an extra hour or two. Since there isn't a class that comes in after recitation, you can also stay for a little longer after class."

As the news spread, more and more students took advantage of the offer and began to stay after recitation was formally over. Soon, it reached a point where Jamie was spending an additional 5+ hours a week essentially tutoring her students. The situation was even worse right before exams. Since the recitations were held late at night, Jamie would not get home until 10 o'clock on occasions. This interfered with her studies, but Jamie did not want to disappoint her eager students when they needed her.

### **Friendly Invitation**

It was the luck of the draw and Rebecca got to TA a Saturday lab. Every weekend she had to get up early and hurry to lab. Her students were also very hard-working and tended to be older students who had regular weekday jobs. They came from another campus some distance from the main campus, so they also had to get up early even on Saturday. Each time when they finish the lab, Frank and his lab partner invited Rebecca to have dinner with them sometime. They were quite friendly and the Saturday labs were pretty casual and relaxed, but Rebecca thought it was inappropriate to eat with her students. So she always had an excuse.

With the final exam looming, Rebecca got an e-mail from Frank asking if Rebecca had time to hold a study group and help them with the revision of their final lab report, they really needed her help. Rebecca felt quite uncomfortable. She didn't know how to reply. She thinks Frank is so friendly that she cannot refuse his request, but she senses that the invitation is more than a request for help in the course.

### **Full Credit for Showing Up**

Noah, a TA for the organic for non-majors class, has a good relationship with his students and believes he grades their lab reports fairly, even though some of his students think he grades too harshly sometimes. Despite this, Noah continues to require pre-lab questions, as well as detailed results and discussion sections for each lab report.

One day, one of his students told Noah about Jeremy, a TA for another section who does not require pre-labs and is much more relaxed about grades, often giving full credit for simply completing the lab. Noah replies, “Jeremy is writing his doctoral thesis and needs to graduate before he starts a job he has accepted. He does not have much incentive for teaching and is more worried about finishing his research dissertation than spending time intently grading papers.” Noah goes on to say that, while he understands Jeremy’s situation and empathizes with him, he will not lower his standards just because other TA’s don’t grade as thoroughly. Noah tells the student that even though he may grade a little tougher, in the end it is better for his students because lab won’t just be a get-in-get-out type of class. Rather, they will actually get something out of it, and will perform better in future labs and classes. After patiently listening, the student says, “That may be well and good, but I’d probably have a better chance of getting into medical school if I were in Jeremy’s section.”

### **Getting Better Each Time**

Gretchen was a first year graduate student TA who taught three lab sections a week. With all of her courses and other responsibilities it was a challenge to be prepared for her first lab each Monday. After getting through that lab, she had a pretty good idea what the experiment was all about and by her last lab of the week she was in command. While she was home at Thanksgiving, she was chatting with her mom about her impressions of graduate school and her observation of how it took her three labs to really have things under control. Her mother, a teacher, asked, “If you were a parent and could tell your child which lab to register for, which would you suggest—at the beginning of the week or the end?” Gretchen immediately said, “The end”. Her mother then stopped her cold, “What you are telling me is that students in your first lab of the week are not getting your best effort. Due to no fault of their own, they are put at a disadvantage in the course because of your inability to prepare properly. Don’t you think that is unethical?!”

### **Getting Rid of the Haze**

Every time Ming came in to prepare for her lab section, she found that the TA before her had not made the students wash up their community glassware. There was always a haze on the glass from soap or residue from the last experiment. This really irked Ming. If the students didn’t clean up after themselves, then it should be the TA’s responsibility, but it certainly wasn’t Ming’s responsibility to clean up before AND after her lab section. However that was what she ended up doing. When she brought up the issue at the weekly TA meeting, no one admitted to causing the problem and no one seemed to be concerned. It seemed as though the TAs didn’t care, didn’t notice, thought it was someone else’s responsibility, or figured that it didn’t matter that the glassware was dirty.

### **Ghost Student**

Kevin, a new TA for General Chemistry lab, is kind to his students. He is patient with every question, even those that reveal deep misunderstanding. However, as a first time TA, he lacked the experience to deal with the many problems that arise in a teaching laboratory. Stephen was a student in Kevin’s lab who seemed totally uninterested in

chemistry. At the beginning of the semester, Stephen came ten to fifteen minutes late for every lab, and he always let his partner do most of the work. A month later, things got worse. Stephen offered all kinds of excuses for missing the labs. Kevin began to understand the older TA's joke about, how many grandparents do these students have?

One week Stephen arrived at lab and told Kevin he had forgotten to bring his goggles, "I'm going back to the dorm to get it", he said. "All right." Kevin replied. However, Stephen did not come back until the last minutes of the lab, and copied his partner's paper for that lab. The next week, Stephen told Kevin his stomach did not feel good, "I'm going to the restroom." he said. Then he disappeared for one and half hours, coming back in last half of hour and copying most of the data from his partner again. In the lab two weeks later, he disappeared for more than one hour again. Kevin came to him and said "Are you okay? Where were you going?" "I forgot to print the score of pre lab quiz, so I went to library".

### **Gloves on Feet**

Jennifer came to the titration lab with her toes open and her skin exposed around her waist and shoulders. Her TA, Helen, is from China. When Helen saw Jennifer, she explained the safety rules and asked her to go back to her dorm room and put on clothes appropriate for lab. But Jennifer protested, "I don't live on campus. I commute an hour and a half every day." Helen apologized and found a lab coat for Jennifer. However, she couldn't find extra shoes for Jennifer. Jennifer was very clever. She took off her sandals and put disposable gloves on her feet. "There," she said, "I've covered the exposed skin. Can I start lab?" Helen replied, "According to the safety rules, that won't do. There may be glass on the floor and spilled acid or base may burn her exposed feet. Covering your toes is not enough."

But, Jennifer didn't think it was a big deal and figured nothing dangerous could happen to her. She kept arguing with Helen and tried to persuade Helen to let her stay in the lab. "Why can't I stay in the lab? Those rules are stupid. Besides, can't you ignore them just one time?" Helen insisted that Jennifer should leave the lab, but arguing in English with Jennifer was difficult and not very effective. Jennifer wouldn't take "no" for an answer. It was creating quite a commotion and interfering with the lab. Finally Helen threatened, "If you don't leave, I am calling campus security."

### **Go Get Your Goggles**

Greta is a teaching assistant in a large chemistry class for freshmen non-majors. Although most are conscientious students, they are undisciplined and worry a lot about grades.

During one evening lab involving a lot of heating, bubbling liquids were everywhere. In the weekly TA meeting, the lab supervisor had cautioned about the dangers of this particular lab. Thus Greta constantly reminded her students to wear goggles and be careful while performing the experiment.

She asked Bill to wear goggles three times, and every time he nodded his head and went on with the experiment. Finally, Greta went to his bench and angrily insisted he

put on his goggles. “How many times do I need to tell you to put on your goggles?” She asked. Bill had forgotten his goggles, but tried to play games. He pretended to look for them in his back pack, and finally said, “I can’t find them. I must have left them in my dorm room or the dining hall.” Greta responded, “Well then, run back and get them or leave the lab.” In order to make Bill take things more seriously, Greta took 10 points off of his lab grade for the experiment. Bill protested.

### **Goggle Goof-off**

Everyone knows that no one likes wearing the splash goggles during labs. While most of Jessica’s students took this necessary evil with a grain of salt, she could always count on Mike to be caught with his goggles off. Despite safety talks in the beginning of lab and multiple warnings, he was always taking them off and leaving them on top of his head long enough to get caught and scolded. Every time Jessica chastised him he seemed to laugh it off and despite taking points off on several of his labs, the point did not hit home. On one occasion, she even made him wear two sets of goggles, one set worn properly over his eyes and one set on his head. Even this didn’t faze Mike into adhering to proper lab safety.

### **Good Chemistry?**

From their first interaction in general chemistry lab, Thomas and Kimberly exhibited mutual signs of attraction, call it “good chemistry”. Thomas, a first year TA, had been told jokingly by peers that freshmen labs were a great place to meet women. Joking or not, Thomas saw his new instructing position not as an academic burden but rather buffet with no cover charge. With each passing lab, Thomas would spend less time supervising the lab practices of students and more time conversing with Kimberly. Soon Kimberly began showing up to Thomas’ office hours, all of his office hours. Soon his closer peers began to take notice of the beautiful girl showing up twice a week at the same time. Hank, one of Thomas’ buddies and a fellow 103 TA, asked with a smile, “So what kind of help are you offering her. . . ?” Caught a little off guard Thomas replied “Acid-base stuff,” immediately realizing that no gen-chem classes had yet covered acid-base chemistry. Hank walked away with a smile.

The next lab, Thomas asked Kimberly out to dinner. Without hesitation she agreed and the date was set for Thursday night. Friday morning rapidly arrived and Thomas waltzed into the graduate office grinning like a man who just learned he could walk on water. Hank had a pretty good idea why Thomas was in such an impeccable mode but he dared not say anything in front of the other TAs. Thomas sat in his office and graded the lab reports he intended to return during the afternoon lab with Kimberly. He went through each lab taking a point off here and there but if the percent composition was significantly off, he took 15 points off. Unfortunately for Kimberly, her data was off by more than 30%. Nonchalantly, Thomas deducted 20 points and moved on to the next report. As he distributed the reports in lab, Kimberly saw her grade and immediately approached Thomas. “I think you’re going to change that grade right now or it’s going to be a lonely Newark night for you,”

### **Good Night**

Roger liked the social life around campus and every weekend attended the parties at Beta Iota Omega, the fraternity he belonged to in college. He found it relaxing after all of his graduate courses and ordeals as a laboratory teaching assistant in BIO 101. At one of these parties about halfway through the semester, things were breaking up around 2 AM when a young lady who could hardly stand up staggered toward the door to leave. Roger recognized her as a student in one of his labs. “Joan, are you alright?” he asked. In her almost uninterpretable slurred reply, she indicated she needed some help getting back to her apartment. Roger recognized that she would have difficulty getting home unescorted, so he walked her slowly back to her place, where she thanked him with an clumsy embrace and asked, “Would you like to come in?”

### **Good Students?**

Early on, Carl recognized Ryan and Sara as perhaps the brightest students in his biology lab. However, their lab-partner friendship blossomed and chemistry between increased by the week sometimes leading to inappropriate behavior that bothered Carl. They did not focus on work in lab. They were too involved in each other and fooling around! Nevertheless, they continued to do very well on lab quizzes. Carl didn't quite know how to handle the situation. In desperation, he decided everyone should change lab partners for the second half of the course. Ryan saw through the scheme and made some nasty remarks to Carl. Carl responded, “Look, if you need to talk with Sara, there is lots of time after class.”

### **Goodness Gracious! Great Ball of Fire**

Bobby was a first year teaching assistant assigned to supervise three sections of general chemistry. His students had limited or no prior exposure to chemistry. The first two weeks ran rather smoothly for both the students and Bobby, leading to a false sense of comfort. However, this illusion of utopia changed during the third week.

Bobby gave a brief demonstration on how to properly light a Bunsen burner that the students needed to use in their experiment. They were to determine the water of hydration for an unknown salt by measuring the weight loss after heating. Bobby announced, “Goggles on,” and the students began their experiment. After each student had setup their apparatus, Bobby walked around to verify that everything was correct before the burner could be ignited.

Unfortunately, Bobby failed to notice the small, almost invisible crack in the rubber tube connected to the Susie's Bunsen burner. Three minutes had passed without a major problem, and almost all of the students had weighed their unknown samples and began heating them. As Bobby walked over to assist a student who had raised her hand, Susie let out a shriek that resounded into the hallways. Bobby turned to see a large ball of fire coming from a disconnected rubber hose. He could just make out the faint outline of a person behind the wall of fire.

### **Goof Off Justice**

Michael and Joe were lab partners in PChem. During lab, they spent most of their time chatting, going to the hall to make cell phone calls, and laughing a lot loudly. Their TA, Betty, warned them several times to stay on task and quiet down, but they told her to cool it. The only thing they had left to do was to wait for the equipment to give them correct data.

However, several days later, Michael and Joe came to Betty's office to ask for a make-up lab because their data wasn't correct. Betty said, "I don't think it is possible for you to redo your lab in another section. I can check and get back to you, but I'm pretty sure you will just have to use the data you have." Michael pleaded, "Betty, I really need to get a good grade otherwise I will lose my scholarship. Please do us a favor."

Betty was reluctant to let them make up the lab because they just messed it up by goofing off and not paying attention. If she gave them the chance, it seemed unfair to others. What's more, she was also worried that if she gave them a second chance, they would do the same thing the next time.

### **Grade Deflation**

James takes his TA duties very seriously. When he grades students' homework, he grades really carefully and strictly follows the rubrics from the professor. The students in his sections get lower scores than in the sections of other TAs. James's students are unhappy and give up on their homework because they think James will never be satisfied and they can do nothing to get higher grades. James's students complain to the course instructor. They want to change sections to one with another TA who doesn't grade so harshly. The instructor also feels unhappy about James because he always hears negative comments. And James is uncomfortable when teaching labs or explaining questions because some of his students give him hostile looks. James thinks he is just being responsible and doesn't think his standards are too high. Nevertheless his sense of responsibility brings trouble to both himself and course instructor.

### **Grade Grubber**

Peter spends extra time trying to make his freshman general chemistry lab interesting and hopefully create an environment where students will learn more. However, Peter sometimes questions whether his extra efforts have the desired effects. For example, his student Robert works pretty hard and got an "A" on the first exam. His lab reports clearly list each step and the results. In lab, Robert asks frequent questions regarding the experiment and lab reports. Thus, on the surface, Robert looks like a model student. Nevertheless, Peter feels somewhat uneasy about Robert's motivation.

Peter could see that Robert focuses more on getting a good grade than on learning or understanding new things. Too often for Peter, Robert asks questions like, "Will this be on the exam?", "Will you take points off for grammar?", or "Do I need to include every step of my calculation?" He never gets into a discussion with Peter about what the results mean or how they relate to the world outside the lab. As the semester goes on and Robert has a borderline grade, he argues with Peter about points taken off each lab report.

## Grader Aid

TAs for General Chemistry help grade examinations. After each exam, all of the TAs gather in a large room with tables where they can spread out. For consistency, each TA grades a different problem using rubrics provided by the course instructor (who also provides pizza and soda as the session continues on into the wee morning hours). If there are any questions about particular students, someone is there who knows the student in this very large class.

Although there is no obvious competition, there is a certain amount of pride when students in a TA's lab sections do well compared to students in the other sections. When Grady came to his best student Mark King's exam, he expected a correct answer. However, to his surprise, Mark had erased a correct answer worth 10 points and replaced it with a wrong answer worth zero. Grady gave Mark half credit and went on.

## Grades are Not Important?

Justin is a sophomore taking his first organic lab. He shows up on time every week and performs the experiments without any major problems. His TA, Gretchen, noticed that he learns the techniques faster than the other students, and really enjoys being in the lab. The only problem is that he does not put any effort into the lab notebook or the lab reports. In fact, he hardly writes any observations in his lab notebook and consequently gets lower grades in class. Apparently, this does not bother him at all, because he never complains.

Gretchen explained to her students it was important to record observations in their lab notebooks. She wrote on the board what she expected to see in their reports. True to past form, Justin continued to ignore the advice and got the lowest grades.

After the fourth lab, Gretchen decided to talk to Justin, because she thought he had a lot of potential and did not want him to fail the lab. When she finally asked him why he put so little effort in his lab reports and notebook, he responded, "I really like the lab, grades are not that important to me, as long as I enjoy doing something, that's all that matters to me.

## Grateful Student

Sara Livesey, a non-major student in the third CHEM-101 lab of the semester, wanted to work in groups or at least in pairs at the beginning of the experiment and asked her inexperienced TA, Felix Lupus, if that was possible. He said, "No, the instructor's book clearly says experiments should be done individually." "But other TAs allow their students to work in groups. You don't even allow us to work in pairs?!", she complained. Felix replied tersely, "That just means other TAs don't follow instructions." Somehow, Felix's answer annoyed Sara and she kept arguing in front of the other students, saying that Felix was a lousy TA because he didn't even explain things to students individually.

Later in the period in an effort to placate Sara, Felix answered a few of her many questions about calculations. As he was walking away, he realized that he had said something wrong and he wanted to correct himself. After apologizing, he told Sara the correct answer. Much to his surprise, Sara wasn't interested, she didn't want to correct

the answer on her worksheet. She said, “That was your mistake, not mine, I want full credit for that part.”

### **Gregarious Group**

Nancy’s lab section had 23 students in it. As a consequence of the odd number, one of her lab groups had three students, rather than two. Because three students work together, there wasn’t enough to do to keep them busy all the time. The group tended to slack off and talk a lot with each other (They got along great) and interrupt other groups.

For the lab on Lewis Structures, each group was required to finish one molecular structure by themselves, show their work on the blackboard, and explain it to the rest of the class. When the other groups explained their work in front the whole class, the three students kept talking and laughing too loudly. They didn’t pay attention to other students. Nancy asked them to quiet down and listen to the presentations by their classmates. But it wasn’t long before they were chattering away again.. Finally, Nancy said, “You will have to leave the lab, if you don’t stop talking during the presentations” When it came time for the threesome to present, they asked for to be excused because they couldn’t draw the Lewis structure for their molecule

### **Grieving**

It was Laura’s first semester as a TA. She was a little apprehensive whether she will be able to do a good job with the students. She decided to give her best effort to help the students. Alicia, a student in her class was always quiet and used to go about doing her work. Laura tried to interact with Alicia many times. But Alicia always kept to herself, finished her lab, and went home. One day her lab went overtime. She was not able to finish the lab at the end of the lab hours. Because her lab partner had to go for another class, Alicia had to stay back to complete the lab.

Laura thought this was a good opportunity to have a nice one-on-one interaction with Alicia. She sat along with Alicia and started talking to Alicia about her family, friends, and campus life in general. When Laura asked her about her family Alicia fell silent. Later slowly she told Laura that her mother had passed away during the summer before school started and since then her father had not been able to go back to work. Alicia was also struggling to cope with her own loss as well. Laura felt sympathy towards Alicia and started wondering whether she could help her in any way?

### **Group Effort**

As part of the new course’s policy, students in an introductory integrated biology and chemistry lab course, students were assigned to groups based on their majors and SAT scores in effort to diversify group members and create groups of similar ability. All semester long, students had no complaints about working in groups or about their group members.

Everything was going the way it should for Phong’s lab until the very last group assignment. Students were supposed to generate an electronic poster as a group assignment for their last experiment and submit it online. Instead of meeting somewhere as a group and working on the poster together, most students put up a shared Google document where everyone could access it from their dorm and write up what they needed

in the cloud. When Phong started to grade the posters she noticed a group neglected to put one of their group member's name on the poster. She also noticed that student whose name was missing did not submit a copy of his electronic poster. Thinking that this was just an error on the student part, Phong made a comment on the poster and received the following email.

Hi Phong,

This is Casey from your 8:00 AM Wednesday lab. We did not put Evan Garfield's name on the poster because he didn't do anything on the poster. He was supposed to write up the conclusion and failed to do so on time when the poster was supposed to be submitted. We had to scramble last minutes doing Evan's part. This is not fair and since Evan did not contribute any work we decided to leave his name out of the poster. I hope you understand.

### **Hard Grader?**

Tom and Mary were lab partners on an experiment to determine the specific heat of an unknown metal. At the end of the lab, they came up to their TA, Calvin, to check their results. Cal saw that their answer was significantly different than the expected result. Following is their conversation:

Cal: "You might want to do the experiment again?"

Tom: "We did exactly what you said and followed the instructions in the book. We already repeated the experiment and the results came out almost the same. That can't be the problem. What would our grade be if we handed in the results we have now? How much would you take off if we didn't get the right answers?"

Cal: "Four points off for each incorrect answer on the answer sheet."

Mary: "Four points...!! That's a lot! Please don't hit us so hard. We worked so hard on this lab." (They looked disappointed)

Cal: "Maybe so, but everybody works hard in this lab."

Tom: "Not really, some students take data from other students... would you please cut us a break. You know, it's not our fault. We followed the instructions exactly and we did it twice.... Can you take 2 points off from each wrong answer, rather than 4 points?"

Cal: "I am afraid that I can't help you, I have to treat every student equally. No exceptions."

### **Hard Work is Not Enough**

Alexis, a freshman majoring in nursing, was typical of many freshmen. She had a good attitude and was determined to do well. She would buckle down and work hard, foregoing activities with friends, in order to study. College biology was much harder than her high school biology class and the professor seemed to expect different kinds of answers than she was providing. Both the lecture and lab section made her feel exhausted. Despite her extra work, her performance was still far from her satisfaction.

Alex's TA, Penelope, understood her difficulty adjusting to college and encouraged her by asking questions via e-mail or having her come to office hours.

Actually, it did work. Alex's scores gradually improved, giving her more confidence. However, that disappeared when she saw the score for her last lab report. Due to bad storm, she didn't come to Penelope's office hour. Instead, she did a lot of reading and data searching, hoping she could manage on her own

She had trouble looking at her grade. "It's unfair!! I devoted so much time and energy into this report. How can I get such a low score?" Alex decided to talk to Penelope and argue about this "unfair" grading. Actually, it turned that her report revealed lots of confusion about basic concepts and improper citation as well. The reality made Alex feel upset and then she burst into tears. "I did try my best. I just want to get a decent score in this course and not to fail it. But I just can't achieve it. What should I do now?"

### **He Doesn't Seem to Get It**

Every week in her chemistry lab, Elise explains the purpose of the lab, what calculations need to be done, and where the students need to look for what they need to know. Most students can follow this and do the lab independently. However, there is always one student, Johnny, who comes up and repeatedly asks her how to do the lab, from procedure steps to calculations. He claims he cannot understand the lab book and wants more detailed step-by-step lab. No one else in lab seems to have a problem with the instructions in the lab book. Elise's response to him on numerous occasions has been, "What does your lab say?" and his response is, "I don't know, the lab book is confusing." Even when Johnny is working in a lab group, he still has numerous questions about how to do the lab.

### **Headache?**

Mike walked into lab on week three and noticed a new student. Before lab started, Jessica approached Mike and explained that she had missed the first two labs because she had been recovering from a concussion. Mike then explained that she would need to get a doctor's note for the labs to be excused. She understood and said she would bring it to the next lab.

In the middle of that week's lab Mike noticed that Jessica was no longer in the room. A few minutes later she walked back in and appeared upset. Jessica asked to see Mike outside and started to explain that she just received bad news and proceeded to cry. Mike stopped her and said it was ok if she needed to leave and they could deal with it another time when she wasn't so upset.

The next week Mike received an email from Jessica explaining that during lab she received news that one of her friends from home had passed away and then followed by saying she wouldn't be in lab again this week. However, students are only allowed to miss three labs before they fail the course.

### **Hearing the Hearsay**

Near the end of his 7-9PM evening office hours, two of Mike's students (brothers) walked in with homework problems due the next day. By the time Mike helped the brothers work through several questions on the problem set, the clock approached 10PM.

As his frustration level rose, his replies became shorter, while attempting his best to not give away any answers. The brothers, after realizing Mike would not just give them answers, packed up and left at 10:30PM.

Mike graded the homework problem set that weekend. The brothers were not happy with the low scores they got when the homework was returned in lecture. Later that week at the close of the TA meeting, the course professor asked Mike a peculiar question. "Harry and Lloyd wanted me to regrade their homework because they thought their answers were right. They said they did the homework just like you told them to get the right answers. What did you tell them?"

### **Helper**

It was Alexis's first semester as a TA, and things were generally running smoothly in her lab sections. Her students were clean, friendly, hardworking, and eager to learn with the exception of Walden. He was a bit of a know it all. When Alexis was helping the other students, Walden would often butt in and "help out". He was a more experienced student, who had already taken the class but had to drop out and was now reenrolled. In addition, he had spent a summer working in a research lab and never missed an opportunity to let everyone know. He always seemed to have something to add to the end of Alexis's statements, usually to the effect of, "as fellow expert on the subject matter, I concur". Helping your classmates out is one thing, but Alexis felt like Walden was undermining her authority by constantly trying to act as an assistant TA of sorts. She had tried lightheartedly telling Walden to leave the teaching to her, but he was persistent and Alexis only began to grow more frustrated. He meant well, but Walden was driving her crazy.

### **Hold Your Ground!**

Sam was assigned to TA the non-major intro chemistry class for the fall semester. Discussion sections were held every Friday afternoon to reinforce what the instructor taught during the week. The students were provided with worksheets, worth five points, and were encouraged to work collaboratively with other students in the class to complete their assignment. As a TA, Sam's job was to encourage students to critically think through the problems and learn how to use their resources to derive a solution. Helpful hints may be provided to direct students to finding the answer, but by no means, was she allowed to directly tell the students how to solve the problem, or worse, just tell them the answer.

The semester started off well with no difficulties. Towards the middle of the semester, some students began to suffer information overload and couldn't deal with more intricate thought provoking topics. Sam's also suffered from a significant workload in her graduate classes that resulted in less preparation time for the discussion section and an overall stressed-out self!

During one Friday discussion section, after the students had just taken their third exam, the students were responsible for completing a worksheet based on what was discussed in class the previous week. While some students were able to tackle the worksheet with gusto, a majority of the students were clueless and did not know where to start. Sam advised them to look through their lecture notes and directed them to what

page of their book to read, but this did not solve their problem. She went through each question individually and put them in laymen's terms. She even gave them direct hints for each step in the problems, but it was no use... Sam felt as though she had failed as an instructor because she ran out of ways of how to direct the students. Sam did not know if she was the root of the problem due to less preparation time, or if the students were exhausted from their last exam and just did not want to learn.

### **Homeopathy**

Brian had been a biology TA for several weeks and was beginning to feel comfortable in his role. Everything had been going smoothly so far in the semester, and the students seemed to be enjoying the labs. This week the lab was performing serial dilutions and looking at absorbance with a Spec-20. His first lab section had no problems with the procedure. In his night section, however, one of the groups recorded 100% transmittance for every one of their serial dilutions. They tried analyzing their dilutions on a different Spec-20, but got the same results. Brian figured they must have diluted to infinity.

Because there was plenty of time left in the lab, Brian asked the group to re-make their serial dilutions and try again. They did so, with Brian paying close attention to their procedure, but they still got the same results. At this point, the lab was almost over. One of the students, Amanda, approached Brian. "Can't we just use another group's data?" she pleaded. "You watched us do it the second time. This isn't our fault!"

"I know it's not your fault, but you can't just copy someone else's data," Brian replied. "What are some possible explanations for your results?" "Sure, we can think about that, but how can we write a results section without any data?" Amanda countered. Brian persisted, "Wait a minute. You have results. You are just not happy with them. This happens all the time in science."

### **Homework Disconnect**

Introductory biology lab, introduces students to the concept of enzymes by observing the rate of hydrogen peroxide breakdown into oxygen and water by catalase. For the in-class experiment, paper discs are saturated in varying dilutions of potato extract (containing catalase) and placed individually in test tubes of hydrogen peroxide. Students record the number of seconds it takes the bubbles of oxygen to float the disc. In this experiment, enzyme concentration is the variable being tested. For homework, the students were asked to design an experiment testing a new variable that may influence enzyme activity (temperature, substrate concentration, pH, etc.).

After performing the in-lab experiment, the TA, Christine, explained the assignment to the class and handed out a sheet detailing the exact instructions for receiving full credit. Next week, while grading the assignments, she realizes one of her students, Kevin, has completely missed the point of the homework. He had essentially re-written the experiment they performed in class and did not explore how to test a new variable. The assignment is worth a considerable fraction of the homework grade for the semester.

### Hot Stuff

Though excited to teach for the first time, Todd was a little leery about the possibility of a lab related accident occurring in an organic lab course where safety was a big concern. After a smooth first week of labs, Todd's confidence began to build. The second lab of the semester involved having the students purify an organic molecule through recrystallization. During this process, students heat up a solution of the molecule in a beaker and then remove the heat source. During his pre-lab spiel, Todd mentioned that students should use beaker tongs to remove the beaker from the hot plate. Nevertheless, a few minutes into the experiment, Todd heard the sound of shattering glass.

Kelly had dropped the beaker containing the hot solution. When Todd got to her, she just looked up and said nonchalantly, "Ouch, that's hot," referring to the palm sized red spot on her leg. It seemed like she was trying to play it off as if it wasn't painful. Todd immediately asked what happened, but then noticed an old test tube clamp resting on the bench top. He confirmed his initial suspicion with a quick question, "Did you use this?" The group of three girls working together with Kelly, simply said "yes."

### House Guest

First year TA Erica had 17 students in her lab, the typical number in General Biology labs. On occasions, other supervising professors would request Erica to accommodate athletes from their sections to her Wednesday evening lab. Even though her lab was full, she always agreed to take the extra student. Dr. House (a different supervising professor for General Biology lab) asked Erica to accommodate Amy, a setter on the volleyball team who needed to switch her section for a couple of labs because the team travelled on two days when her normal lab was scheduled. Erica welcomed Amy to her lab, and soon, Amy became comfortable with Erica and her new group members. After the two approved lab periods, Amy continued to attend Erica's lab session instead of going back to her original schedule. Two more lab periods had gone by this way when Dr. House asked Erica if another student could attend her evening lab to make up a lab for that week. A bit perturbed, Erica said, "Are you kidding? My lab is already over the limit with Amy coming every week." Dr. House was surprised. "What's she doing in your lab? She was only given permission to attend two of your lab sections."

### Hurricane Damage

Friday night. It's raining outside when Dwyane receives an e-mail from the university stating that due to the threatening hurricane, all the classes on the next Monday are cancelled. Though initially excited by the news, he suddenly realizes he has a Saturday lab to teach the next day. "What will happen to the Saturday lab?", Dwyane wonders. The e-mail only said that all the classes on Monday will be cancelled, no words about Saturday. So Dwyane sent an e-mail to his supervisor for clarification. But it's Friday night, the supervisor doesn't respond. Without receiving any information from the University to have the TAs cancel the Saturday lab, Dwyane assumes that the lab should continue. When he arrives at the lab, only 7 out of his 18 students are there. After the lab,

Dwyane sends an e-mail again to his supervisor asking how to deal with this situation and any make-up labs. Because just a few of the students came to the lab, any make-ups would be over loaded. On the other hand, to drop grades for that lab seems unfair to the ones that came. Several days later, the supervisor replies that all the labs for that day are excused. Now Dwyane doesn't know how to explain it to the students that did come to lab.

### **I CAN'T WORK WITH YOU!!!!!!!**

As a part of their requirement in biology lab, Sheldon and Amy must complete and present a final poster on their work.. Unfortunately, Sheldon and Amy don't work well together which has created challenges for Penny, their TA. Sheldon spoke with Penny on the day the assignment was due. "I tried repeatedly yesterday to contact Amy so that we could work on the poster together. When I finally got ahold of her, she said she had already completed the assignment on her own. Do I have to submit a separate poster, and if so, can I have an extension?" Penny said she would have to talk with Amy and Dr. Jenner before she could decide.

When Penny talked to Amy, she got an earful. "I am so sick of working with Sheldon!! He never pulls his weight in lab or outside of class. I feel like he's incapable of doing the experiments and I always have to double check his work. On top of everything, I have been doing all the work and he's just been riding off my grades. I am sick of it. So this week I completed the poster and only put my name on it." When Penny asked if Amy had tried to contact Sheldon to work on the assignment, she said, "No, but he waited till Tuesday night to contact me and that's just a day before the work was due. So I informed him I had already done it. As far as I am concerned he should get a zero for the assignment and fail the lab."

### **I Lost My Lab Notebook**

One day Heather came to her TA before lab. "Ben, I seem to have lost my lab notebook. I can't find it anywhere. What am I going to do? I don't have the instructions or the results and post-lab worksheets I need." Ben took sympathy on her, "Look you can borrow my copy for today, but give them back to me before you leave." Ben got his papers back at the end of lab and didn't think anything more of it.

The next week Heather showed up before lab. "Ben, guess what? I haven't found my notebooks yet. Can you loan me your sheets again, just for today?" Ben was slightly annoyed but complied with the request. "Okay, but next week you need to find yours or buy a new copy. This is your responsibility, not mine."

The following week Heather approached Ben again. "I couldn't find my lab notebooks. I just came from the bookstore and they're all sold out." Ben replied, "Then I guess you are out of luck."

### **Ice Water**

One day Dan noticed a Jake and Toby eating ice from the ice machine. The sign on the machine clearly stated that ice was not safe for human consumption. He casually went up to the students and asked, "What are you eating? You know food isn't allowed in the lab?" They laughed and Jake responded, "We're not eating food. It's ice." "Where did

you get the ice?” Dan then asked. Toby told him they had gotten it from the ice machine in the hall and that it was okay. He said that their TA last semester told them that the sign was just there to discourage fraternities from emptying the machines before big parties.

Dan noticed that both students had bottled water with them to drink. So he asked, “Why do you guys buy bottled water when tap water is free?” Jake said, “Everybody knows that water from the drinking fountain is not good for you and besides it tastes bad.” To which Dan asked, “And where do you think the water comes from that goes into the ice machine?”

### **IF\*AT Cheating?**

Greg used the combination of multiple choice questions and lottery ticket technology known as Immediate Feedback Assessment Technique (IF\*AT) for the prelab quizzes each week in organic lab. The students put their answers onto a multiple choice form by scratching off A, B, C or D for each question. The correct answer has a star behind the scratch off layer so they would know immediately if they were correct. If multiple answers were scratched off, the answer could only get partial credit.

This was all well and good except, if students received an extra card, they could simply use it to find all the correct answers, throw away that card, and turn in the second card with only the correct answers scratched off and get a perfect score. To avoid that, Greg carefully counted the answer cards as he passed them out, ensuring each student only received one, so he thought. The questions are usually hard, so students rarely get a perfect score. One day Greg had a student with a perfect score and coincidentally found a partially completed IF\*AT answer sheet after lab in the trash can in the hall outside the lab.

### **I’m Not Superman**

Clark Kent was a TA who taught a lab for physics seniors. He had the Monday lab, the first lab of the week. Sometimes the instruments did not work properly. Prof. Huber, who was in-charge of the lab, had a very busy schedule and traveled a lot to conferences. Although he didn’t have much time for the labs, he demanded a lot from both TA’s and students. When there were problems, somehow the TA’s got-together and solved them by middle of the week and the rest of the labs ran smoothly. When ever there was a problem, Prof. Huber got angry and took it out on the TA’s but never seemed to offer help.

Clark tried his best to do his lab, but unfortunately sometimes everything fell apart. The semester was overwhelmingly stressful, not because of the students but because of the professor. Clark was drained and was tired of trying to be Superman. As soon as classes were over, he made a request, “Please don’t give me any of the labs supervised by Prof. Huber next semester.”

### **Impatient Students**

It was Monday and as was her luck this semester, she had the first lab of the week. If there was going to be a problem with the lab, she would have to deal with it first. She envied those TAs who had Thursday and Friday labs when all of the problems had been resolved. As a first time TA, she didn’t like the role of running interference for all the other TAs for freshman chemistry laboratory. “Why didn’t they assign my labs to a second-year TA”, she lamented.

One week Tracy received revised lab instructions two hours before she was supposed to teach the lab. The lab was a simple titration of a glycine, diprotic acid. She did not have time to properly prep the experiment, but it was straight forward and she wasn't worried about it. When she got to lab she ran through the lab with the students and told them to get started with the experiment. The students knew what was expected for the lab and when they took the initial pH, it was already neutral, not what an acid should be. Tracy rolled her eyes. "Oh no. Not again!" she thought. "What's wrong. What do I do now?"

### **In Class Illness**

During the semester Dr. Smith asked his TAs to help proctor in-class exams. They were able to choose the exam that best fit into their schedule. It was the last exam of the semester and Jenny the TA was signed up to help. During the exams both Dr. Smith and the Jenny were in the room keeping an eye on the students taking the exam.

About 10 minutes into the exam a student in the back row began to feel very faint and raised her hand. Dr. Smith went to the student who explained that she felt nauseous and thought she was about to pass out. Dr. Smith asked Jenny to accompany the student to the health center and to call Public Safety, if she needed help along the way.

As soon as Jenny and the student left the room, the student began to feel very sick and thought she might vomit. Jenny quickly brought the girl to the bathroom but didn't know if she should follow her in to make sure she was okay, because she didn't know the student at all. She didn't want to immediately call Public Safety in case it wasn't a real emergency and embarrass the student.

### **Inappropriate Relationship**

During the first couple weeks of school, Mary had become good friends with another first year TA, Emily. Emily was a very outgoing TA. She quickly made friends with all of her students. When Mary stopped by Emily's lab section to ask questions about the upcoming lab, she noticed that Emily seemed especially friendly with an older returning student, Mike. After a few weeks of TAing, Emily confided in Mary that she had secretly started dating Mike. Mary was concerned about Emily's behavior because inappropriate relations between TAs and students were covered extensively in the TA training. Mary knew the consequences were severe. A few days later, Mary became even more concerned when she heard rumors from her lab students that Mike was getting perfect scores on his lab reports. Mary didn't want reveal her friend's secret to the course instructor, but she didn't think what Emily was doing was right.

### **Incorrect Source**

At the beginning of every lab Tracy's students turned in their pre-lab assignments which they finish before coming to lab. Usually, the pre-labs consist of definitions and often include thought questions pertaining to the lab so that the students would have a better understanding for the concepts of that particular lab.

Tracy was venting to another graduate student, "The students rarely seem to learn anything from the pre-lab assignments. They just copy the definitions, word-for-word

from the glossary in the back of their textbooks. For example, in one lab, the definition in the back of the book for one of the pre-lab questions was incorrect. Instead of determining the right definition by reading through the material in the book, most of the students simply wrote down the wrong definition without even realizing their mistakes. Only a few students even noticed the mistake and found the correct definition.”

Continuing Tracy said, “When I graded the pre-labs, I marked off for the wrong definition and gave credit for the correct ones. However, when I handed the pre-labs back at the next lab, many of the students were upset that I took off points for a definition that their resource gave them. One guy said, ‘I got this definition straight from my textbook, so it can’t be wrong.’ My response was, ‘Yes, but the definition in your textbook was incorrect, therefore you have the wrong answer.’ But he continued to complain, ‘How was I supposed to know that the definition was incorrect? I did the work to look for an answer, I should still get the credit.’”

### **Indecent Exposure**

In the first week of classes TA Natalie spent the majority of time going over policies and laboratory safety. She put a lot of emphasis was the proper attire. She even gave them the idea to keep a pair of sweatpants in their backpacks, so they would be prepared for lab, but wouldn’t have to wear pants for the whole day since it was in the summer months. Therefore, she was surprised when two students showed up to lab the following week wearing shorts. Natalie notified the students, Ryan and Andrew that they were not in proper attire and would not be able to participate in the lab resulting in the first of only two allowed unexcused absences. Andrew then remembered that he had sweatpants in his bag and had simply forgotten to put them on. Ryan, on the other hand, did not have pants. The class policy states that students have to wear pants or shorts long enough to completely cover their knees while in a seated position. Knowing this, and with the threat of using one of his unexcused absences so early in the semester, Ryan proceeded to pull his shorts down as far as they could possibly go without exposing more skin. He showed TA Natalie that his shorts did now completely cover his knees, but she didn’t know whether to laugh or to kick Ryan out of the lab.

### **Inefficiency vs Impatience**

One group of lab partners in Mary’s biology lab section is slow to finish their lab and lags behind the other groups every single time by as much as an hour after the first group has finished. Thus, she has to hang around the lab waiting for this slow group.

One day when time was dragging on, Mary asked what was taking so much time. Joe explained, “We need at least 20 minutes to read the descriptions and fully understand the lab manual before starting.” His lab partner, William, added, “We need some time to draw illustrations for the lab.” Frustrated Mary asked, “Why can’t you do all of that before you come to lab? That’s what other groups do and that is what I expect you to do.” Joe replies, “But we have plenty of time to do this in the lab. We have three hours to do the lab and so we don’t need to rush.” William notes, “Actually, we do finish our lab within three hours.” Mary then says, “Yes, but some labs are really simple and short. You

certainly don't need three hours to finish them." The two students just shrug their shoulders.

### **Inhaled What?**

One day, Susan came to her TA, Janice, because she had inhaled a little bit chloride gas. She was worried about her health. Janice didn't think it was a big deal, so she asked Susan, "How are you feeling now? Do you feel dizzy? Are you okay?" Susan answered, "I think I am okay, but do *you* think am I okay? I don't want anything terrible to happen to me." Because Susan didn't complain about burning eyes and nose associated with chlorine gas exposure, Janice was sure that Susan was okay, so she just wanted Susan to calm down.

Her strategy was to make up a story to make Susan feel better. "Susan, I had a really big accident last April in the lab. One student had an explosion and the inside of this lab was filled with chloride gas. We inhaled lots of the chloride gas. Forty-six fireman and twelve ambulances came to the building. They took us to the hospital as a precaution. After more than 3 hours, the doctor told us we were fine. So, you don't have to worry about that right now, even if you feel a bit dizzy."

When Janice finished her story, Susan looked more comfortable. Finally, Janice asked Susan one more time about her feeling before she left the class, "If you want to go to the health center, we could go together."

### **Inside Information**

Cindy is a teaching assistant for three sections of the Introductory Chemistry laboratory. Most of her students are non-science majors. She has difficulty interesting them in chemistry and they seem only to want answers and expect Cindy to provide them. Although Cindy tries to make the lab interesting, her students rush through the lab to get out as soon as possible. This then results in poor lab grades. Clearly, the class is just a requirement for them. "Get in and get out" is their attitude.

Recently, Cindy has noticed a group of three girls who finish every lab an hour early. When Cindy grades their lab reports, they all receive very high marks, in contrast to the rest of the class. As best she can tell, each one does her own work. However, their data very much resembles the data in the Instructors' manual Cindy uses for grading. Even their post labs have similar phrases as in the manual, but not exact. Cindy suspects they have obtained a copy of the manual.

Over lunch with other TAs, Cindy asks, "Am I being too suspicious? How could I prove they have a copy of the manual? Even if they have a copy, it may be unfair, but is there anything I can do about it? They seem to be learning chemistry as well or better than the other students in the class."

### **Instructions Please**

Eva is a TA for an organic chemistry lab course for chemistry majors. After grading her first round of lab reports and returning them to her students, she received many emails from her worried students because some of the grades were lower than they

were hoping. Eva had been very meticulous with her grading and followed the provided rubric very closely. Some students visited her during office hours, explaining that it was hard to write a satisfactory lab report without being provided with a rubric beforehand. Eva was very understanding of that, but explained that her lab coordinator was rather adamant about not wanting to distribute rubrics among the students.

An upset student came to her office in a very emotional state, “How is there any chance I can improve if we aren’t told what is important to include in our reports? I might as well just drop this lab.” Eva explained that one bad grade is not going to ruin her final grade. However, she privately agrees with the student and believes that it would be more beneficial to the students to have the rubric before writing their lab report. She feels conflicted.

### **Intelligent, But Lazy?**

Michael had his share of issues to start with as a new biology TA, but he soon got the hang of things. His students enjoyed the labs and were doing a good job of grasping the material. Their grades were reflected that. About halfway through the semester, he noticed that Josh failed to turn in a lot of assignments on time or even altogether. Normally, this would be something he would have expected out of his weaker students, but Josh didn’t seem to fall in that category. The work Josh turned in was well done and actually better than most of the students in the lab. Michael wondered how or even whether he should approach Josh about his performance in lab. After all, Josh was an adult who knows what is expected. Why should he be of things he certainly knows?

### **International Relations**

Tina, an international student whose first language was not English, enjoyed her job as a TA for General Chemistry. Despite some difficulties at the beginning of the semester when she was getting adjusted to the American education system and how it differed from that back home, she felt that things had improved. When students had problems understanding chemistry, she encouraged them to come to her office hours when she could work with them one-on-one.

A few of her students were serious about chemistry and came frequently to her office hours. They asked good questions and seemed to catch on quickly. On the other hand, there were some students who were really struggling. It took her an hour to explain basic chemistry concepts like the meaning of a balanced equation to a political science major. Another non-science major didn’t understand how to calculate a best-fit linear fit through her data points. Tina began to realize that teaching chemistry involved more than knowing about chemistry. It involved other subjects, like physics and mathematics as well, and the ability to identify the conceptual problems students had.

One day one of Tina’s students who was trying very hard, but not making much progress, came to her office hours. The student was exasperated. Tina tried her best, but just didn’t seem to have the words or approach that made sense to the student. Almost without warning the student started to sob uncontrollably.

### **Is More Credit Due?**

Sally was a tough grader. She often said, “Students won’t learn from their mistakes unless it hurts their grade.” It was her policy that correct answers in the absence of written down calculations received zero credit and her students knew that. One day several students came to argue for more partial credit. They had used the proper formula, but had not converted the temperatures, pressures, and volumes into the proper units for a gas law calculation. Natalie, who had failed the quiz pleaded, “Can’t you give me more credit? I used the correct formula. I just didn’t know that I had to convert the temperature to degrees Kelvin. You gave me only 4 out of 24 points on that problem.”

Sally looked at the quiz. She remembered grading this one. Gently she explained that Natalie had the right formula but had the wrong units and had substituted the values incorrectly. Showing Natalie the grading key, Sally said, “See, you have to use units that match the gas constant R, and you have to cancel the units in the calculation. If you don’t do this, it won’t work out right. Having the right formula is worth four points, but to get more points you have to substitute the values correctly and use the right units.”

### **It’s Our Data and Our Graph**

Stephanie and Mike happened to be lab partners in two courses, chemistry and biology, in the same semester. In both courses they were expected to collect data as a team and write up lab reports. However in chemistry they wrote up a single report which was graded, while in biology, each student turned in a separate lab report for grading.

When they got back their first graded biology lab report after the third week, each got an “F” with “PLEASE SEE ME” written by the TA in large red letters across the top. They couldn’t imagine what they had done wrong. After lab they met with the TA who told them that the syllabus states they had to turn in their own lab reports. Stephanie protested, “But we did. We didn’t copy from each other.” To which the TA said, “Look at your graphs. They are identical—same scaling, same symbols, same caption, same fonts. Everything about the graphs is the same. Clearly, one is copied from the other.” Mike interjected, “That’s crazy. Why can’t we use the same graph when we use the same data that we collected together? That’s not copying. Heck, in chemistry lab we are expected to hand in one report that we write together.”

### **Jabber Jaws**

Students in Hazel’s integrated chemistry and biology lab were encouraged to meet outside of lab to become comfortable working in their groups. Some of the groups found the group activity fun and helpful as they made fast friends. After a few labs, Hazel noticed one such group, Huey, Dewey and Louie, that could not stop talking and they left lab as early as possible without checking out with Hazel. They killed the waiting time in between the experiment by talking rather than focusing on the in-lab worksheets or next steps of the experiment. She tried to make announcements or ask questions to all the groups and specially the trio instead of directly calling them out and embarrassing them. However things went downhill in a two-part lab where the first part of the experiment was to be done in biology lab and the products of first part was to be taken next week to

chemistry lab for further analysis. Hazel made the announcements and wrote on the board about the end products to be collected by the end of the bio lab. Huey, Dewey and Louie were so busy discussing the game from the previous night that they completely missed the announcement. As usual they left without checking out with Hazel. As soon as they left, Hazel realized that they had not collected all their samples, the ones they collected were labeled incorrectly, and were kept in the wrong place. It only meant trouble for next week.

### **Jack Daniels**

Sam wasn't particularly happy with his teaching schedule on Mondays. One lab started at 12:30 PM and the other at 7:00 PM. In addition, he had a class that started at 8 AM. He found it a bit stressful being on campus for such a long day. To make life a little less stressful, he tried to make his evening lab more relaxed. He would joke around with students and generally be laid back. The students were good. They came well prepared and got done in a timely manner. Sam knew everyone's name and felt comfortable with all of his students. They laughed a lot, had a good time together, and seemed to learn chemistry. He decided this was the way to run a lab.

For the last lab of the semester, several of the students got together and brought in a present for the class—a bottle of Jack Daniels. They wanted to do shots with Sam after the lab to celebrate the end of the course.

### **Job in Jeopardy**

Mr. Q is a first year international graduate student TAing a chemistry lab course.

His accent is a very big issue. Often students couldn't understand him, and he couldn't understand them either. One angry student yelled at him, "Don't you know what is going on in this lab?!" Communication was a very big problem! To help the students, Mr. Q sent them website links related to understanding how to do the next experiment. However, the situation was far from satisfactory. Most of students did not watch the video before lab. Furthermore, some procedures described in lab manual were not the same as those done in the actual lab. Trying to help student know how to do experiments, he modified the procedure in the manual. However, after he did this there was a lot of confusion and complaints. Students told him they did not know which procedure to follow. It was really hard for him. He got a lot of criticism from the chair of the department. And his fellowship was endangered if he could not improve his performance.

### **Just a Friend?**

Qin is a first year international TA, it is also her first time to be at USA so she's not very used to everything. But in her lab, she is always patient and helpful. Peter is one of her students who struggled with understanding the subject, so he would ask Qin for help. She was always patient and would explain it again and again. Peter is then very thankful and in return, he would often tell her a lot about America customs and culture. In this way, their conversation would expand to more than just the subject.

One day, after very detailed explanation on the subject and also some other things, they were so surprised to find out it was so late. Qin did not have a car, so Peter

offered to drive her to her apartment. Qin dislikes walking home alone in the dark, so she accepted the offer. Nothing happened that night; however, the next day when she finished her work and came out of the office, she came across with Peter who offered to take her home. The same thing happened several times and it seemed that Peter would always be there to take her home. Qin did not think this was right, but during all this time Peter was very polite and had never implied anything inappropriate.

### **Kate's at Eight**

One weekend Chloe, a first year grad student, had friends visiting and wanted to go out for the night in order to relax. She was tired from a long week of studying, and wanted to let off some steam after handing in a bunch of assignments that week. When her friends showed up, they all were happily catching up and having a good time. They had all planned on heading out to Main Street and seeing how the night life was.

So Chloe and company all headed for Klondike Kate's to have some drinks. Everything was great at the beginning of the night, as the place wasn't too crowded and drinks were cheap. By the time the group headed up to the dance floor, everybody was feeling pretty good. Earlier Chloe had seen and been seen by one of her students, George, but she moved to a different section of the bar and managed to avoid him. However, as everyone was dancing Chloe noticed George getting kicked out of Kate's. Chloe knew that George was underage. She didn't know if she should say something to the student in her next lab or pretend the situation never happened.

### **Keys to Friendship**

Andy, an international student who used that name because he thought his actual name would be too hard for freshman to remember and pronounce, worked hard to be friendly with the students in his lab. During his evening lab, which seemed more relaxed than his daytime labs, a TA from a nearby lab came in. Because she was also from China, she asked Andy in Chinese for the keys to the store room. She had left her keys in the office and needed to get something in the store room. Andy loaned her his whole key case and let her help herself.

As soon as she walked out of the lab, three female students began to laugh and tease Andy, " We saw that, haha." They thought that the TA was Andy's girlfriend and she had asked him for the keys to his car or house. He felt compelled to explain the situation, but to no avail. One student said with a wink and a smile, "We know that and you don't need to explain. Why is your face turning red?" Although he knew they were just joking around, Andy felt really embarrassed because this kind of joking made him uncomfortable and was never the kind of conversation that would occur between an instructor and a student back home. It made him feel he had gone too far and that maybe his efforts to gain students' friendship had lessened their respect.

### **Kicking the Habit**

Hitesh had arrived in the United States only weeks before, so he really didn't know much about the college students in the three chem labs he supervised. His section that met late Friday afternoon had twenty students at the beginning of the semester but was down to ten by the end of drop-add period. Somehow, being smaller and at the end of the week, that section developed a character different than the other two.

Mike, a student in that section, liked the attention of other students and would often make humorous remarks that Hitesh suspected were disrespectful, but ignored because he wasn't sure he understood American turns of phrase. Mike's comments did make the atmosphere rather relaxed. One day Mike asked Hitesh, "What would you do if I kicked you?" Hitesh responded, "I'd flunk you."

### **Know-it-all**

Alice was holding her first office hour and was very nervous about it, despite a week's worth of preparation—what would the students ask? What if she couldn't answer their question? During her office hour session, John, another TA, walked into the room and asked if he could study there. Since no students had shown up yet, she agreed. A few minutes later, a student walked in and asked for help on some stoichiometry problems. While she was helping the student, Alice became stuck on one of the problems and was struggling to answer the student's question. John, upon hearing Alice's difficulty with the question, offered the student an answer and thorough explanation. Alice felt very embarrassed and apologized to the student. John immediately told Alice not to feel badly since he had years of tutoring experience. Alice felt hurt but continued her tutoring session while John went back to working on his homework. When her office hour was over, the student thanked John as she left, raving about how helpful he was, but did not address Alice.

### **Lab before Exam**

Mitzi always tries her best to make sure her students learn what they are supposed to in her lab. Several experiments in the lab manual required more than three trials to get good data. Such experiments usually take more time to finish but can be done on time if the students stay on task. As it turned out, exams for this class are scheduled on specific Thursdays, right after Mitzi's lab section.

One Thursday lab before an exam, one student asked "Can we only do one trial instead of three? We have a big exam after this lab." Mitzi thought a few seconds and answered, "Hmmm, my two other sections finished this lab with an hour to spare. There should be plenty of time for you to study." That didn't satisfy the student who responded, "Please. My friends also have lab today and said their TA let them do only one trial so they could have more time to study." Mitzi didn't know how to answer her students. She checked with another TA who lab was at the same time next door. That class was doing one trial instead of three.

Mitzi didn't want her students be disadvantaged, so she told her section to do one trial. Her students felt happy and quickly finished lab in one hour. However, Mitzi felt this was not fair for her other sections that finished all three trials.

### Lab Prep

A standard microscopy lab involves students measuring the diameter of epithelial cells from their own cheek. To do this experiment they need to first calibrate the ocular micrometer built in the microscope using a scale micrometer on a slide provided to them. The lab manual explains the procedure in great detail. One might think that the students would come to class prepared having read about the procedure ahead of time and being curious to determine the size of their own cheek cells. Not so.

Once again Weiyi's students showed up unprepared and almost the whole class had difficulty calibrating the micrometer. Weiyi had to help each group individually to figure out the calibration. As a result the lab went over the three hours allotted.

### Lab Prep Mix-up

Alice, an international graduate student working as a TA for the first time, had problems in her first lab because she was too nervous to present well. Today, in her second lab, she wants to do a better job. She practiced the INTRO for lab DEMO several times by herself. After her graduate molecular biology class, which ended 15 minutes before the lab, Alice went to the lab and prepared for the DEMO. Unfortunately, she found that the materials prepared are wrong! The lab manual changed this semester, but the things today were for the old version. Alice quickly asked the lab staff to prepare the things she needed just 5 minutes before the lab starts, but it took more than one hour until they materials were ready. She explained and apologized to her students who asked, "Haven't you done the pre-experiment? You should have found that the materials are wrong."

Flustered and frustrated, Alice didn't know how to explain. She had done the pre-experiment with her instructor. They had noticed that the lab manual was changed and had asked the staff to prepare the right reactants. Now the students don't have enough time to finish the lab. She blames herself that she should have checked for the materials before her class and then would have enough time to fix the problem.

### Lab Report from an Unfinished Lab

It was the first time in a general chemistry lab that the students had used Bunsen burners. At the beginning, Cathy kept saying she was scared of fire and could not finish the lab by herself. Her TA, Jenlie, told her she had to do the lab by herself, and finally persuaded Cathy to start, though she still seemed to lack confidence. After a while, Jenlie noticed another student, Simon, seemed to be helping Cathy set up the equipment. "That's nice of him," she thought. Without thinking too much, Jenlie went to other students who were asking for help. But when Jenlie went back to Cathy, Simon was still beside her, and there was no equipment in front of him. "Where is your equipment?" "Ehh. There." Simon pointed to a bench top on the other side of the room, where a group of students were busy collecting data. "You need to go back to yours and collect data. Okay?" Jenlie responded. Some other students were calling Jenlie again, so she left Cathy and Simon.

The third time Jenlie stopped at Cathy's bench, she had already collected most of the data she needed. But Simon was still there. Again she asked, "Where is your equipment?" "Ehh..." Now Jenlie suspected that Simon had not set up his own equipment at all. Because it was not a long lab, and many students had nearly finished their experiments, she told Simon, "Set up your own equipment now. You still have enough time to finish the experiment." "Hmm. Okay," he replied. At this moment, someone was calling Jenlie again. When she returned to Cathy's bench a moment later, Simon was gone. In fact he had left the lab.

Later, Jenlie counted the lab reports. Surprisingly, she found Simon's. Also, not surprisingly, his data and Cathy's were the same.

### **Last Minute Decision**

Professor Briggs, who supervises the CHEM-133 lab, requires all of his TAs to do each experiment ahead of time so that they know what is involved in each experiment and have an idea of the problems that might be encountered. The labs are never prepared before Monday morning, so in order to complete the experiment before her Monday afternoon section, Tori must come in Monday morning to complete the experiment. One Monday morning, Tori read over the procedure and found that 25mL volumetric flasks were required to do the experiment as written. However, none were available and the lab coordinator said they were not in stock. Clearly, there was there was not enough time to order 25mL volumetric flasks, Tori had to decide what to do so that her students could do the lab.

### **Late Again?**

Sam, an Organic Chemistry teaching assistant, carefully instructed his students about the day's lab. It involved significant safety precautions and attention to detail. Everything was going along as planned with the lab when Tammy, one of Sam's students, showed up two hours late for the three hour lab. She rushed in and said, "You wouldn't believe what happened. But there is no time to tell you now. Can you help me so I can hurry up and get started?" This was not the first time Tammy had been late. Previously, Sam had helped her and she was able to finish by the end of the period.

Sam hesitated as he thought to himself, "Even after teaching Tammy about all of the different safety precautions and if everything worked right, we would both still be an hour late getting out of lab. But this is the last lab session of the week and there is no way she could make up the lab. Is it my responsibility to go out of my way to help her out?" At the back of Sam's mind was the test he had the next day in Advanced Physical Organic Chemistry. He really didn't want to lose another hour of study time.

Impatient, Tammy asked, "What are you waiting for?" Sam said, "I know you will be disappointed, but it's too late. You can't do the experiment." Tears welled up in Tammy's eyes, "Please, please, let me do the lab."

### **Late Night**

The god who makes TA assignments is not omniscient as all TAs know when they learn their lab schedule and wonder when they will be able to have lunch on

Tuesday, or study for Wednesday exams. When Angela got her schedule, she wondered when she would sleep with two Monday labs, one of which was 7 – 10 in the evening. She also had classes that met at 8AM on Mondays and Tuesdays. With a hour and a half commute to her apartment each way, she wondered whether there was any point going home Monday nights.

Although Angela (an ISFJ) was shy, she wanted to be friendly and likeable to her students. Her labs went well throughout the semester, and she learned to connect with her students by sharing her own chemistry experiences. She felt she had grown close to her students. They felt comfortable coming to her to ask for academic and career advice.

Over time, Angela noticed that one of the students in her evening lab tended to work slowly and meticulously. Angela didn't have the heart to tell Mark to "hurry up," but he often wasn't finished by 10 PM. Because this was the last lab of the day, Mark felt no urgency to finish up and Angela felt obligated to let him work at his own pace. Ten minutes late turned into 30 minutes late, which turned into 45 minutes late. Mark's lab partners and friends started to hang around after lab as well because Angela had created a relaxed atmosphere. Though outwardly Angela was on her best behavior, inwardly she wondered if she would get any sleep, let alone have time to study for her 8AM class.

### **Late Night Study Session**

Polly Protic TAs for Dr. Earl N. Meyer's Chemistry 101 class. At the beginning of the semester, Dr. Meyer let her know that the evening before the exams, he wanted her to hold a review session from 6-10 pm. While Polly found this to be a little inconvenient, she agreed that she would hold the review sessions as planned.

The day of the first review session rolled around, and only a few students showed up at 6 pm. Polly asked Anna Litical, one of her students, whether she knew if anyone else was coming to the session. Anna replied that many students had a class until 7:30, and because of this Dr. Meyer had announced in class that day that Polly would stay later than 10:00, if students were still there and needed help.

Polly was annoyed to hear this, because Dr. Meyer had not mentioned anything like this to her. Sure enough, a flood of students arrived just after 7:30, and settled in to study and ask her questions. Many of them were still there at 10:00 and showed no sign of leaving. Polly was very tired, and she needed to complete an assignment for an 8:00 class the next morning. Over the objections of several students, she said, "That's the last question I have time for tonight."

### **Lazy Lab Partners**

"We are not in 3<sup>rd</sup> grade anymore so you won't be assigned seats," Kate the TA announced to her full section of introductory lab students on their first day. Lab sessions would proceed by working in pairs or groups of three, generally dictated by where a student was sitting. All of the experiments went well for the first few weeks and Kate was beginning to notice student behavior patterns. She knew it was important to make sure all students participated in activities even though they were working in groups. However, she anticipated that there would be at least one group that just wouldn't work well with each other.

One day after lab Kate was approached by Joanie who felt she was a member of that “one group”. Joanie said she didn’t think her partners were contributing enough to assignments and that it was affecting her grades. Being a month into the semester already, Joanie realized that other groups were already settled. She didn’t want to appear rude to the students she was trying to leave. Nevertheless, she asked Kate to put her in another group.

### **Leaping Lizard**

Olga came to this country 2 years ago and felt comfortable with the language, but she was afraid that kids won’t accept the authority of an international TA. Her worries began to fade after several weeks. For the “respiration lab”, the students were supposed to take a lizard or a mouse, put it in a closed chamber and measure its respiration rate. The lizard part seemed to be easy—they just needed to dump the lizard from one chamber to another without even touching it. It was the mouse part that Nadia was expecting to become a challenge.

At the beginning of the lab Olga explained the basics of animal handling, briefly showed the tubes with the lizards, and focused on the students working with mice. To her great relief, picking up and imprisoning of mice went surprisingly smooth. She was very happy, but suddenly heard shouts from the back of the room. Somehow (most likely intentionally) the group of her usual trouble-makers managed to set the lizard free. It jumped out and hid under some equipment with only its tail sticking out. The whole class got very excited and gathered around Olga and the lizard. Some students wanted to help catch the lizard, but the majority was just curious to see if Olga would try to fish it out. Several of them even started betting whether she would break its precious tail. With the excitement, things were getting a little out of hand and Olga wasn’t sure what she should do. If she tried to catch the lizard and failed, pandemonium would ensue with a lizard on the loose. On the other hand, she really couldn’t ignore the situation and go on with the lesson.

### **Let it be?**

Arleen had a great relationship with the students in her biology lab. They were not only bright, but very open and honest sharing with her their feelings about the course. Consequently, she learned many things that the course instructor would only find out about if he happened to read the course evaluations after the semester was over. While proctoring an hour exam for her students’ lecture course, she felt some of the exam questions were a little confusing or ambiguous, but reasoned she might not understand the questions because she hadn’t attended any lectures. She figured that students who had attended class regularly would have no trouble answering the questions.

At her next lab, Arleen solicited some feedback about the exam and lectures overall, which resulted in a avalanche of complaints. Many students in both of her sections agreed that the professor seemed unapproachable, difficult, and unwilling to answer questions about hard-to-understand topics. Arleen wanted to relay the students’ feelings to the professor in a respectful manner without making her class seem whiny or antagonizing him, but decided that that was not her job.

### **License Expired**

Eva Louise Schan had become pretty comfortable with her TA position in Introductory Biology. Her confidence grew with each little problem she had dealt with on her own. It was now the beginning of her second semester. The plan for the day was to give the standard safety presentation and then have the class perform a computer simulation on acquired mutations in populations over time.

Eva Lou finished the safety presentation and told the students to open up the computer program. Within minutes, each of the lab groups discovered that the one-year program license had expired the day before and they could not access the program. Quickly, Eva Lou found the phone numbers for the lab supervisor and the course instructor in the lab manual. Unfortunately, neither answered.

The students were getting impatient. “Since we can’t use the computer program, why can’t we just leave and get credit for showing up?” Eva Lou would have nothing of it. She responded a bit testily, “If you could just be patient while I find someone to help, I would really appreciate it. Take this time to get to know your lab partners and discuss the concepts highlighted in your lab manual for this experiment.”

### **Life and Death Situation**

Lab had been going well. One day a student, Bill, arrived rather distressed. He asked his TA if they could talk privately in the hallway. He was clearly on the verge of tears and quickly revealed that he had just received a text message that his depressed friend said she is going to kill herself. He tells you that she has had problems like this in the past.

### **Lights Out**

Michelle walked to the chemistry library where she was to meet her student, Brian, for a make-up quiz. Upon arriving, she discovered that the library was completely full. Hoping to find an empty classroom, Michelle and Brian walked around the second and first floor of the chemistry building, peering into every room. All of the classrooms were full as well, so Michelle told Brian that they may have to use the T. A. communal office. She warned him that there would probably be a lot of noise there because the first year TAs were quite talkative, but Brian said he didn’t mind and could take his quiz wherever it was most convenient.

They headed into the T. A. office and Michelle set Brian up with his quiz at the desk next to her. As expected, a bunch of TAs were hanging around chatting, and while Brian never complained, Michelle worried that his performance on the quiz might be affected by all of the distractions.

After about 15 minutes, Michelle started hearing heavy, slow breathing from the desk next to her. She glanced over at Brian, who appeared to be hunched over his quiz, but wasn’t moving. Several minutes passed and the heavy breathing turned into snoring-- Brian had definitely fallen asleep! Michelle looked at the clock and noted that he only had seven more minutes to finish his quiz.

### **Locked Out**

As Sarah was tidying up the lab after her last lab of the week, she noticed a flash drive sticking out of a computer. Attached were keys, which she assumed must be for a car or dorm room. She had an idea the keys belonged to Peter. The only remaining student in the lab did not have a cell phone number for Peter, so Sarah wondered how she could return the keys since she was leaving town for the weekend. She decided to give the keys and flash drive to Aldous, the TA in the lab next door because he had a lab section in the next period and Peter might come back. Sarah sent an e-mail message to Peter and left a note on the lab door saying Aldous next door had his keys. Saturday, 100 miles away, Sarah checked her e-mail. She had a message from Peter informing her he was locked out of his apartment, couldn't find Aldous, and needed her help to get his keys back.

### **Loose-leaf Effort**

At the first weekly meeting of his microbiology labs, Anthony discussed the importance for all students to have the current semester's edition of the laboratory manual, because it is regularly changed. His supervisor told him that students occasionally attempt to get by with outdated manuals and to look out for them. About four weeks into the semester, his students turned in lab reports completed on forms from the manual. While grading, Anthony noticed that one of his better students, Clarissa, only partially answered a question and that part of her instructions were missing--Clarissa was using an older manual. The following week, he pulled her aside as she was leaving: "You know, you really need this semester's lab manual, changes are made every year, and you'll be at a disadvantage without the correct one." She said she understood.

Several weeks later, Anthony noticed that Clarissa was recording her data on loose-leaf transcripts of the lab manual forms. He reminded her again that students must have the current manual, and she acknowledged his message, but when his students turned in their final five lab reports, Anthony found that Clarissa had turned in all of them entirely on loose-leaf paper. She had done a fine job with them, but they were not completed on actual lab manual forms. Anthony understood that the microbiology lab course operates under strict grading policies, and he wanted to grade with fairness to all his students and with continuity to the course, instructors, and other TAs.

### **Lost Backpack**

The evening before class, Bret got an email from Jeff saying that he couldn't do his lab report, which was due the next day. Jeff said he lost his book bag at rowing practice. Bret told him to get his data from his group the next day and turn in his report one day late, with 10% grade penalty. The next day Jeff said that his group did not have their data with them, and that they wouldn't be home tonight to email it to him. Bret then gave Jeff another extension. After class, the group came up to Bret and told him that they had kept the data from Jeff because he was studying for a chemistry test the week before and had not worked with the group. They were angered by Jeff's selfish actions and thought that he should not get to represent their data as his. Having now understood the situation, Bret then emailed the Jeff and told him he would not be able to turn in the assignment because he would have no data to write a results section.

### Lost Control

The Instrumental Methods laboratory is an upper level analytical chemistry course designed to teach the student how to perform chemical analysis by several types of spectroscopy. During one of the labs, near the end of their analysis, Gabrielle asked the TA, “Hey Pascal, are we supposed to analyze a sample of the solvent matrix? It’s not mentioned in the experimental procedure.” Pascal smiled and replied, “What do you think? Gabrielle thought, “I have enough data,” and decided to leave on time. Marie, who had overheard the exchange, went back to the lab bench and prepared a blank sample of the matrix for analysis.

Six days later Gabrielle was working late to finish her lab report. While looking at the experimental data, she notices an extra peak in each of the chromatograms. Confused about the data, she e-mails Pascal for help at 11 PM.

### Lost in Translation

Grace adopted an English nickname because students had trouble pronouncing her real Chinese name. She thought it was important to have a good relationship with her students, so she worked hard to make that happen. She tried to understand every question and patiently answer as clearly as she could. In her mind she identified three kinds of students in her lab sections—some preferred to solve problems by themselves and never asked her questions, some liked to work with other students and would occasionally ask questions when they got stuck, and then there were those who seemed to deluge her with questions before trying to figure out an answer.

One day a Pete came to ask Grace some questions, which were not hard to answer. After she gave him the answers, he just said, "Actually I know the answers to the questions, and I just wanna “text” you!" She started to laugh. “Why would he want to text her?” It was so funny.

Afterwards she thought that maybe he was curious about her background. Whatever the reason, it was another way for her to communicate with Pete, if that was what he wanted. She continued to answer Pete’s questions in lab, but to her puzzlement, Pete never sent her a text message.

### Lost to Lab Pass

The chemistry lab course Zeppo TAs has the policy that students can attend a another lab section at a different time if they can’t attend their regular lab. Normally students need good reasons to get a lab pass to attend another section. But since it was easy for students to transfer labs, some took advantage of it and attended labs with their friends or ones taught by TAs they liked.

Being a new international TA, Zeppo felt a bit nervous about teaching labs where he had to deal with all the problems and be in control of a class for the first time. Although he worked hard, he could not perform as well as he wanted. Even when he tried to explain things he understood well, he couldn’t get all the students’ attention or get them to understand. Student attendance dropped in his lab because some students arranged Lab Passes. In addition, Zeppo overheard students complain about being lost in

his lab section. Although students may have good reasons to attend another section once in a while, he worried that he was the reason.

### **Luck of the Draw**

Ginny couldn't believe it. She came to graduate school to be an organic chemist. So why was did she have to be a teaching assistant a physical chemistry lab? "This is ridiculous," she thought. "I was terrible as an undergraduate in P-Chem and I hate calculus. Even if I wanted this lab, it would be a disaster for the students." She soon learned that there weren't enough graduate students interested in physical chemistry to supervise all the P-Chem labs but there were extra organic chemistry graduate students. It was the luck of the draw that she got the assignment because it fit her schedule. When she casually complained to Prof. Sherman, who had made the assignments, and implied that there must be others better suited for the assignment, she didn't get much sympathy. He said, "You're a chemist first, not an organic chemist. You should be able to deal with any undergraduate lab. Think of it as an opportunity." To herself Ginny thought, "Opportunity! Baloney. This is going go be a long semester. Maybe I came to the wrong graduate program."

### **Mad Grandma**

It was the first time for Jake as a TA. He tried to feel ready and comfortable as he prepared for the lab. The students were energetic and it was hard for them to concentrate on what was going on. After a while, some of them started complaining about why the labs lasted 3 hours and why they had to fill out lab reports by the end of the lab. When Jake saw Greg pick up his stuff and leave the lab in the middle without turning in his lab report, he was unsure about what to do. He ran after Greg and caught him in the hall as he was putting on his coat to leave.

Jake asked, "Why are you leaving? You haven't finished yet?!" Greg responded, "I need to get my grandmother at the hospital and take her home. She is waiting for me now." Jake was a little suspicious when he asked, "If that is so, Why didn't you tell me that before class? You haven't finished yet and need to turn in your lab report before you leave." Greg was insistent when he replied, "I can't. She is waiting and will be upset if I don't come on time." Jake retorted, "But you knew that lab goes until 6:30. Why don't you just give her a call and tell her you're sorry, but you are running late. This is not an emergency. She can wait an hour. Finish the lab quickly and I will let you go." Reluctantly, Greg returned to the lab and grumbled under his breath, "Okay, but Grandma, will be PO'ed at you." Greg did not make a phone call and didn't seem to be in much of a hurry when he finally did leave the lab with several other students.

At the end of the day, Jake felt success for having averted a departure that could have establish a bad precedent for the rest of the semester. Nevertheless, he wondered whether the opposite would have been true if Greg really did need to pick up his grandmother.

### **Made for TV Drama**

Throughout the semester, TA Jim had been friendly with his students. He had the Friday 7-10 pm lab, and had been invited repeatedly to go out afterwards with his students to the bars. He had always said “no”.

On the final day of lab, two of his students, Michael and Ryan, asked again if Jim would come out with them and celebrate the end of the semester. Michael stated, “C’mon Jim, we’ve had a great time with you as our TA. Let’s go out in style.”

“I can’t,” Jim said, “it’s a conflict of interest. If I get caught with you guys, I could lose a lot.”

“How so?” Ryan asked, “It’s the last lab. You can mark our lab reports before we head out. We’ll even buy the first few rounds. Plus, I know Pam is going to be out with us. You know she has a little crush on you, right? Ever wonder why she asks you so many questions? She hasn’t been able to keep her eyes off you for the entire semester. Prof. Schrute will never know that you’ll went out with us.”

### **Magical Mystery Lab**

It was a cold drafty afternoon in the basement of Hudson Lab. After his initial head count and thorough inspection of attendance, Jim noticed that one of his students, Sally, was absent. Not thinking much of it at the time, Jim continued on with his routine pre-lab lecture and guiding his students through their chemistry experiment. For the most part the lab ran smoothly, students got their labs done early that day and scampered out the door.

When Jim returned to his office to grade the labs that he had collected that day he noticed something strange. Sally, who had been absent that day, had somehow completed the lab and turned it in. Perplexed by this discovery, Jim e-mailed the Sally inquiring about the lab that she had magically completed and turned in. He also reminded her of her academic responsibilities and stated not only the consequences for her, but also the consequences that would befall the other student who must have been involved.

Of course, the response was a heartfelt apology for the academic dishonesty that had taken place. Sally pleaded with Jim that she didn’t know that such repercussions would come from such an act. Jim reflected on the apparent sincerity of the e-mail he received and replied with this statement...

### **Makeup Mess**

In Susan’s analytical chemistry lab, Bob missed class because he was sick, an excused absence. Susan emailed Bob that she could arrange for him to make up the lab during the same week, if he would send her his schedule. Unfortunately, Bob forgot to give her his schedule in time and the next lab activity had started. Bob talked to Susan about making up the lab. Susan thought there might be chemicals left over from the last week enough for him to make up the lab, so Susan suggested that Bob to do the lab on next Friday much to Bob’s relief. However, when Susan and Bob were going to do the lab on Friday, they found the chemicals had been exhausted. Susan went to the professor

to ask if there was more for Bob's lab, but the professor said they had no chemicals about this lab and this student should have do the lab last week of the semester. Susan was a little disappointed and had to tell Bob that would have to wait to make up the lab.

### **Making Labs Work**

The word was out from the experienced TAs that this week's lab never works. Sure enough, the Monday labs were a bust and the students were sent home with a set of data from another year to analyze. The night before Gordon's first lab of the week, he decided to try out the lab for himself and discovered that it worked fine provided one paid attention to a seemingly unimportant instruction. Much to his surprise, several students in his lab the next day showed up late and asked if they could get the data to analyze. They said they heard that the lab was cancelled. Later Gordon discovered that some of the other TAs had in fact cancelled their labs. Furthermore, they chided him for his efforts to make the lab work.

### **Making Points with Points**

Tina, a TA for an honors biology lab, reviews the requirements for every lab assignments and encourages her students to come to her office hours with any questions or concerns. Ellen, a motivated student, often came to office hours to go over the post-lab assignment before the due date. Tina would go over major corrections and make her expectations as clear as possible. More than a month into the semester, she still went over common mistakes with her students to prevent them from losing points. Students, including Ellen, often neglected to cite information from outside sources. Tina started deducting a few points from the lab reports for this omission.

Ellen was especially upset over her grade. She argued with Tina in front of the entire class and she thought that by showing Tina the assignment ahead of time, this mistake should have been pointed out to her earlier. Tina tried to explain to her that non-common knowledge must be cited, but Ellen continued to dispute the grade and was disrupting the lab. Tina asked Ellen to see her after class to resolve the problem. However, Ellen remained distracted and was unengaged with her group for the remainder of the lab period.

### **Managing the Lab**

Dr. Jekyll is a professor in charge of an advance chemistry lab. The students in the lab are usually juniors and seniors. The lab requires the students to write formal lab reports similar in style to a journal article. The students will have a chance to re-write the first lab report. However, Dr. Jekyll has a reputation among the students for being an excessively tough grader.

Because Dr. Jekyll grades the first lab by himself, the lab reports aren't available to be returned to the students until almost 3 weeks after they were turned in. When John, the TA, returned the lab reports there was the usual grumbling. The grades weren't very good, but the opportunity to improve them with the re-write existed. After addressing the questions about the re-write and calming the minor grumbles, John was ready to start the lab. However he noticed that Laurie, one of the students was missing.

John talked to her lab partners and found out that Laurie had left the lab and was in the ladies restroom crying. She only received 40 out of a possible 100 points after spending 15 hours working on the report. Now John has to figure out how to get her out of the restroom, calmed down and ready to work today without delaying the other students unnecessarily.

### **Marching to Different Drummers**

Because the largest lecture hall on campus seats a maximum of 300 students and more than 1000 students take CHEM-I each fall, different professors taught different lecture sections of the course. While they at least agreed on a common textbook, their backgrounds, interests, expectations, and pedagogical styles differed greatly. Not surprisingly, students, many of whom were roommates or friends, simultaneously took CHEM-I with different professors and compared notes. Some students were quite sensitive to these differences, particularly when they felt they had a tougher time and were getting a lower grade as a consequence.

Although the laboratories used the same experiments for all sections, sometimes the students from different sections would have different procedures and different methods for the same experiment. Students quickly found out which ones were more advanced and superior. They complained to their TAs, "Why can't we use the computer-based procedures?" "Can we use the CBLs and the light probes?" The stock answer from the TA was, "Your professor does not require this. That's for other professor's students." But the students were not satisfied and the TAs felt caught in the middle because they had to take flak from the students that was meant for the professors.

### **Mean Grader**

In Bruce Li's lab sections, there are several students who always dispute their grades. These students call Bruce a "mean" grader. One day, Jack, one of Bruce's student, argued with him, " You told me that my answer was right last week, why did you give me zero for this problem?" Bruce looked at his reports and the answer was totally wrong. Bruce really could not remember whether he had told Jack that his answer was right or not. So he told Jack that maybe he just confirmed his formula " $M_a V_a = M_b V_b$ " was right but Jack didn't know which number is  $M_a$  or which is  $M_b$ . And this problem is only 2 points, there is no way to give him partial points for this formula because it was Bruce who wrote this formula on the board and told them that's the way to solve that problem. Jack kept arguing with Bruce that he had told him his answer was right...There are several students waiting for Bruce to help them on the current lab, Bruce had to say, "I don't want talk with you about this issue anymore." Jack became angry.

### **Medical Emergency**

Betsy had showed her students how to insert a glass tube through a stopper and had warned them that they needed to be careful. However, her warning went unheeded. JoAnne, a first semester nutrition major, broke a tube and it sliced through the skin between her thumb and index finger. Blood was all over the place and JoAnne panicked.

Her lab partner Gretchen contributed to the problem by screaming hysterically for Betsy to call the ambulance.

### Missing Data

While grading her biology lab's final lab reports, Allison, was pleased with how much her students had improved since their first assignments. The last report she graded was from Alana. It totally confused her. The report was supposed to be about an experiment that the students had designed within their groups. Alana's introduction was on the experiment that her group had designed, the results section was on a completely different experiment that hadn't been done in her lab section, and the discussion section was on a third experiment that also hadn't been done in her lab section.

Allison asked Alana about why she didn't use the data that her group had collected. She replied "I didn't write the data down in lab so I just used my friend's numbers. I didn't know that you kept track of what we're doing". Allison knew that technically this was academic dishonesty, but she was hesitant to tell the course professor because she didn't want to get a student in trouble for something that may not be a serious offense. On the other hand, Allison was unsure of how to grade the lab report and she wanted the professor's advice on how to grade.

### Missing Grades

Tragedy struck unexpectedly when a popular instructor of general chemistry died suddenly in the middle of the semester. With hundreds of students and many TAs involved, things were chaotic. No one could find the grades for the first part of the semester. Students were asked to bring in their graded tests and homework to be rerecorded by their TAs in lab. Several of Lin's students claimed they had not picked up their tests and had no idea what their scores were, yet those exams were not among those in the pile of unclaimed exams. The situation was even more complicated because of holidays and a storm-related cancelling of classes for several days. Lin figured that other TAs had the same dilemma and turned in the grade sheet with blanks for a few of his students, but he suspected they were taking advantage of the situation and wondered if there might have been a creative way get students to reveal their scores.

### Missing Key

Taylor, a first-time graduate TA, had acquired a reputation for losing things and then discovering them later. He had left his bank card in the ATM machine by accident. Stuck among papers in the sleeve of his notebook, he found an important letter he was sure he had sent home two weeks before. Slips of paper with phone numbers and addresses regularly went missing. Thus it was a source of amusement to the other TAs when Taylor began shuffling through the stack of papers on his desk and repeated the process several times.

"What are you looking for *this time*?" asked Rachel. "Oh, nothing really. I am sure it's here somewhere. It's gotta be." Persisting, Rachel asked, "What's 'it'?" Taylor responded, "The answer key to the prelabs and the workshops. I need it for my lab this afternoon. Can I borrow yours, if I can't find mine?" "No way!" Rachel barked. "We were

told at the beginning of the semester not to share these with anyone and never to bring them to lab where they might disappear in someone's book bag." The comment was like a bolt of lightning. Taylor had brought the answer key to his lab last week and he couldn't remember seeing it since.

For several days, Taylor looked everywhere, but he never found the missing answer key.

### **Missing Student**

Scott, a first year graduate student, is new to teaching. The semester started off splendidly without any major issues. One of Scott's students, Jim, is a non-major student that is taking the course to fulfill a core requirement. He is a very conscientious student who has never been absent and always turned in his work on time.

A few weeks before the end of the semester, Jim missed a lab. Scott is worried because he had not received an e-mail from Jim letting him know that he was not going to make it to lab and needed to make it up. This was not usual behavior for Jim. It is class policy that for each of the first two labs missed, that the final grade be docked five percent, and with a third absence, the student will fail the course. Scott contacted Dr. Bloom, the primary instructor, and asked, "Have you heard anything about Jim? He did not show again in lab today." "No, I have not, but I am sure if there were something serious, I would have been told," replied Dr. Bloom. "Besides, it is enough to worry about student in class without worrying about their lives outside of class."

Somehow, Scott was not comfortable with Dr. Bloom's answer. He felt that something was wrong, because it was out of character for Jim to be absent and not let someone know. The following two weeks, Jim missed his second and third labs in a row, which meant failure in the course. Scott had yet to get an e-mail response from Jim.

### **Missing the Grade**

Grades from full lab reports were a significant part of a student's lab grade in biology. Stew stayed up into the early morning several nights in a row to finish grading these assignments. Unfortunately, it was hectic week for Stew. He was swamped with presentations and tests and was too tired to record the lab report grades before he went to bed. The next day he slept in and headed to his lab and totally forgot to record the grades in his computer before leaving his apartment. On his way to school, Stew made a mental note to record the grades on a piece of paper before returning the lab reports to the students.

He arrived to lab just in time to get set up before letting in the students. As he got started with the lab and began fielding questions from the students, he forgot all about recording the grades for the lab report. As the lab went on students would finish and ask to leave. Stew checked their work and, before allowing them to leave early, returned their lab reports. Toward the end of lab Stew suddenly realized that he had not recorded any of the grades and he had already returned the lab reports to almost all the students in the class, without recording a single one.

### **Missing the Point**

Barb worked really hard at being a TA. She prepared ahead of time, understood the point of each experiment, and thought about how she could help students get the point in a way that they would remember. In chemistry, the idea of a limiting reagent seems so obvious to those who understand, but somehow students always seem to have difficulty with it.

As Barb explained clearly in her prelab discussion, “When two reactants, A and B, combine in a one-to-one molar ratio to form an insoluble product C, any excess of A or B will remain in solution. The reactant that was used up in the reaction is the limiting reagent. You can determine whether A or B was the limiting reagent by testing the filtrate to see which of the two causes more precipitate to form.” In addition, Barb had students fill out a work sheet and do sample calculations.

Jasmine and Jess were lab partners who were serious students and paid attention to procedural details. They followed the directions for the limiting reagent experiment perfectly. Their results indicated to Barb that A in the experiment was the limiting reagent, yet Jasmine and Jill proceeded to do all of their calculations as if B were the limiting reagent. Barb couldn't imagine how they could do the whole experiment correctly and then reveal they didn't understand what a limiting reagent was.

### **Misunderstanding?**

Maki, an international student and first-time TA whose first language isn't English, TAs an organic chemistry lab for non-majors. These students are not particularly interested in chemistry and have to work hard to understand Maki's fluent, but accented, English. One day during TA meeting, Prof. Bigalow told Maki that a student in her Sunday afternoon lab had complained to him, that he could not understand what's going in lab due to Maki's accent. Maki later learned that it was Stewie who made the complaint.

Stewie missed the fifth week of lab and was turning in a lab report to Maki in the sixth week. He told Maki he was waiting for Prof. Bigalow to give him excused absence for the missed lab last week and that Maki should accept his report. Maki told Stewie to hold on to his lab report because she needed to hear from Prof. Bigalow about Stewie's excused absence. Stewie again complained to Prof. Bigalow that Maki didn't understand him due to a language barrier, and that was the reason he could not turn in lab report for the experiment that he missed.

### **Monday ...Not so Fun Day**

Chris was a TA for three sections of a general chemistry lab. His two Tuesday lab sections consisted of students who had lecture with professors at the state university, and as the semester progressed, the labs seemed to run more smoothly each week. However, Chris's third lab section was on Monday nights, and consisted entirely of students who attended a technical community college about an hour away. Just a few weeks into the semester made it clear that the Monday students were not on the same level as the students in his other lab sections. Many were unmotivated and just wanted to get finished with the labs as fast as

possible, and so their grades were consistently well-below the other sections. Despite receiving weekly emails and notifications reminding them of the assignments and readings to complete before lab, the students would arrive unprepared and clueless about the experiments they were to perform. Every week, what started as a discussion about the lab procedure and calculations would turn into a discourse of the students complaining about their professor not having taught the material ahead of time. Chris began to dread coming to lab on Mondays.

### **More Time?**

Part of Wayne's responsibility as a TA was to proctor examinations. He and another TA were proctoring a midterm chemistry examination in one of several rooms. The students were given one hour to complete the examination. However, at the end of the hour, only three students had handed in the exam. Most of the other students had not even started some questions. Clearly the examination was challenging and required thinking, but the new professor who wrote the exam had made it too hard for the time available. When Wayne asked for the students to turn in their exams, one of the students said, "Can you give me a just few more minutes because I know how to answer a question, but I just haven't had time to finish it." Several other students expressed their agreement. The exam was 30% of the grade for the whole semester, so Wayne relented and didn't collect all the tests at 1 hour. He gave them another 15 minutes and then collected the exams.

When Wayne took the tests back to the professor's office, a group of TAs, who also had proctored the exam, were gathered in the hall discussing how long the exam was and how bitterly the students complained when the exams had to be turned in at one hour. Wayne decided not to mention that he had given his sections extra time to finish the exam and show what they really knew.

### **Mystery of the Missing Base**

Bob was a TA in CHEM-247, Quantitative Chemistry. He couldn't explain the results his students were getting and it was driving him (and the students) nuts. On Monday the molarity determined by the students for the stock NaOH was  $0.378 \pm 0.005$  M. The students in his Tuesday lab got different numbers,  $0.321 \pm 0.007$  M, and on Thursday, they were getting lower numbers yet from the same carboy of NaOH.

### **Negative Control**

A few days before their lab reports were due, a worried student sent an email message to Cary, her TA. Gertrude explained that while the rest of the procedure for the experiment had gone great, her group omitted a step in the procedure because they overheard Cary telling another group that procedural step has not been working. What she failed to realize was that step was not supposed to work. The students were performing SN2 substitutions using different reactions conditions to test the limitations of the chemistry. The conditions Gertrude's group omitted were the conditions designed to not work, allowing the students to experimentally confirm what they have been taught in lecture. Now Gertrude is concerned because she does not want to lose points for omitting

the procedure from her experimental section of the lab write-up. “We knew it wouldn’t work. Seriously, why can’t we just include the procedure as if we had done it?”

### **Never Ending Experiment**

This was a lab the students were excited about. They would analyze their own DNA. The procedure was easy to follow and the 2 hour lab time was enough to get an experiment done. Simon had set a time frame for students to follow. The students loaded the gel with their samples and started the electrophoresis experiment at the end of one hour just like Simon wanted.

Simon had told the students to turn on the electrophoresis units after they finished loading by turning on the run button at the bottom. Because nobody did it, Simon himself turned it on and went to discuss the experiment. After about 30 min Simon returned to the lab to check. He was shocked to see that the electrophoresis unit was turned off. The DNA had not even run a single centimeter on the gel. He panicked and didn’t know what to do. There was not enough time to run the gel any further as the experiment would not end and disturb the next lab. Simon was guilty. All the excitement students had would go in vain because “Somebody” had turned off the electrophoresis unit.

### **New Course Design**

It seemed like Prof. Pincus had taught CHEM 275 forever. It was his course that had been honed to perfection. However, it was time for new blood and the reins were handed over to Prof. Aston, a new assistant professor. Because the course was so effective and he didn’t have the desire to rewrite the labs, Prof. Aston decided to keep the lab experiments and materials developed by Prof. Pincus. However, he did decide to adopt a widely-acclaimed new text book for the lecture part of the course.

What Dr. Aston didn’t realize is that the sequence of topics in the original textbook were in phase with the sequence of experiments in lab. While the new textbook was excellent, the order of topics was changed slightly. Prof. Aston nor his cadre of TAs were prepared when the material in one of the labs came up four weeks before it would be dealt with in the lecture.

John and the other TAs just about freaked out at the weekly TA meeting when Prof. Aston said, “What makes you think that concepts always have to be covered in the lecture first? At some schools they have what is called Discovery Learning laboratories in which the students learn concepts by doing experiments and discovering the concepts in lab first. It seems to me that this is a great learning opportunity.”

John raised his hand and asked, “Discovery Learning may be great, but I wasn’t taught that way, and I really have no idea what I am supposed to do tomorrow when I have my lab.”

### **Nice Goggles**

TA Tina was a teaching a room full of undergrads for the first time. She wanted the students to find her approachable and friendly so she would occasionally joke around with them. One student, Bert, may have taken her demeanor the wrong way. It started off

with him asking her age and what bars she went to. He then told her that she looked good in her safety goggles and asked if she decided to come to Delaware because he went there. Tina did not acknowledge his comments. He made these remarks in front of his fellow students and she did not want to embarrass him by calling him out in front of them.

### **Nine-One-One**

What a way to start the semester! It was Albert's very first lab as a TA. While his students watched the mandatory safety video, he ducked out into the hallway for a quick drink of water from the drinking fountain. He wasn't the only TA in the hall. Han, the TA in the lab next door, was on the red emergency phone desperately trying to describe the situation and location with the 911 dispatcher on the other end. Though Han was fluent in English, the emergency operator was having difficulty understanding his accent.

Recognizing that there was a serious problem, Albert got Han's attention and asked, "What's wrong?" Han pointed repeatedly to his lab while continuing to talk on the phone. When Albert entered Han's lab, he discovered a disorganized group of students crowded around a motionless student. She had passed out and had hit her head on the sink as she fell to the floor. The pool of blood around her head and a hysterical classmate required quick action.

### **No Goggles, No Lab**

At the first lab week of this semester, a few students in every section forget to bring goggles. Typically they say they live in a remote dorm and ask to borrow the spare goggles in the prep room, just like what the other TA did for their students. Beverly lent those goggles to her students and collected them back by the end of the lab. However, the same situation kept happening. Three weeks later, she found there were no spare goggles in the preparation room, because other TAs forgot to retrieve them. One girl forgot to bring goggles that week. Beverly told her, "Tough luck. You have to get your goggles, otherwise I cannot let you step in the lab." The student ran back to her dorm in 20 minutes in the rain and was able to complete the lab on time. After that, students ever forgot to bring goggles to lab room.

### **No Joke**

Mary, an international TA in a general chemistry class, is outgoing and enjoys talking with people. Before she began teaching, several people advised her that TAs need to be strict and not too friendly, otherwise students will take advantage of them and create class management problems. Mary decided to follow this advice and avoid casual talk. She focused on lab activities.

At the first lab meeting, many students were curious about the class, the TA, and if they knew anyone in the class. Several times they joked with each other and with Mary, but Mary, being cautious, wanted to become a strict teacher. She just kept going and pretended to not hear the joke. Several weeks later, Mary found that the students concentrated more on their experiments and didn't joke with her any more. She also found that they didn't communicate with her. When Mary was doing the prelab demo, most of them just looked at their own manual. Mary felt that the students disliked her. So she asked Zach, one of her students, "Why don't you listen to me during the demo? Do

all of you understand the whole process?” Zach answered, “No, we were somewhat confused, but we didn’t feel free to ask you because you always seem so serious and not so easy-going.” Mary decided that simply being strict is not a good way to teach and that she would be more relaxed for the rest of the semester.

### **No More Unknowns**

Tim was a pretty laid back TA, caring more that the students understood the lab rather than them getting outstanding experimental results. However, Tim did have a few rules. For example, for each unknown assigned to a group, each student must remove a hand written label and place it on his or her lab report.

One week two students, Jim and John, came in late. They were given an unknown, told to work together, and to ask other lab mates to help them catch up. When lab were collected at the end of the period, Tim noticed that Jim and John had not put the label of the unknown given to them on their report, instead they had copied the unknown number and data from the group across from them. When Tim brought this up to the professor in the next TA meeting, he was assured that the students would be dealt with.

Later that day Tim received an e-mail from the professor informing him that Jim and John claim that they were instructed to copy from another group because there were no unknowns left. Tim knew this was not the case as he had prepared enough unknowns for 24 students, and there were only 18 students in the class.

### **No Second Chance**

Eva was very nervous and at the same time excited about being a TA for the first time. She wanted to be a role model to her students in terms of discipline. On the first day of lab, she made she clearly laid out the University’s policy on plagiarism and rules for writing reports. Later when students submitted their first lab report, she realized that three of her students submitted the exact same reports. She was very upset and disappointed about this because one of the students was the best student in her lab.

This was the first time as a TA she had to deal with cheating. Should she handle the situation herself or report the incident to the professor? After thinking for couple of days, she decided to report the incident to the professor. After hearing and conforming that the students were indeed submitted exact same reports, the professor decided to report to the Judicial Affairs Office, which surprised Eva. She expected the professor to give the students a strict warning so that they wouldn’t copy again. But now it was out of her hands and the students had to go through this entire painful and embarrassing process of explaining their story in front of the committee of Judicial Affairs. With this entire series of events Eva started questioning her decision to take things to the professor without even giving the students a chance to tell their story. She thought she should have talked to the students and given them a warning as it was their first mistake.

### **Nobel Prize for Patience**

It was 12.30 Friday afternoon. Sammy was getting ready for the weekly interminable TA meeting. They took bets on whether this would be the first meeting to end on time. At 1:05 Dr. Penny hadn't arrived yet. "Where is Dr. Penny?," Sammy asked, as if anyone would know. "This is ridiculous," complained Chuck. "We haven't even got the lab procedures for this week. What are we suppose to do?"

Eventually, Dr. Penny came like a wind and sat in his usual place. "Sorry I'm late guys. I had a meeting." "His usual excuse," Sammy thought. "If we were late to the lab, he'd be angry and make us come early. That's not fair."

"Let's get started guys, but give me five minutes, I have to finish writing the lab procedure. I'll send that to students and get you copies," Dr. Penny said. "The next lab is about IR analysis, so why don't you play around with the instrument and get an idea of how it works while I go and get printouts for you."

As the TAs tried to find out about the operating procedure, Chuck said, "Oh no, there he goes again. Two bits he won't be back for half an hour." Chuck almost lost his bet. Dr. Penny returned 28 minutes later with the printouts and all started to work through the experiment. As Dr. Penny started to explain the instrument, Sammy thought everything was fine and that they still might finish the meeting on time when Dr. Penny stopped suddenly, "Oh my gosh, I have a meeting at 2:00 with the Chairman. That's alright. He can wait a few minutes. Let's finish this." And he went on with the explanation. But his electronic diary beeper kept on reminding him of the meeting time. Dr. Penny wanted to go but he tried to finish the explanations. Then they found out that the printer was missing and CO<sub>2</sub> purging machine was not working. With that, Dr. Penny asked Chuck, "Can you go to the electronic shop and find a person to fix this? Meanwhile I'll go to my meeting. See you later." Dejectedly, Sammy said to Chuck, "Lucky there's a seminar at 4:00, otherwise we'd be here all night!"

### **Not Another Fire!**

Gretchen proceeded to follow directions and held her test tube over the Bunsen Burner with a test tube holder. As instructed, she had her goggles on and pointed the open end of the test tube away from herself and others so that if it bumped, no one would get hurt. As she waited for the reaction to go to completion, the test tube holder was getting too hot for her hands, so she wrapped a paper towel around the handle for insulation and continued. Before she knew what was happening, the towel caught fire, she dropped everything, the test tube broke, and her lab notebooks was catching on fire. "FIRE!", she cried.

### **Notebook Woes**

Bob is a TA for a Sophomore Organic Chemistry lab. In order to complete each lab, the students simply supply a conclusion section to their notebooks and pass it in after the lab. After two weeks the Bob noticed that the conclusions were hastily written, mostly due to the students rushing to get home after a long lab. In order to give them time to think about their conclusions and write them up more carefully, he let the students pass in their notebooks sometime within the following two days. Some notebooks improve, others stay the same. George, a student who attends every lab and performs competently; stops handing in his lab book entirely.

When Bob asked George if he had a problem, George said he is a part-time returning student taking mostly night classes because of his work schedule. He said he has a hard time getting to campus during the day. Bob told George he could hand in the notebook at the end of class like he did before. He also informed George know that without the notebook he is currently failing the lab. However, if George could show him his notebook in lab the following week, he could make up some points. George does not bring in his notebook.

### **Novel Solution**

The students in Jackie's second lab left a royal mess. Multiple racks of dirty test tubes were stacked haphazardly in the back of the lab and in the hood. Needless to say, Jackie was not at all excited about the prospect of cleaning up after her students to get ready for her next lab the following period. Although she was tired and out of patience when her last lab section came in, she had an inspiration. Rather than for her to clean all the test tubes, she announced an opportunity for extra credit at the end of class. She apologized for the mess to the students and told them if they cleaned all the dirty test tubes plus their own usual cleanup, they would receive extra credit on their lab reports. (This was encouraged by the fact that the students had received not-so-hot grades from their previous lab.) The following week, Jackie informed the class of messy students that because they had left the lab in a mess, points were subtracted as a consequence.

### **Now I can understand you**

It was the last lab before Thanksgiving—Lewis Structures—a “dry lab”. All students need to do was fill in all the blanks in lab manual. There was no lab experiment. Gracie, the TA, noticed that Jim didn't show up for lab that day, but she saw his lab report at the end of the lab. So she asked Jim's partner, Mike, if he knew what happened to Jim. (Gracie had recognized the same handwriting in the second part of both lab reports.) Reluctantly, Mike confessed. Jim wanted to go home early for Thanksgiving, so he finished the lab except for two unknown structures that Mike completed for him.

Gracie was very angry about that because Jim could have been honest and told her that he planned leave earlier. Other students had done that. So she gave both Jim and Mike a zero grade for that lab.

The next day Gracie had an early morning class. When she got up, she felt sick and she didn't want to attend the class, but she was also worried about the effect of an unexcused absence on her grade. Gracie had a nice roommate who was in the same class. She asked her roommate to help her out signing her in. The professor in that course noticed both Gracie's absence and the presence of her signature. The professor sent an e-mail to Gracie to ask what had happened. After the explanation, professor forgave her, and gave her a warning.

At that moment, Gracie could understand both sides, teacher and student. And she wrote to Jim and Mike let them know not do that again and changed the scores.

### **Offensively Obnoxious Student**

After several weeks, the students have become comfortable with Morgan, the TA, and working with each other. They have also learned many of the basic techniques and laboratory skills; therefore the questions on such topics have decreased significantly. Morgan has noticed that the students have been working more independently. However, one student in the class, Joe, continues to ask a barrage of questions every class period. Joe also tends to use loud offensive language to gain her attention.

At first, Morgan directed Joe to the lab manual or to other students for help with the questions. In regard to the obnoxious behavior, she politely asked Joe to keep his comments to himself. After one class period of peace and quiet, the comments began to fill the air again. From across the room Joe shouted, “Why do these labs take so f\$#%^@ long? I’m missing \$1 drafts at Kate’s.” This time Morgan ignored Joe and his comments in an attempt to make him realize that this was not a good way to gain attention.

Sara, a student across the bench from Joe, became increasingly agitated by Joe’s rude comments. After Joe left lab for the evening, Sara came to Morgan. “How can you stand Joe’s comments? He is so obnoxious and rude. I don’t need to know how drunk is going to become every Thursday night. Can’t you make him stop?”

### **Oil and Water**

Sudhir, an International TA, was adjusting well to a new country and new people. He had no problems with spoken English, bonded well with his students, and performed the instructional duties well. His students, including some Asian International students along with a majority of American students, respected him. It bothered him that there was little or no interaction between the American students and the International students in the laboratory. As a result, certain groups of students were making similar mistakes time and again. He reasoned that it would help them to learn from each other, avoid mistakes, and develop a better understanding of the science along with life in general and the different people around, if he mix up the students and had them perform the Chemistry experiments with different lab partners each week. Before going ahead, he decided be a good topic to discuss with other TAs and the course instructor to see what they thought about “emulsification of oil and water”.

### **One Spill Too Many**

In a first semester organic chemistry laboratory, all twenty students work individually. During the first week in a three-hour lab, Sally spilled her sample. At that point she did not have enough time to repeat the experiment. Sally, a bit distraught, asked her teaching assistant, Mike, if her percent yield will hurt her grade. Mike responded, “It’s okay, according to the Dr. Kay you cannot lose points due to poor yield. Just explain what went wrong and how you can avoid a similar situation next time”. Consequently, Sally reported a 0% yield, cleaned up, and left the laboratory.

The next week Sally once again spilled her sample. Mike was suspicious, but did not say anything and gave her the benefit of the doubt thinking she was just clumsy. Mike

asked Sally to repeat the experiment, because she had enough time for one more try. Halfway through the experiment, Sally spilled her sample again prior to work up. At that point, Mike pulled Sally aside and asked her about the situation and why she keeps spilling her sample; only to find out Sally had a learning disability and the lab environment, with all the students, was extremely overwhelming to her.

### **Only Grades Count**

Becky handed back the graded laboratory reports from the previous week after making a few comments about how the class did. Shortly thereafter, Brian, a premed student, came to her to ask about his grade. “How could you grade this? You weren’t even here last week.” (Becky had a dentist’s appointment. It that was at the only time she could get, so she switched labs with Jennifer, another TA.) Becky replied, “It is true that I wasn’t here last week, but that doesn’t mean I am unable to grade your work.” Unconvinced, Brian continued, “But you have no idea what that other TA said. You have marked off for things she said.” The conversation continued without resolution.

Finally, Becky got a bit miffed, “Look, the things I marked wrong are wrong. It is your job to understand. I can’t give you credit for things you don’t understand. You would be a lot better off if you would worry more about understanding chemistry than about what grade you got. You say you need a good grade in chemistry to get into med school. I say that until you understand chemistry, you might as well forget about grades and med school. If you don’t like your grade, go see the professor”

Afterwards, Becky continued to fume to herself and the other TAs in the lounge. “All these students worry about is grades, grades, grades. Don’t they ever worry about understanding? It’s ridiculous.”

### **Only This Time**

There is a limit to everything. One day a student named James came into Stan’s lab section to make up the lab he missed in another section. Stan accepted him, but he found that James was even worse than his laziest students. James chose a diligent student as his partner and did little during the whole lab period. At the end of this lab, Stan found that James was copying the post lab part from his partner. Stan could not let this happen, so he told James quite frankly, “I plan to tell your TA about this and will recommend that you get zero for this lab.” But James pleaded, “Hey, please, only this time, I would never do it again.”

But Stan didn’t think so. He took this event seriously and reported it to James’ TA Sara. Much to Stan’s amazement, Sara said, “Cool it. That is just the way he is. He is responsible for his own study. I seldom care about his behavior.” Stan felt confused, should he be demanding on his students or just let things go as the students wish? Since the grades for all of the sections are averaged, was he hurting his students in comparison to Sara’s?

### Order in the Lab

Like any other TA, Tommy was expected to conduct the organic labs assigned to him for that semester in the order determined by the supervising faculty member. He also was expected to proctor and grade exams of students in that organic course. Early in the semester, the students were tested on stereochemistry and a surprisingly large number of good students did poorly on that part. Although the students were disappointed, they didn't complain much about it.

Half way through the semester, in one of the labs, the students were given a handout and models to practice stereochemistry. The students surely had a good time working with it and understood it much better. Becky, a student in Tommy's lab section, complained, "Why wasn't this lab conducted earlier? We should have had this lab before the first exam." Tommy didn't want to blame the instructor, but he did see that the student had a point. He was at a loss for words.

### Others Know More Than Me!!!!

Sudha has always tried her best to help out her students with their lab work, especially the parts involving cumbersome calculations or too much of brainstorming. She taught the CHEM 101 course which was dominated by mostly the fashion design, dietetics, and philosophy majors, i.e. the non-science majors. Half the time she would be pacing around the class from one raised hand to another answering questions to those who thought chemistry and mathematics were a punishment to them.

In one of her sections, she had a student called Kristin. Sudha noticed that Kristin never asked her questions while everyone else was participating and trying to finish off their work. Kristin always waited for the entire class to hand in their lab reports and then bombarded Sudha with all her questions. When everyone else was at the working on problems and asking questions, Kristin always sat idle!!!!

When Sudha confronted Kristin about this, she burst into tears saying, "I don't know anything about chemistry. I am afraid to ask questions in front of everybody because they will see how stupid and dumb I am." Sudha tried her best to reassure Kristin that she wasn't stupid or dumb and that most of the other students had questions just like hers. However, Sudha could see that such consolation had little effect. She needed medicine for Kristin's soul.

### Overruled

As a habitual organizer, Ella always placed her lab reports into alphabetical order before beginning the long process of grading. As she was chugging along through one of her sections, she noticed one of the results and discussion sounded eerily familiar. Knowing who John's lab partner was, she flipped back to the lab she *just* graded and compared the two. They were identical.

It was not clear who had copied from whom, but it was clear that the two students had not prepared their discussion separately. Ella immediately e-mailed her professor, asking what the proper protocol for this situation was. She had listened to many talks during her own orientation about the university's policies about academic dishonesty, and was sure that the students would at least receive no credit for the lab report.

When the professor responded, she was shocked at his response. “Since it is not clearly stated in the syllabus that working together in such situations is prohibited, we cannot report the students for academic dishonesty.” Instead, the course supervisor sent an e-mail to the class sternly saying that this behavior would no longer be tolerated in the course. Ella was very disappointed, and still felt action should be taken at least towards their grade.

### **Paid Tutoring**

Although this was the first time for Joyce to be a TA, she did very well. All her students liked her very much, and they thought Joyce explained things more clearly than the instructor did in the lecture.

It was an evening lab section and all of the students finished lab early. Joyce knew that her students were going to have a mid-term exam the next day. So she told everybody that she would stay in the lab to answer any chemistry questions till 10 pm. After answering many questions, it was near 10 pm.

One of her student, Aaron, came to Joyce: “Joyce, will you tutor me tonight, I would pay you 100 bucks?”

Joyce felt astonished but she replied: “I will stay till 11 if you really need me to help. You don't need to pay me.”

Aaron said: “I know nothing in chemistry, you know that. I don't want to take up much of your time without paying you.”

Joyce insisted that she could not take Aaron's money for tutoring. But she would like to tutor him in her office hours or any other time by appointment.

After Joyce went home, she told her roommate Lisa, a second year TA, about what happened in the lab. Lisa said: “Well, it is reasonable that if you work extra hours for the students, then they pay you. I got paid when I spent extra hours tutoring.”

### **Pair Repulsion**

At the beginning of the semester, Chari paired up the students in his lab and put Jamie and Jessica together. Early on, he assumed the pair was working well because their lab reports were good. However, as the semester progressed, Chari observed that Jamie always seemed prepared while Jessica didn't seem to have a clue about what was going on.

He first noticed the problem when they did calculations. It became evident that Jessica was not serious at all and wanted Jamie to dictate all the answers. As they continued working, Chari could see there was some friction. He assumed that they would workout the problems together. No so. Much to his surprise, one day when he asked Jamie to help Jessica, she refused. Eventually, he had to help out Jessica.

As she was leaving at the end of lab, Jamie came to the Chari and asked. “Can I work alone or with someone else next time? I attend lectures regularly and work hard. Jamie skips half the lectures. I don't want a lab partner who isn't interested in learning and always comes to lab unprepared.”

While there was some truth in what Jamie said, Chari was really perplexed because in his country good students are expected to help poorer students whatever the reason they did poorly.

### **Parasitic TA**

Tammy Sharp takes pride in keeping her schedule organized, balancing her own work with her TA duties, and ensuring that all assignments are turned in on time. Her TA partner, Jason Dolittle, tends to handle things a little differently. Initially, this did not bother Tammy because it didn't affect her duties. However, as the semester progressed and the pressures of being a grad student became a reality, Jason missed many of the TA meetings. Tammy found herself having to relay messages to Jason because the instructor could not reach him. This became a real problem when they had to make up quizzes for their class together. Jason not only forgot about this assignment but did not know details on how to complete it because he had missed that meeting as well. Tammy then became responsible for filling in all the blanks for Jason. The icing on the cake for Tammy came when Jason, who barely seemed to have time to complete his own work, found the time to interrupt her office hours with students. He would frequently interject from his nearby desk, without so much as an "excuse me", with his own explanations any time Tammy would conduct review sessions with students. This would often leave the students confused because Jason's explanations were often off target.

### **Passed Out**

It was a chilly winter morning and Matthew had to proctor an 8 AM examination. The instructor in the course was proctoring the same exam for the other half of the class in another building. It was the first time Matt had ever proctored an exam by himself and he was bit anxious. He gave the necessary instructions for the exam and kept an eye on the class, making sure that everything was ok.

At about 8:25, Leena raised her hand. Matt walked over asked, "Yes, what's your question? Leena's face was ashen and blank. She didn't answer. She looked weak. Recognizing Leena didn't have a question about the exam, he asked, "Are you all right? Again Leena didn't answer but rather gestured toward a medical alert bracelet on her wrist. After a short pause, she whispered, "I'm about to faint", and keeled over. Matt broke her fall, but she ended up passed out on the floor and the whole class of freshmen was watching.

### **Passing the Buck**

Justin worked as one of the TAs for Prof. McChesney. Unlike many general biology courses, the lab and lecture were coupled, so that material discussed in lecture would be reinforced the following week with an experiment in the lab. This was nice in theory, but Prof. McChesney loved to tell interesting stories that took time. As a consequence, he kept falling behind the schedule in the syllabus. Not infrequently, Justin and the other TA's would get an e-mail message from Prof. McChesney of the following sort.

Dear TAs,

Today in lecture I covered the material through Chapter 23.6 in the textbook and did not get to the remaining sections that the students will

need for this week's labs. I told the students to read the remaining sections. Please make sure that they understand that material. Thank you.

Prof. McC.

Justin felt this was unfair. After all, he wasn't being paid to lecture. Because he had lab sections early in the week, his students were even less prepared than the students in the other sections. Furthermore, the extra time he spent preparing the students took time away from the lab. The other TAs told him, "Just suck it up," which he did. Nevertheless, he dreamed of sending Prof. McChesney a message saying, "Sorry, I didn't have time to do the experiment this week, could you cover it in lecture?"

### **Passive Aggressive**

Being a biology TA suited Juan. He enjoyed his time with the students and teaching in general. Students in his labs submitted typed post-lab assignments at the start of each class. At the beginning, a few students forgot to print out their assignments. Though Juan preferred to have hard copies, he told the students that, if they emailed him their post-lab report before class officially started, he wouldn't deduct any points.

Amos seemingly had a problem with this post-lab concept from the beginning. For the first assignment, Amos handed in a poorly done handwritten report with the explanation, "I don't have Word." Perplexed Juan thought, "How could a college student not have a word processor on his computer?" Juan suggested that Amos download OpenOffice for his school work. However, even with this new tool at hand, Amos continually came to class and ask if he could email him the assignment instead of printing it out like everyone else in class. This annoyed Juan, but the lab syllabus didn't stipulate that a hard copy had to be submitted, only that it be typed. To complicate matters, Juan suspected that Amos knew that this bothered him, yet kept doing it anyway. Once, Amos didn't even bother to use OpenOffice and just typed his post-lab directly in an email. Juan couldn't understand the problem. As an undergraduate, he didn't have a printer either, but he always managed to print his assignments when required. Juan found himself growing to dislike Amos over something Juan felt was actually kind of trivial.

### **Physical Chemistry?**

Dan is a TA for CHEM 103H night labs, and it is his first year teaching. Everything in the lab seemed to be running smoothly for the first half of the semester. After a couple months Dan could relax more in the lab and become comfortable with instructing the students. While walking around the lab one night for a titration experiment Dan asked Jim, "Hey, what kind of numbers are you getting for your titrations." Jim seemed flustered and initially asked what numbers Dan was talking about to which Dan said, "How much base did you need before the color change?" Jim replied, "Oh, I can't find where I wrote them. Darn!" Dan suspected that Jim was lying, but still played the game and walked around the lab.

A few minutes later when Dan was at the other side of the lab, Jim walked over and asked another student what numbers he obtained for his titrations. Seeing this, Dan decided that he would just reject Jim's lab when it was handed in. Next week the rejected

lab was returned to Jim with, “Not your work, F,” written across the top. Jim was not doing well in class and needed a decent grade to help his lecture grade.

Jim said, “What makes you think this was not my work?” Dan responded, “I saw what went on. You got the grade you deserved.” Jim did not accept answer and his temper rose. Dan tried to calm him down. Jim denied copying values for the titration and demanded the grade to be changed. With the whole class hearing this, Dan wanted to get the situation out of the lab and into the hallway, but before he got to the door, Jim shoved him .....

### **Please Attend Office Hours**

During his office hours on Tuesday, a few of Mike’s students come to ask questions regarding the labs in the week. Mike gladly helps them prepare for their next lab. These students are motivated and they are rewarded because they get their questions answered and understand better. However, they represent a small proportion of the students.

When Mike is teaching and grading pre-lab reports, he finds that a number of students in his sections do poorly, notably those who never show up for office hours. As a consequence, they encounter more problems with the lab work, can’t finish in time, make simple mistakes in their lab reports, and sometimes just leave questions blank. Mike is frustrated because he has to spend extra time explaining more than just the pre-labs.

He asked some students, “Why didn’t you finish the pre-lab before coming to the lab?” One of the students, Selina, answered, “In a 200 point lab, the pre-lab report only counts for 20 points, and some pre-lab questions are too hard to answer.” It seems to Mike that students from other lab sections come to his office hours quite often while those from his sections rarely appear. Mike would like his students to take advantage of office hours and do well, but he has a hard time motivating them to do so.

### **Plug and Chug**

Serial dilution seemed like a simple concept to Frank. It was perfectly clear that if you doubled the volume of a solution, the concentration would be halved. It wasn’t rocket science. It didn’t matter whether it was DNA, phosphate buffer, or bacteria. All were the same. You could figure things out in your head. But the students in his introductory biology lab were not getting it. They felt it was magic the way Frank could come up with the right numbers without a calculator.

“What formula do you use?, one student asked. “Well, if you want to make it easy, you can use the equation,  $C_1 \times V_1 = C_2 \times V_2$ ”, which he wrote on the board. Another confused student questioned, “Wait a minute. Is that a formula or an equation? I thought equations had to have a ‘x’ or a ‘y’ in them and that doesn’t have either.” Suddenly, Frank felt he was in way over his head. “Look. Don’t spend your time memorizing formulas and equations you’ll forget. Think about what you are doing. Try to understand. Imagine what is going on when you dilute something.” Everything he said fell on deaf ears.

### Poison Candy

Andrew's labs were cancelled the previous week to allow students time to study for their midterm exam. Being thrown off his schedule, Andrew spent hours grading the exams, and completely forgot his Tuesday lab the next week. The students, bewildered and furious for wasting their time waiting for Andrew to show up, complained to Prof. Ishida. She called Andrew in and issued a warning for his careless mistake. The following week, in an attempt to make up for his blunder, Andrew brought a box of snack bars to lab for the students and apologized for his absence. However, Shawna, a student who always seemed unfriendly towards him, called this blatant bribery and admonished him for bringing food into the lab. She threatened to report him to Professor Ishida and the office of student conduct. He wasn't sure she was serious or just trying to make him uneasy.

### Poisoning the Well

The day of the laboratory final examination in Introductory Biology, Brittany showed up 20 minutes early to set up the practical parts of the exam. Everything went smoothly. Five minutes before the exam was supposed to start, she opened the door to let her students come in. She was excited that this was the last lab and started out by wishing everyone good luck and explaining the practical parts of the exam because most of the students had never before taken a practical exam. The exam started without a hitch. Brittany was pleased and a little surprised as students moved smoothly from one station to the next. As she looked over the room to do a mental check of what she needed to watch, she paused on the first student at the spectrophotometer performing his dilution. He correctly blanked the instrument and then measured his diluted sample. Then, much to her dismay, he poured his dilution back into the stock solution!

### Pop Quiz

Prof. Barton wanted to give his Biology TAs some autonomy, so he expected them to make up and give at least three unannounced quizzes in their labs. He said it was up to them to decide what they wanted to test and when they wanted to give the quiz.

Andy decided this was the week he would give a pop quiz. He announced the quiz shortly after the students arrived. "Please put everything away and take out a piece of paper. We are going to have a short quiz on things you should have learned in preparation for today's lab." The students groaned and protested. Because this was the first time Andy had given a quiz, he wasn't fully prepared and after five minutes he suddenly became aware that the whole class was using their notes! Figuring it was too late to change things, he allowed them to finish the quiz with open notes.

Later in the week in Andy's second section, he gave another quiz, but it was hardly a surprise to the students who had friends in the earlier section. This time Andy was sure to have the students put *everything* away, including their notes. Judy complained, "Why do we have to put our notes away? That's not fair. You let the students in your other lab use their notes."

### Pop Quiz Distress

Jules has known “almost since conception” that she was going to become a doctor. Both of her parents were MDs, however, she was barely passing her General Chemistry exams and so she desperately needed to do well on the laboratory component of the course. She had told that many times to Keisha, her TA. For the second time in the semester, Keisha decided to give a pop lab quiz at the beginning of a lab session.

Jules became distraught because she believed that Keisha was picking on her in particular. After the quiz was handed in, Jules protested in front of the other students, “You should have informed everybody ahead of time that there would be a quiz today. Furthermore, the questions you asked were unfair. For example, the lab manual says nothing about using gloves when handling hydrochloric acid, but you said the answer for that question was that we did need to wear gloves when using HCl. Since the lab manual didn’t say that we needed gloves, I should get credit for that question.”

Keisha thought her quiz had mainly common sense questions that were quite straight forward and things the students needed to know coming into lab, so Jules’ attack caught her somewhat off guard. After reflecting a few seconds on the situation and knowing Jules a bit, she responded,...

### Positive Feedback

Mort wasn’t particularly fond of his 8 am TA training class every Monday. It was hard to roll out of bed that early after a tough weekend and besides most everything discussed seemed like common sense. Apparently Prof. Tall wasn’t too happy with the way the course was going either that morning about mid-semester when he asked whether the class should be graded rather than pass-fail.

Mort volunteered the first response. “I don’t think this course should be graded. After all we are here to do research, not to become teachers.”

Prof. Tall: “What do other people think?”

Penny: “I agree. This course shouldn’t be graded, but for a different reason. At this stage grades aren’t important. It is what you learn that counts.”

Porter: “That is all well and good but when you think about where you put your time, you put it where it counts. If this course was graded, I bet most people here would give it more time.”

Prof. Tall seemed a bit frustrated and uncharacteristically answered a question he asked, “Why do you have to take this course in the first place if it doesn’t relate to your ultimate goals?... It has nothing to do with whether you might be a teacher in the future. It is because you are a teacher **now!** The salary you get is called a *teaching assistantship*. The University is paying you to be a teacher, not a researcher, and they want you to be a good teacher. If this course is not helping you be a better teacher, there is a real problem. Grades shouldn’t be your motivator. Rather than grades, should we pay you in relation to how well your students do on the final exam?”

### **Post-Office Hours?**

Butch held office hours on campus for his freshmen chemistry students every Monday at 6:30pm. Normally, a few students would show up each week with questions and stay for most of the allotted hour. One week, two students came to office hours, but left by around 7pm when their questions were answered. Around 7:20, Butch was getting ready to pack up when a woman from his class showed up with only a few minutes remaining. After he asked if she had any questions, she hesitated, looking toward the ceiling in search of a question that had not yet been formulated. It seemed peculiar that this student showed up so late to office hours, in no apparent need of help. At 7:30 as Butch picked up his things to leave, the student asked, “Hey, I was going to go out for dinner at this restaurant; do you want to come?”....

### **Power Failure**

Lucy wasn't fond of night laboratories, but in the summer it was still twilight at 9:00 pm when her lab was over. It was raining lightly one evening when her lab started at 6:00 and there was thunder and lightning to the west. Things were going fine with the column chromatography experiment. The students were collecting fractions and analyzing them in a spectrophotometer. Suddenly around 8:00 there was a loud clap of thunder. The lights flickered and then went out.

### **Preempted Prelab**

Vicky, a first-year international graduate student, teaches three lab sections of Introductory Chemistry. Being nervous, because she does not pronounce words perfectly, she compensates by making slides for her students so that they can see what she wants to say and can understand better.

Before a particularly long and complicated lab, Vicky told her students to listen carefully. However, when she started to give the introduction, some students were ignoring her and talking. She asked the students to keep quiet because the introduction was important. However, a few students kept on talking. Annoyed, Vicky stopped talking and asked if they still wanted to listen to her. No one answered. She asked again and got no answer. Finally, one student said that they wanted to start the experiment right now. That made her angry and depressed because she had spent a lot of time and tried her best to make slides that would help her students. She was sure that these students did not know how to do this experiment due to their very low pre-lab quiz scores. Although she asked them to read the lab manual before the lab, they always got 2 or 3 for pre-lab quiz.

Rather than being her usual nice self, Vicky decided to be a strict teacher. She turned off the projector and told her students that she would not answer any question about the experiment except for those not shown in slides, and they had to hand in their reports on time. For that experiment only a few students finished their experiment on time and she made those later reports lose 5 points.

### **Prelabs: To Be or Not to Be**

Chester TA'd for Chem 103, the general chemistry course for students who are majoring in the sciences, but are not chemistry or chemical engineering majors. As part of his duties as a TA for the course he was required to supervise the students while they performed prelabs. These prelabs consisted of a short experiment, which was to be done before the actual experiment. The purpose of these prelabs is to introduce the students to the experimental material and allow them to perform a small scale version of the experiment to work out any kinks before the actual experiment is performed.

Chester didn't mind having to do these prelabs, but on some occasions he thought they were redundant and felt that the students would get much more out of a comprehensive prelab lecture. He didn't think that there was any problem with skipping the prelabs on certain occasions because the students were mostly being graded on completion and it could only help to streamline the labs. He was also told that he had a modicum of control over the labs he was teaching and this only served to reinforce his feeling toward certain prelabs. The supervising instructor discovered that Chester had skipped a couple of prelabs and blew up. "If you can't follow directions, you're fired!"

### **Problem with a Solution**

Sandra TAed the quantitative chemistry lab late Wednesday afternoons. On Monday, Paul, the solution stockroom manager, had provided NaOH and iron solutions for the week's experiment that analyzed aspirin with ultraviolet-visible spectroscopy. But after labs (which had been working fine) on Tuesday, Paul had to make up a new batch of solutions for the rest of the week. When the students mixed the solutions with their samples, little orange precipitants formed in solution. Sandra had her students continue working with the samples and told them to remake solutions if the precipitants started settling out. She called one of her fellow TA, Henry, to come help her figure out the issue. Together they determined the solutions were far too concentrated resulting in turbidity that caused scattering which resulted in meaningless numbers. Because Paul had left and removed all of the solid compounds, they could not make new, solutions for the students in Sandra's section or Henry's night section.

Sandra had her students continue with the experiment, remaking many of their solutions in attempts to get good results. Several of her students complained that it was not fair. Their grades were based on how they compared to everyone in all ten lab sections and now would suffer for someone else's mistake. This frustration was further influenced by a previous solution mistake by Paul a few weeks earlier that had affected Sandra's section.

### **Problems Compounded**

Gretchen felt she was doing a good job managing her time in her first semester as a TA—that is up until she got sick, missed a few classes, and got behind in several courses. She had a fever and couldn't get out of bed one day and happened to miss an important TA meeting. The procedure in the lab manual for lab the following week had mistakes. Students needed to be informed of these mistakes and to use a different procedure for part of the lab.

Unaware of these problems and still weak from her cold, Gretchen started the pre-lab exercises according to the original instructions. Soon students had a myriad of questions due to the erroneous lab procedure. Gretchen worked frantically to spot the errors and correct the procedures as best she could. Then, due to the errors in the manual, the students used up all of a critical reagent needed for the experiment.

With all the problems they were having, the students became more and more frustrated as the time left in the lab period was getting shorter. Reluctantly, Gretchen realized that most of the students could not finish the lab by the end of class. She wanted the students to get credit for the lab and gain some understanding about that lab's subject matter, but she didn't want to punish the students by forcing them to hand in incomplete labs, especially when the failure of the lab was due, in part, to her inadequate preparation.

### **Professor MIA**

The TA's were having their penultimate TA meeting of the semester. As had become usual, the professor was running late again. Everyone waited on him to arrive, first for five minutes, then ten, fifteen, and eventually twenty minutes. Still the professor had not shown up, and the meeting had not started. Frustrated because so much valuable time had passed and, knowing that he along with the other TAs all had a lot of work to do, Pat, asked the head TA to begin the meeting by going over the prelab power point. The meeting proceeded as normal without the missing professor. At the end Antonio and Cynthia raised questions about the distribution of grading assignments for the exam the prior week, since some students had only 1 page of multiple choice questions, while one student was stuck with 4 pages.

After the meeting, when the students had returned to their office, they received an email from the absentee professor. The email informed them that he has been distributing grading assignments this way for 15 years without complaint, and that if you feel it is taking you too long to grade, then you should look at his grading guides, because you must not be doing it efficiently. Additionally he lectured the TAs on the importance of the TA meetings and how their attendance was mandated by their TA contracts. After the email the professor came by the TA office asking to have a meeting the next day with Antonio, Cynthia, and Pat. Pat asked the professor what the meeting was about, but the professor merely said he would find out at the meeting and left.

### **Professorial Confusion**

The university had cancelled classes for a couple of days due to a severe storm. As a consequence, some lab classes needed to be dropped and others made up to get things back on schedule. Because there were many changes, Prof. Kriss e-mailed the entire class including Ben, a TA for several lab sections, informing them that the lab cycle was now going to change on Wednesday of that week. The students in Ben's Monday night lab were confused about the wording of Prof. Kriss's e-mail and they asked him both via e-mail and in person if they had lab that week on Monday. Prof. Kriss confidently told Ben's students that they did not have lab, which actually was not part of the plan.

That night Ben only had three students show up. They were students who felt it was perfectly clear they had a Monday night lab to attend. Ben approached Dr. Kriss the next day: "Most of my students were told by you specifically that they did not have lab last night." To which Professor Kriss responded, "Yeah, I dropped the ball on that one. I got confused what week it was." "So what should I do?" asked Ben. "I don't think the students can finish all of the labs in the remaining lab periods." Prof. Kriss unsympathetic response was, "They will just have to work hard to get them all done. Just don't let them fall behind."

Ben was very put-off by this conversation and felt that Prof. Kriss didn't want to deal with the problem. At least he could have offered an apology. Ben also thought it unfair that Prof. Kriss make him essentially punish his students in lab to get caught up because of Prof. Kriss's mistake.

### **Quantitative Illiteracy**

Amy's undergraduate career involved several math courses and she felt comfortable with calculus and differential equations. Thus it was a surprise to her that there were students in college who couldn't even solve a simple algebraic equation. She began to wonder if they knew multiplication and division without a calculator. The chem lab Amy TAed was for non-majors. They seemed to be able follow explicit directions in gathering data, but they had no idea why they were collecting those data or what to do with the numbers they got.

One day the lab was a bit more difficult than usual and what students needed to calculate was a little complicated for them. Ellen, a student, handed in her lab report, leaving the whole calculation part blank. She said it was too difficult and she didn't know how to do it. Amy told Ellen to discuss it with other students and try again. She also asked a student who was doing well in the course to. Ellen agreed, but about half an hour later, Amy discovered that Ellen turned in the lab report and left when she (Amy) was working with other students. The calculation part was still blank.

### **Questions, Questions, Questions**

Alfred usually does not get tired of answering questions and is very attentive to the students in his lab section. He answers any kind of question and does not forget to encourage students. When students ask questions on results, conclusion, and post lab, Alfred helps them figure out by fostering critical thinking even when that means he has to spend at least 10-15 minutes with each student. But then, as the semester passes, students begin to ask him even trivial things including the procedural matters that are already stated in the manual. Alfred finds himself repeating the same answers over and over. Some students do not even try to figure out by themselves. They just wait for Alfred to come to explain everything.

### **Rainy Day**

Robert works his experiments carefully and always gets good results. As best his TA June could remember, Robert never forgot to bring his goggles to lab and always dressed properly. One day, it was pouring down rain outside when the 3:30 pm lab was about to begin. As a result, many students, including Robert, were a few minutes late. Nevertheless, June began the experiment on time. When Robert came in he was soaked from head to toe with raindrops dripping from his hair. "I'm sorry, I'm late. I was hoping the rain would let up," he said. "I forgot to bring my goggles because I couldn't go back to my dorm. Can I still do the experiment?" June said firmly, but sympathetically, "No, you have to have your goggles or you cannot do the experiment." "Ok." He said and ran back to his room. A breathless Robert returned 20 minutes later and displayed his goggles happily to June. But, when he came in the lab, June noticed he was wearing sandals! "Oh, no open shoes! You have to change them!" She said. "Oh, my god, I forgot to change my shoes!" Robert almost cried out...

### **Read the Book**

In sophomore organic laboratory for chemistry and biochemistry majors, students need to learn how to present experimental information. So on the first day of the lab, Charlie described in detail the notebook format and his expectations for the lab write-ups. He waited for a couple of weeks to see if the students were following his instructions. A few of them did. For those who didn't, he handed out a sample lab report. Until then, he hadn't taken any points off the students' lab reports, but afterwards, he started taking off some points for not following the notebook format. Despite his explicit instructions, some students continued asking Charlie what they needed to do.

Charlie took care not to display his frustration to the students, but such restraints did not apply in the TA lounge. "These students don't read the instructions before they come to lab. I want to scream sometimes. They keep asking questions that they could answer themselves if they would only look beyond the end of their nose. I refuse to answer those questions and suggest they *reread*, Ha!, their lab manual carefully. It's all there in the book. Can these students read?"

### **Redox Problems**

Because the final grades in Intro Chemistry take into account the scores on every exam during the semester, the students take every test seriously and work hard to do well. Normally, the laboratory exercises amplify and support the lecture material such that students appreciate the concepts that they learn in the lectures much better once they finish the corresponding lab session.

The second test included, among other concepts, oxidation states and balancing of redox equations. Prof. Jones had covered these concepts pretty well in lecture. However, the continuing education students in Jim's Saturday lab had to take the test Thursday before they did the corresponding redox laboratory. Upon grading the tests, Jim found that most of those students performed poorly. Their average score was 45 when the class average was 61.

In the next lab, Jim asked the students what happened. George, an auto mechanic, said, "I studied the whole week. I read the whole chapter from the textbook. But in the end, I failed the exam." Another older student added, "We studied everything, but we did not know redox questions would be on the test. We were completely unaware of the type of questions asked." Finally, a student summed it up "We did not have any practice of these concepts. These things were explained in the lecture, but we never went through a 'guided' practice session in solving these problems. If we had finished this lab before the test, we would have all passed the test."

Jim met Prof. Jones and told him about the students' concerns. He said, "I wanted the redox lab to be finished before the test, but the labs are planned for the 700+ regular students. Unfortunately, continuing education students are just one section of about 15 that has different scheduling."

After the test, Jim explained the redox concepts during the lab session and worked along with the students on the board they felt comfortable. They understand the concepts well now and can solve these kinds of problems easily. They can do well in their final exam. But, the damage is already done. Their final grades are going to be drastically affected by their scores in the second test. The students are very much worried about this, and talk to Jim hoping he can do something.

### **Relaxed or Not?**

Barb and Jon discussed the photosynthesis lab they were TAing for the week. "The students don't need to do anything but let the computer do everything. We can sit down through the lab and take a rest." But to their dismay, nearly half the computer programs or associated instruments broke down during lab that week. They didn't know how to fix the problems and were running around desperately to find someone who could. Some were minor problems. For instance, one group of students saw a totally flat curve on screen which meant no CO<sub>2</sub> was being consumed. They checked every part of the instrument and couldn't find any problem. About 20 minutes before the end of the lab, a student found that the leaf in the chamber was detached from the stem and that explained the curve perfectly.

Neither Barb nor Jon knew much about computers, so they were frustrated when students wanted help. Several groups had no data at all, but they seemed to enjoy the situation because it was easier for them to say the computer broke down than to analyze the data. Jon asked them whether they could redo the experiment later in the week when the bugs were worked out. They replied they had no time this week and they wanted to leave the lab early.

In fact, such things happened again the next week. The next lab was to compare the rate of CO<sub>2</sub> fixation between C<sub>3</sub> and C<sub>4</sub> plants. Dr. Bush, who had designed these investigative labs, was furious. "These experiments have been done every year for five years without a hitch. If the TAs would get off their butts and use their heads, this wouldn't have happened."

### **Remember Your Units**

Chan graded lab reports conscientiously. They were graded on time and always returned the next week. He soon recognized that the students were careless and made simple mistakes. He remembered one of his teachers who gave no partial credit. Every answer needed to be letter perfect. He also remembered that as a result he paid attention to details that often turned out to be more important than he originally thought. So when a student neglected to include numbers on weights, concentrations, slopes, and so forth, he would take a point off and underline every mistake in red. Some papers with correct numbers, but few units, looked like they had bled to death.

When students complained, he responded. “Units are important because they give specific meaning to a number. If I ask your weight and you say 50. Is that pounds, kilograms, or something else? Pay attention to the details and you will thank me someday.”

### **Repeat Performance**

The faculty knew about Harry—the student on the seven-year plan trying to finally graduate. His GPA hovered around 2.0 and he needed to retake a four-credit virology course with a lab that he had actually failed twice before. He had a full-time job and his employer allowed him to adjust his schedule to take this one last course. Because he had taken the lab before, Harry sometimes didn’t show up but would reuse lab reports graded the first time he had taken the course. Other times he wouldn’t come and wouldn’t turn in a report. He reassured Beverly, his TA that he had done the lab before and really didn’t need to repeat it. “Besides”, he said, “I failed the course before because of the lecture, not the lab.”

Beverly didn’t quite know how to deal with this because she thought the course was a lecture-lab package and that Harry’s chances of passing would be improved if he would take lab seriously and do well, having done it before. Furthermore, Harry’s behavior made it hard for his assigned lab partner. About halfway through the semester, when Beverly finally found time to discuss the problem with the course instructor, she discovered that several of the labs Harry had missed were new labs not done the previous times he had taken the course. She asked the professor, “If Harry passed the lab part of the course the first time, is it really necessary for him to retake the lab now?”

### **Responsible Student**

Jackie was an excellent student. She was very attentive and very engaging during biology lab. She always used to come to lab on time and submit post labs on time. However, during the middle of the semester Jackie missed a lab and also did not submit post labs for them. TA Jason graded and posted the grade for the post lab. After receiving a zero grade in post lab for no submission, TA Jason got an email from Jackie where she explained that, due to her personal problems, she was not able to submit the post lab. Rather than make an excuse to resubmit it, she explained that a close friend had passed away a couple of weeks ago and she was having a hard time coping up with her loss.

### **Right Answer, Wrong Reason**

Nicholas and other TA's gathered for a late night session grading the chemistry midterm exam. For consistency, each TA got a different problem to grade. The problem Nicholas got required multi-step derivation calculation to obtain the correct answer. Some students' were exactly right and some others screwed up. Then there were still others who somehow got the correct answer by a method that made no sense. Was there another way to do the problem? How should the problem be graded? Obviously, their answers were correct, but, without understanding, the answer was meaningless. Should he give them most of the points or the opposite? Finally, Nicholas decided to separate the answer half and half. Students got half credit for the right answer but lost half the points for illogical procedure. To be consistent, Nicholas strictly obeyed this rubric. In the wee hours of the morning, near the end of the grading session when the TAs took a pizza break and talked a bit. One of the other TAs didn't agree with Nicholas' rubric and thought he should go back and regrade every exam.

### **Roommate Dilemma**

Ben and John are both from China. They knew each other online, came to America together, and found an apartment they could share. Ben is a first year graduate student while John is an undergraduate. Nevertheless, Ben was a bit surprised when he found John's name on the roster for a lab section he would be TAing. He was about to report the problem and switch sections with another TA when John said, "Why bother?" They did not have to let others know they were roommates. He promised that he would never ask for any 'extra' help and total fairness was all he wanted. So Ben did not report this and John became his student.

Everything went on well in the first few weeks, and then, while Ben was grading John's homework, he realized the answers were the same as on key the teacher gave Ben. Thinking back, he remembered that he was so tired when he came back home one night that he just left everything on the kitchen table after he had a snack. He figured John must have looked at the answer keys in the pile. When he asked John about it, John denied everything. Ben could not tell whether he was lying.

### **Rules to be Broken?**

Sam wanted to make sure that there was no communication gap between him, the course professor (Dr. Davis), and the students. So early in the semester he made a PowerPoint presentation listing course rules and regulations. To keep Dr. Davis on the same page, he asked him for inputs on the presentation. Dr. Davis made slight changes and forwarded it to all of his TAs for a course, as a useful resource. Sam presented this PowerPoint on the first day of the lab and posted it on Sakai. One of the rules was "Grades will not be changed after a week of being posted."

For one lab report, Sam had taken points off from a student's report by mistake. The student came back to him 9 days later to recover the points. Sam acknowledged that it was his mistake, but because the student was late in reporting this, he could not change the grade. The student protested and talked to Dr. Davis at the lecture. Dr. Davis met Sam

the next day, “I understand you had a rule, but the student deserves the points. Mistakes like these happen and from my end too, it is not a big deal. You have to be flexible.”

### **Running Late**

The first experiment in the course involved determining the limit of detection of a UV-Visible spectrophotometer. The professor in charge, Dr. Gordon, gave some general instructions to the students. Because there were more students than equipment, the students were divided into groups such that each successive group would start the experiment after the earlier one had finished. The first group started late, so the last group of students, Betsy, Chris and Daniel could not complete the experiment by the end of the lab. They left their solutions on the workbench expecting to come back later to complete the experiment.

The next day Lauren, the lab coordinator, was setting up the lab for the next section and saw the mess. She did not realize that the students had not taken the readings yet and discarded the solutions because she needed the glassware for the next section.

Betsy, Chris, and Daniel returned to take readings, and were shocked when they found out that Lauren had discarded their solutions. Betsy said, “We spent one whole hour preparing those solutions. We only needed to take the readings.” Daniel added, “What do we do now, none of us is free to repeat the whole preparation again?” In her defense, Lauren said, “I’m sorry, but you guys didn’t leave a note or message.”

### **Secret in the Drawer**

Based on his lab reports, Brenda began to think Alex was the best student in the lab she TAed. In each lab, Alex was always the first person done, got perfect results, and even right answers for pre-lab and post-lab worksheets. However, he never asked questions and seemed reluctant to talk when spoken to.

Near midterm, the procedures for one experiment were changed slightly from the previous year because an order for certain chemicals had not come in on time. Alex did not do very well. In fact, Brenda was a bit surprised because some statements didn’t make sense. They referred to reagents used the previous year.

In lab the following week, Brenda kept an eye on Alex from across the room. She noticed that Alex kept looking at some paper during the experiment. When Brenda walked in his direction, he quickly put the paper in his lab drawer. Later in the period when Alex was at the balance weighing things at the other end of the lab, Brenda took a peek in the drawer. There was the graded lab report of student from last year’s class.

### **Seeing Double**

On a windy fall evening, while grading the intro chem lab reports, a tired TA Clarisse began to think she was losing her mind. Had she not already graded this person’s lab? She stared at the page and remembered noting that method of solving the question being different from all the others she had seen (and even more damning, it was

WRONG). Furthermore, the work was physically formatted identically on the page! Clarisse quickly flipped through the stack of graded reports, desperate to confirm her sanity. “AHAH!” She found it. Clearly, it was a case of blatant copying. Energized and angered by the discovery Clarisse emailed the two students separately:

Dear Becky,

I graded the lab reports from this past week and found something curious regarding yours. Please come by my office this week to talk.

Best,  
Clarisse

The next day Clarisse documented the case with her supervising professor told her to give both students a stern warning and a zero for the lab. Upon meeting with the two students, they claimed that they had not worked together on the question. They both said that their PLTL workshop leader gave their section that answer at their session last week

### **Seeing Red**

Ed was the TA for a Tuesday morning Gen Chem lab. So far, Ed’s labs had gone mostly without incidents, even minor ones. He had just finished giving a quiz and was about to get his students started with the experiment when Doug, came up and said, “I forgot my goggles. You’ll still let me do the lab, right?” Ed knew how to deal with this. “You know you can’t do the lab without goggles. Sorry, but you’ll have to leave and make up the lab in another section.” Doug protested. “Aw, come on, Ed! You mean I got up early this morning for nothing?” Ed was about to reply when another student, Tyler, said, “Hey, Ed, I forgot my goggles too. I think I lost them. I don’t have to leave, do I?” It annoyed Ed that two of his students had forgotten their goggles. “Sorry guys, but you’ll both have to leave and find another lab section later.”

Tyler and Doug both continued to complain. A few other students chimed in, saying that Ed should just let Doug and Tyler stay since this was taking time away from the experiment, and the last thing the students wanted was to stay in lab longer than necessary. Just then, Chad, who recognized the tension and knew how to needle Ed, spoke up. “Hey Ed, I lost my goggles, but I borrowed my roommate’s. Look!” All eyes were now on Chad, who had on a pair of goggles with the front covered with masking tape. A pair of bloodshot eyes had been drawn in red magic marker over the tape. Almost the entire class was now laughing, while the few students trying to work were being distracted. Doug and Tyler continued to argue with Ed. The situation was getting out of control, and Ed knew he had to do something.

### ***Semper fidelis***

Derek had grown up on a farm and had joined the Marines when he graduated from high school. After the Marines, he went to college, became interested in chemistry, and was now in his first semester of graduate school serving as a TA in General Chemistry. He was used to hard work, discomfort, and persistence. He didn’t have much

sympathy for students who overslept, forgot their goggles, or partied instead of studying. Rules were rules and they needed to be followed.

His labs were not exactly boot camp, but Derek didn't give much slack. However, he was always fair and students respected him for that. Furthermore, he was actually a good teacher and was more than willing to go the extra mile to help students who put in the effort. In some sense, his students were his squad. His success was determined by their success, and success he achieved. The average scores of students in every one of his three sections were higher than in sections taught by other TAs.

James was one of the students whose performance prevented the section average from being even higher. James had been more than 10 minutes late for two labs and Derek had reprimanded him. One day after 15 minutes, James was the only student not present. Derek locked the doors and would not let James in when he finally showed up 25 minutes late. James knocked several times and then banged on the door. Derek ignored him and told the other students not to open the door.

James went to the head of the department and complained that Derek had singled him out, wouldn't even listen to his reason for being late, and was preventing him from passing the course. Furthermore, none of the other TAs was so strict.

### **Sending a Message**

Jake has missed every organic lab for six weeks. His TA, Arnold, assumed Jake had dropped the course because every missed lab is a zero and labs missing labs can only be made up the week of the lab, with instructor's permission. Even if his lowest score were dropped, Jake was failing lab. Attempts to contact Jake via email or phone failed. Jake had gone beyond the point where he could do anything to pass the course.

Unexpectedly, Jake showed up for a lab involving a database search assignment. Arnold thought, "This guy has to be really dense if he thinks he can pull out his grade at this late date. I'll send him a message that he should drop the course." In the database assignment, students use structure searches to learn about pharmaceuticals and name reactions. The TA assigns each student a different pharmaceutical compound to search. Arnold noted that one such compound not on the list due to its size and complexity was amphotericin B, a large molecule so biologically deadly that it's only used in cases of life-threatening bacterial infections. Assuming that an average student would take about an hour getting the hang of the user interfaces for the database search and drawing of simpler molecules, Arnold figured amphotericin B would take Jake at least 3 hours to do.

### **Share and Share Alike**

Kerry comes prepared for each lab she teaches. That includes working out all of the pre-lab problems in her TA lab manual ahead of time. She doesn't want any surprises and she wants to be able to help students who have difficulties. She arrived for her Tuesday lab and went about setting up equipment and making sure all of the reagents were ready to go.

At the beginning of lab, Bart came up to Kerry a bit distressed because he had thought he had put his lab manual in his backpack, but must have left it in his dorm room.

Kerry said, “No problem”, and let him borrow her TA lab manual for the period. It contained the same instructions as the student lab manual.

The next week all of the students did their lab and handed in their pre-lab assignment. While Kerry graded the papers, she noticed that many of the students had the same really odd numbers for answers that were not close to the right answers and were somewhat mixed up. When she opened her TA lab manual to check the questions, she laughed to herself. All of the answers the students had were the same as those she had written at the bottom of the pages in her book. But the answers were all wrong because they were notes Kerry had written while she was working out the answers. They were scattered on the page, not with the questions they related to.

### **Sharing the Responsibility**

“I can’t see anything with these dumb goggles on. Why do we have to wear them any way? Besides, there is nothing dangerous going on now.” Every lab period, Jerry would complain about wearing goggles. He didn’t like lab and took it out on Meijou, his TA. He seemed to enjoy annoying her. When she wasn’t looking he would take off his goggles and leave them off until she told him to put them back on.

After a couple weeks of this behavior, Meijou tried a different strategy. She made an announcement to the whole class that if anybody was caught without their goggles on, everyone in the class would have a point docked from their grade. Jerry liked to play games and figured that this was a bluff. It wasn’t. Immediately on discovering Jerry’s goggles on the lab bench, Meijou told the class she was sorry, but because Jerry took off his goggles, everyone was docked a point. She said it was everyone’s responsibility from now on.

### **Sick Student**

Siddhartha could hardly believe he had been in this country for three months already and so much had happened. He felt a bit overwhelmed at times as a new graduate student, but coped with the demands and still felt excited about his situation. He really liked being a TA in charge of several laboratory sections. However, with the responsibility came a number of challenges. Originally he had worried unnecessarily whether he understood physics well enough not to be embarrassed by the students in his labs. The real challenges turned out to be elsewhere and related mostly to non science issues like poor study habits and behavioral issues.

Perhaps Siddhartha’s most difficult situation involved Grady, a very bright freshman who missed lab in the third week. He e-mailed Siddhartha, “Sorry, I missed lab this week. Something personal came up at the last moment. I’ll be happy to do a make-up lab.” Siddhartha wrote back, “When can we get together for a makeup?, but didn’t get a reply for another week, by which time, Grady had missed another lab. Every time Siddhartha tried to contact Grady to arrange make up labs or quizzes, the responses were delayed. After missing five labs, Grady finally showed up. He was not well. It turned out that he had been in and out of the hospital being treated for a rare type of leukemia. He was determined not to drop his courses and wanted to complete the labs he had missed. Siddhartha really did not want to push him too hard, yet couldn’t see how to give him credit for this class.

### **Slacker**

Alex is a sophomore in a Quantitative Analytical Chemistry lab. He is so different from other students. He clearly has trouble working with others and vice versa. While his group members busy prepare solutions, he never helps, and wanders over to talk with the TA, asking whether there are any more homework or lab reports to return. After the experimental part is done, with his workstation totally a mess, he doesn't know what to do next. His group members don't want him to do anything. If he does some part of the experiment, he creates more problems than he solves. His partners all think it's much faster and productive to finish by themselves than ask Alex to do anything.

As far as his TA knows, he contributes little effort to the group lab report. But all group members get same score on their lab report and lab part of the course. His group members think it's unfair to them that Alex gets almost the same grade as they will but never does anything helpful.

### **Sleeping Beauty**

"Cinderella", provided her biology TA with medical documentation about a health problem. She always seems tired. She puts her head down on the table during experiments and sometimes drops off to sleep. When Ray, her TA, asks her wake up and participate in the experiment, in which her other three group members are conducting, she glares with disgust and expects him to be sympathetic and leave her alone. Ray cajoles her saying, "They need your help."

Cinderella scoffs, "They seem to be doing fine. They don't need my help." Despite her lack of participation, Cinderella places her name on the group activity sheets and expects to get full credit, apparently without complaints from the others in her group. Ray's constant requests for this sleeper to wake up and participate are becoming a side show distracting other students. Apparently, Cinderella believes she is protected by the doctor's note and entitled to special treatment. She is on good terms with the course supervisor, who in her mind overshadows Ray's authority.

### **Slow but Diligent Student**

Mark, an aspiring pre-med student, received high scores on Exam 1 and Exam 2 in General Chemistry. He seems to enjoy chemistry. It is evident from his performance both in lecture and lab that he spends a great deal of time studying for the course.

Although Mark exhibits many traits of the "ideal" student, he is usually the last person to finish his experiments and often is late leaving the lab, which causes problems. The next class can't enter the laboratory until all students from the previous class have left. Also, his teaching assistant, Jake, has a seminar to attend almost immediately after lab and doesn't want to be late.

Mark works hard and despite his late departures, is well prepared. His pre-laboratory assignments are always good, which shows he has read the experiments in advance. He may work at a slower pace than other students to ensure that he does not make a mistake. However, Jake thinks Mark needs to realize that completing tasks in a

timely and efficient manner is an important skill that he will need to rely upon as a college student *and* as a practicing physician.

One day after all the other students had finished and Mark was just starting to clean up, Jake said, "How do you expect to be a doctor at this pace? Your patients will bleed to death before they are treated."

Mark, taken back a bit, replied, "I want to do good in lab. I try my very best. Isn't that what you want?"

### **Slow Professor**

Jackson is a first-year graduate student and a first-time TA in CHEM-100. At the first TA meeting, Prof. Cosmo, who teaches the 100 lecture, explains the basics of how to run the lab. She explains the basics of grading and that the proper places to enter your grades is into a computer in the basement. She promises to have the Excel grade sheets up by next week.

Next week the TA meeting arrives and Jackson is ready to put the grades from his first lab into the computer. When he gets to the class and asks Prof. Cosmo if the grade sheets are up. She says that she wants to wait another week until she has the final rosters. But several weeks pass and Prof. Cosmo still has not put up the grade sheet. Every time Jackson goes to class, he feels she has another weak excuse for why they are not done.

Eventually after four weeks, she finally puts them up. By this time Jackson has made his own grade sheet on his personal computer. When he asked the professor if he could just use this instead, she said bluntly, "No". This frustrated Jackson very much. Because she had taken so long to add the grade sheets, Jackson had spent several hours preparing his own. Now he was going to have to waste more of his time transferring all the grades into the proper format.

### **Smart but Stupid**

Jeff's TA responsibilities include running discussion group sections and writing/grading homework, quizzes, and exams. Normally during the discussion section, he separates the class into groups of 4-5. Jeff had noticed that one of his students, although in a group, was doing his own work without communicating with his group. Jeff asks Alex to work with his group. Alex's responded, "I'm good, I don't need any help with this material." Jeff replied, "Maybe your group members do."

After joining the group, Alex took it over and let all the students copy his answers without showing them how to work through the problems. Jeff could see that Alex did not have patience for others and was unwilling to explain, what he thought were basic concepts everyone should know.

### **Smart Plagiarism**

The discussion section of Joe's organic chemistry lab report used some very sophisticated words. Whole paragraphs were written with professional, but poorly organized, sentences. Several of the sentences were not even slightly related to the questions to be addressed. Orlando, an international TA, suspected plagiarism. He

showed the report to Dr. Spock who is in charge of the course. Together they Googled the internet but could not find any evidence that the report was copied from the Internet or somewhere else. They both strongly doubted that this was Joe's own work. It may be that Joe had done a poor job of paraphrasing but at the same time made the source impossible to track down. Without any solid evidence, they had to give points to him. Orlando grumbled that this was smart plagiarism.

### **Snide Comments**

Despite her average grades in lab, Wendy displayed excessive confidence in her abilities and knowledge of the course material. She always wanted to finish early and rush out of lab. She seemed inconvenienced by the course. But, that was true of other students as well. What annoyed George, the TA, was that Wendy had a habit of making snide comments during the lab. Once while he was explaining t-tests for data analysis, Wendy said, "I've had all of this before. Can I leave?" The following week while a few lab groups were finishing their first assignment before the class could start the second assignment, Wendy rather loudly said to George, "In case you haven't noticed, we are really bored", in a manner that the entire class heard. The following week the class performed an experiment that involved using a paired t-test rather than the unpaired t-test that had been used previously. Wendy was impatient and insisted on performing the t-test ahead of the rest of the class despite not yet having been taught how to do it.

### **Special Needs**

As the exam neared the end and TAs Peter Parker and Mary-Jane Watson advised the students to begin packing up they noticed one of Mary-Jane's students who was not finishing up her exam. They again told her to get ready and said they would give her an additional 2 minutes to finish up whatever problem she was working on; she did not even seem to hear them. After two minutes she did not hand it in. The TAs began to pack their things and warned the student that if she did not hand in the exam this moment she would get a zero. Once again the student was oblivious and did not hand the exam in. Mary-Jane, upset at the student, exclaimed,

"What's wrong with you? Can't you hear us? Give us the exam now. We gave you more time than any other student, we need that exam."

Finally the student popped her head up and replied,

"I am really offended by what you just said, I have a learning disability and need more time."

### **Speechless**

Gertrude, a TA for a nursing chemistry course, finished proctoring the very first exam of the semester. As she was leaving she overheard a group of students talking about the exam. "I know I failed the exam. I couldn't concentrate at all. Evelyn kept talking to herself the entire time! If she said, 'shifts to the right,' one more time, I was going to set her test on fire!" A second student, "I didn't mind at all. He knows her stuff. I just copied down whatever she said."

Later Gertrude saw Eve and decided to raise the issue obliquely. “How was the exam, Eve?” She responded, “I think I did really well.” To which Gertude said, “That’s great. By the way, I am curious. You seemed to be talking to yourself all through the exam. It might have bothered students around you. Could you try to be a little quieter during the next exam?” Eve was a little hesitant, but she revealed her problem. “I often panic during exams because I have really bad test anxiety. My therapist told me to literally talk myself through the exam and it’ll help calm me down and recall the information that I’ve studied.”

### **“Spirited” Group**

One week, Jim noticed one group in his lab section made several errors in their experiment and even broken some glassware, which was uncharacteristic for this group. He just assumed the group had a bad week. They have happened to everyone.

Later that week when Jim was grading that group's lab reports he noticed that the group’s data were incomprehensible. He decided to quietly inquire at the next lab period about why their unexpected behavior and results. One of the students admitted that before the previous lab she had several glasses of wine and may have been slightly intoxicated. This caused her to obtain the wrong chemicals when running their experiment.

### **Spreading the Word**

Bart was a TA who had worked hard to help his students learn in their General Chemistry laboratory in his first semester. He had come from a small liberal arts college where teaching was highly valued and where professors had supervised the labs. He emulated them and felt he still had a ways to go. It was getting near the end of the semester and he wanted to get some constructive feedback from his students.

Being new, Bart was not familiar with the normal evaluation procedures. Rumor had it that the course and the professors got evaluated, but the TA didn’t. Not wanting to let an opportunity pass and to be sure he got feedback on his performance, Bart designed his own evaluation form and distributed it to the students in his laboratory sections on the last class meeting of the semester.

The comments from the students were very positive as might have been expected given Bart’s interest in the students and the role models he had. What he did not anticipate were the significant number of complaints about TAs in lab courses that the students had in other departments.

Because he had no power to change the behavior and training of TAs in other departments but thinking that it did little good for the comments to fall on deaf ears, Bart decided to share the comments with someone who could communicate them to administrators in the other department.

### **Spring Semester Blues**

Tyler was the TA for a junior analytical chemistry laboratory. Being a new graduate student, he had many things in common with his students and tried his best to give advice where and when it might be useful. He quickly became close to many of his

students. After the fall semester was over, he began hanging out with some of them regularly.

One of these students, Ashley, became a particularly good friend and the two of them would spend hours together. Because he was no longer her TA, Tyler felt no need to stop the relationship from growing into something more. Soon the two started dating. At the start of spring semester, Tyler went to go get his TA assignments. As he looked over the class lists, he became very nervous. Ashley was in one of the lab sections he had been assigned.

### **“Steady Hands”**

One week, students in Mandy’s lab were doing a titration experiment. According to the procedure, they need to repeat the titration three times, and then analyze the data statistically. When Mandy got back and started grading, she found out that several students had exactly the same data for all the three trials. Mandy thought these students must have done only one trial in the lab and simply put down the same data for the other two trials. In this case, they even did not need to do the statistical part, because they could simply put zero for the standard deviation and skip the rest of the questions. So Mandy decided to give them half of the points. Although Mandy did not fail them, that was still quite a low score. Next week, Mandy handed out the lab reports, and she talked to those students about her concerns. However, the students all claimed that they did do all the three trials and the data were really exactly the same. The students complained that it was unfair to get a low score only because they had “steady hands”. Mandy replied, “What is the probability that three students in one lab would get the exact same results for three successive titrations even with steady hands?”

### **Stinky**

Stinky had an “air” about him. From the very first lab you could tell he had arrived even if you couldn’t see or hear him. Jim, the TA, figured that the guy was in intramurals and never showered before lab because he didn’t have time. But on the other hand, he seemed to wear the same rumpled clothes every week with the same stains on them, which made Jim wonder if “Stinky” ever showered. No one wanted to be his lab partner. One of the students suggested discretely that he move his work space to the hood. Jim didn’t know how to broach the subject and wonder whether such a personal issue was something he could confront. He had heard stories of students living in their cars because they couldn’t afford housing and wondered if this was an example.

### **Stone Age Technology**

As a new international TA who had little previous experience speaking in front of people, Lipong was quite uncomfortable in his role as a TA. Due to his accent and difficulty speaking extemporaneously, he found it very useful to just read the PowerPoint slides provided for the prelab. That way he did not get lost. It was a useful crutch. When he took his eyes off the screen and looked at the students, he discovered they were not paying attention. He did not expect this. He thought that students should automatically be interested and pay attention because it would help them in the lab. Something was wrong.

Wanting to do better, the last question on Lipong's first quiz, asked, "what do you think would improve the quality of the lab?" There was a consistency in the responses to that question. Some students said he talked too fast and that they didn't have time to read and understand the slides. Others said that he never looked at the class and thus he never knew when students had questions. They didn't like him standing in front of the computer reading slides.

Thereafter, he went over the slides and summarized them. Then he used the blackboard and chalk to demonstrate key concepts and critical equations. Using the blackboard turned out to be a good pacing device. He began to interact with his students. He felt like he was telling stories, not reading lines. With his gestures and eye contact, the students paid attention.

### **Strong Acid**

Becky, a first year TA for honors general chemistry, went to meet with the professor to go over the procedure for the second experiment of the semester. That week, the students were determining the percent composition of carbon and manganese in different samples of steel. However, Becky was shocked to learn that in order to dissolve the steel, the students were going to be boiling it in concentrated nitric acid. Becky nervously thought to herself "Wait a minute, haven't these kids only been in college for three weeks? Will they even understand how strong of an acid and corrosive this is?" Despite being very uncomfortable with this experiment, Becky did not voice her concerns to the professor because she did not feel that it was her place to question the professor's judgment.

That Thursday, the experiment started out just fine. However, midway through, Becky began to feel a strong stinging sensation on her forearm. She thought it was odd at first, but then quickly realized that it was in fact nitric acid on her arm and that she was the proud owner of a brand new chemical burn. She rushed to the sink and began to panic, "How did this stuff get out of the hood? I don't even know where in the room this is spilled. A student could get hurt!"

### **Student Invitation**

Mike, was a first time TA for introductory microbiology. He is very friendly with his students and they all seem to genuinely like him. Mike thinks his students are nice and everything seems to be going on well in the lab.

One Friday night after finishing his homework, Mike was checking his e-mail. Vanessa, one of his particularly bright and attractive students, had sent him a message telling him how she thinks he's a cool TA and invited him to a home-coming party her friends were organizing. Mike replied telling her he'd made plans to be out of town that weekend, so he couldn't make it to her friend's party.

Time passed without further messages until Halloween. The same student, Vanessa, invited Mike to her friend's Halloween party. In her invitation email she said Mike had to come because it will be very exciting. She also said that because he couldn't make it to home-coming party, he definitely had to make it to this Halloween party.

### Student Self-Instruction

Michael, the TA for Instrumental Methods Laboratory, ran into a situation midway through the semester after his students got back their first exam. He overheard his students discussing how bad they had done on the exam. In hearing this he was shocked considering they had spent the last three weeks in lab covering the material that was on the test. He was amazed to hear this considering how well his students were doing with the experiments. Mike asked his students about the test and quickly realized that his students were not making the connection between lecture and lab. Mike knew that the relationship between the two had never been verbalized but he just assumed his students were making the connection.

To overcome this problem, he decided to spend the first twenty minutes of each lab session having his students present the lecture material that was relevant to the experiment being done. After a few weeks of doing the student “teach-backs” his students came to him after the second exam excited to tell him that they had done much better. And to his amazement, they all huddled around the board and began discussing the lecture material needed for today’s lab.

### Substitute TA 1

Jackie was a second-year graduate student who had finished most of her course requirements and had begun her thesis research. She had liked her experience as a TA during her first year of graduate school and would have happily served another year. However, her research advisor, though supportive of the value of teaching experience, had funding and gave her a research assistantship. He told her, “Graduate school is about research, so you need to spend full time in the lab, if you expect to graduate in a reasonable amount of time.” Jackie knew that and was happy to have grant support for her project.

Jackie’s and her friend JoAnn had met during their first year of graduate school when they had TAed together in the same introductory course. JoAnn also had started research, but her advisor had a big lab and didn’t have enough grant money to support second-year students. As a consequence, JoAnn was serving another year as a TA. Early in the semester, Jackie had offered to take a lab for JoAnn if something ever came up and she needed a substitute.

Midway through the semester, JoAnn had the opportunity to go to a concert in New York if she could get someone to take her Friday afternoon lab. Jackie accepted without a second thought. JoAnn e-mailed her lab section that Jackie would be a substitute TA on Friday.

Jackie quickly read up on the experiment, which was one she had supervised the previous year. She took some time to plan thought-provoking questions and little extras she thought might make the lab more interesting and better for the students. Much to her dismay, things didn’t go as she had imagined. First of all, only a third of the students arrived on time and most of the rest dribbled in over the next 30 minutes. Her planned prelab presentation kept being interrupted by students arriving who had no idea what she had already said. When the actual lab work started, three students had forgotten their goggles and each independently said, “It doesn’t matter, JoAnn lets us do the experiments

anyway.” Several girls working with a Bunsen Burner didn’t have their long hair tied back and another student was caught dumping hazardous waste down the sink. Jackie began to regret her offer and wondered whether she should ignore everything or tell someone.

### **Substitute TA 2**

Fred had encountered a family emergency and knew that he would not be able to cover one of his lab sections. He was the only TA for the honor’s section, which had a few differences in execution than the non-honor’s section. He was not sure whether another TA would feel comfortable handling the lab. Thankfully, Edward agreed to switch labs with Fred.

Fred forgot to give Ed a class roster. Given his class had 22 students, Edward assumed that Fred’s class was the same size and he would just count heads to make sure everyone was there. As the students came in, sure enough 22 were present and Edward continued with class, collecting a worksheet due from the week before. After class, Ed counted 24 worksheets. Fred confirmed that there were in fact 24 students in his section. The next week, no one would tell Fred who had been absent.

### **Supervisor Missing in Action**

Sally’s was a TA in a lab course that happened to be supervised by her research advisor. Although she had a great deal of respect for Prof. Frink, he was very difficult to get in touch with and did not communicate via e-mail. Several times during the semester, Sally was asked by Prof. Frink to do things that normally should be his responsibility. Things like overseeing the grading of exams and managing online documents for data input by the students. Frequently, she had to organize other TA’s for lab prep the day that labs were scheduled because Dr. Frink did not send the lab procedure out until that morning.

Even though Sally felt that these duties were not her responsibility, she was a second year student who did not have as many class commitments as the other TA’s. Furthermore, being in Prof. Frink’s research group made her feel like she had to complete these tasks. It got so bad that Prof. Frink could not be reached to discuss grading lab reports even though he specifically asked Sally to discuss the grading with him before the labs were returned to the students. By the end of the semester, the students had no idea of their standing in the course because they had only seen two graded reports. Sally had to deal with all of the student complaints because Prof. Frink was nowhere to be found.

### **Sweet and Sticky**

Maddie was a laidback Biology TA who loved to joke around with her students and was always trying to keep the labs interesting. It just so happened that Maddie’s birthday was the day after a Friday night lab halfway through the semester. When a student asked about her weekend plans, Maddie told her that she was turning 23 and was going to celebrate. Then Kellan, a freshman in her lab, jokingly asked, Can I bake you a

cake for extra credit?, she replied in a similar vein, "Now that something I might consider", never thinking anything would come of it.

A week later, Renee, who had been struggling in the lab, showed up carrying a large box. "Look what I have for you... Bring on the extra credit!" Inside the box was a beautifully decorated pink birthday cake that Renee had baked herself. Maddie did not give Renee extra credit, but felt bad that her seemingly harmless repartee with Kellan got taken so far.

If that were not enough, in the following weeks, multiple students brought in different sweet treats for Maddie... cookies, cupcakes, all her favorites, which she accepted. She almost felt that the student should get extra credit they desperately wanted. That little voice in her head said that she should put an end to this mouthwatering moral dilemma.

### **TA Alchemist**

Lindsey is an experienced teaching assistant but every semester, when she least expects it, disaster strikes and she has to try to salvage the experiment. One day her students came in, prepared for the experiment. The pre-lab went smoothly and it appeared the majority of the students had a grasp of what was going on. After preparing their samples, the first lab group put their sample into the instrument and collected data.

"Lindsey, something is not right..." one student called out.

Lindsey headed over to trouble shoot the problem. She repeated the procedure herself, step by step, and had the same problem the students had. Clearly the instrument was malfunctioning.

Lindsey overheard the students talking, "What is the point of this? We're just wasting our time." "This is stupid, can't we go home now?!"

Lindsey tried everything she could think of, but the problem persisted. Unfortunately, it was late in the afternoon. Now, the lab technicians, who might be able to fix things, have gone home for the evening. Conscientious Lindsey, wants her students to learn something from the lab and wonders how she can "turn lead into gold."

### **TA-Envy**

"Hello?" Monique confusedly answered her cell phone. She had never seen that number on her caller ID before.

An unknown voice answered, "Um, hi. So for the lab assignment that is due tomorrow, if I used 50 milliliters of sodium hydroxide then how do I find out how much acetic acid I had?" I have been trying to do this all week and my TA isn't helping me."

Monique pulled back her cell phone to see that the student was calling her at 11 pm. "My TA isn't helping me?" she thought, puzzled. "Wait, who is this? Are you one of my students? How did you get this number?" she asked into the phone.

"Oh, yeah sorry." The voice paused, "My name is Tyreece and I'm in Maria's section. I keep asking her for help but she just does the problem for me, or she makes me

feel like an idiot for asking questions. Earl, from your Thursday section is my roommate, and he always says how nice and helpful you are, so I thought I'd call you."

This was happening too often to Monique. The other TA's were neglecting their students so much Monique had received the reputation of the "nice and helpful" TA. Monique felt honored that her students felt that way about her. However, the students from other sections were beginning to call and email her so much, that they were taking time away from her own students. In addition, when the students came for help, they bashed their TAs so much that it made Monique very uncomfortable.

### **TA Friction**

Eva really enjoys TA'ing her Introduction to Biology class. The students are wonderful and, for the most part, respectful. She finds the topics interesting and loves to share her excitement about biology with new students. However, the weekly TA meetings for the lab are the most painful three hours of her week. She dreads them, and can immediately feel her blood pressure rising when she walks into the room. While she gets along well with the professor and the lab coordinator, there is another graduate student, Simone, who constantly annoys her. Simone shows up five to fifteen minutes late to every meeting each week. The other TAs have to sit and wait for her to show up to begin the meeting. Simone also has the habit of interrupting everyone and interjecting her own thoughts and ideas on how the lab should be run, how the assignments should be graded, and how she has done things in the past. These constant interruptions usually make the meetings run over their three hour time. Three of the other TA's, including Eva, have a class that starts five minutes after the time the meeting is supposed to end in a different building, so the delays cause Eva and her classmates to be late for class almost every week. For most of the semester, Eva has been able to hold her tongue. However, one day she had enough, and asked Simone to be quiet when the professor was answering a question Eva asked. This was not taken well and everyone in the room was sort of nonplussed.

### **TA or Friend?**

John comes from San Diego California, far away from where he is a TA in graduate school. Coincidentally, Michael, one of the students in his general chemistry lab, also grew up in San Diego. Being from the same place, they had lots of common topics to talk about. Michael even invited John to join his birthday party, but John could not attend because of a course conflict.

One day, Michael came to lab really late because he felt sick. To complicate matters, he also forgot to bring his goggles and asked John if he could borrow some goggles. John said he was sorry, but there is no way TAs can loan goggles to students and told Michael to go back to his dorm and get his goggles. However, Michael's dorm was all the way across campus, so John told Michael he could make up the lab later in the week. Michael seemed unhappy because he thought loaning goggles shouldn't be such a big deal. He left lab without say anything. After the lab, Michael texted John and said that what John did was inappropriate for a friend. Michael did not arrange to makeup the lab that week.

### **TA Train Wreck**

Matt, a TA in an organic chemistry lab, was utterly unprepared for the volume of student questions and problems that would arise during his first lab session. He was running around trying to help what seemed like the entire class while trying to locate items in a lab he had never been in before. Meanwhile, Karen managed to completely mess up one step of the procedure—she had created a solid where there should be none. Matt had no idea what Karen had done or how to resolve the problem. Matt still had a long line of other students who were already waiting for help, so Matt assured Karen he would get back to her. As he went about addressing the other student's issues, Karen became anxious. She could not continue with the lab until her problem was fixed. Time passed and Matt still hadn't been back around to help her. It was too much for Karen. Unable to complete the lab and feeling helpless, she began to cry and walked out of the lab without a word.

### **Taking It Easy**

Ramona is a first year TA. The attendance policy is that a missed lab can be made up in another lab section, preferably with the same instructor for grading purposes, but not necessarily. If a student is going to be absent from their scheduled lab time, an email must be sent to the lab coordinator and the TA stating the student's original section, why they are missing, and the preferred switched lab section. Switches are approved beforehand by the lab coordinator. Stiffany is a student that isn't in Ramona's scheduled lab section, but has been coming to Ramona's section for three weeks in a row, with a different excuse for missing her original lab section each week. For two weeks the switches had been approved by the lab coordinator. On the third week Stiffany shows up to Ramona's class without prior notice and no email correspondence with the lab coordinator or Ramona. Ramona has heard from other students and Stiffany's assigned lab TA that Stiffany and the assigned lab TA do not get along perhaps because of that lab instructor's reputation as a tough grader. A switch in lab sections requires a great deal of hassle for the TA's and the registrar, as well as an unfair advantage to other students who may feel they deserve to switch lab sections based the grading styles of the TA. It is the policy of the lab that any missed labs can be made up for full credit in another lab section no matter the excuse.

When Stiffany arrived for the third week in a row, Romona asked, "Why do you keep coming back to my lab? Can't you arrange to be in a lab taught by your normal TA?" Stiffany's reply gave Ramona pause. "Everyone knows that you are nice and don't give bad grades."

### **Tattle Tale?**

Every week Olivia held office hours to tutor freshman. One week, when the students had an exceptionally hard problem set, the other TA, Casey, decided to hold extra office hours for the students right before Olivia's office hours. When Olivia walked in, Casey was working through one of the questions on the problem set with the students. Olivia waited quietly and listened while Casey finished the problem. Olivia heard Casey say a wrong answer, or at least Olivia thought it was the wrong answer. Olivia was not sure of the correct answer nor did she want to correct the Casey in front of all the students, so she decided not to say anything.

Later that week the TAs and Prof. Moore began grading the problem sets. While the professor was grading the question that Casey had gone over with the students, she made a comment about how many students seemed to have the same wrong answer. Olivia asked the professor what was the wrong answer. It turned out to be the answer that Casey had given. Casey was not there to admit that she gave the students that answer, but Olivia knew it was Casey. Olivia again was not sure what to do.

### **Teaching $\neq$ Learning**

Thomas was a confident TA. He knew the material and had the mathematical skills to handle any calculation that came up in his introductory lab sections. When his students came to him with a problem, showed them the right way to find the answer. If they were unsure of their answers, he would punch in the numbers into his calculator and tell the student whether or not he got the same answer. He would show students how easy it was to derive the Henderson-Hasselbalch equation, if they ever forgot it. The students felt he was doing a good job and rated him well. However, when Thomas saw the results of his students on their exams and quizzes, he wasn't so happy.

He decided to discuss this with a Prof. Alba who taught a course for new science TAs. After a few minutes, Prof. Alba asked, "Have you thought about the difference between teaching and learning? Just because you know, doesn't mean your students will understand when you tell them."

### **Tears of Despair**

One day a first year TA Tucker was in lab with his students doing a lab that required the entire two and a half hours. Tucker stressed to students to do their calculations before class, yet no one did their work. Tucker made the students do this work before he did the prelab so that they would understand how to do their serial dilutions. Tucker went around to every group to make sure they were able to do their calculations correctly before he would let them proceed. With all six groups demanding his attention and help, Tucker was constantly on the go from one side of the room to another. Tucker noticed that one group of students, that is usually last and asks the most questions, hadn't called him over, so he went over to make sure they were okay. Tucker noticed that their serial dilutions were incorrect and that there wasn't enough time for them to repeat them. However, Tucker stressed, "Even though there isn't enough time you can use the serial dilutions of another group and do your own calculations." At which point, one group member started sobbing uncontrollably, "This class is impossible. There's no way I'll ever pass."

### **Tequila Tiffany**

For his first semester of graduate school, Perry TAed 3 freshmen labs. Recalling how terrible his past TAs were, Perry made it his personal goal to, not only teach his students, but to relate to them as well. He felt that this would allow them to ask more questions, and in general, be more comfortable in what most students perceive as "personal hell", a.k.a. chemistry lab. For 99% of the students, this worked perfectly fine.

One night, Perry and some other TAs went out to a local bar to celebrate surviving another week. After a few hours, Perry noticed a familiar face walking towards him. Guess who? Yup, Tiffany, a freshman from one of his labs. “Well,” Perry thought to himself, “at least she doesn’t see me.” No sooner had he finished his thought, when Tiffany sat down right beside him, placing two shots of tequila on the table. She placed her hand on his shoulder, and asked “shot?” while winking.

### **Terrible Time Tutoring**

Zelda, an undergraduate student working in a research lab with graduate student Zeke, was having troubles in her quantitative analysis course. She appeared to have a good understanding of the concepts, but every time she attempted a problem, she invariably arrived at an incorrect answer. One day she asked Zeke to help with her homework problems. Zeke agreed.

Zeke noticed that Zelda consistently skipped steps. She attempted complicated mathematics in her head and frequently made mistakes that yielded the wrong answer. Zeke decided that Zelda needed to write down every step when doing a problem.

“Why should I write stuff down when I can do this math in my head?” inquired Zelda.

“It’s more helpful to write out every step. That way, if you make a simple mistake, you can easily figure out where you went wrong. It’s much easier than redoing the problem. Additionally, it will help you later on when studying for exams, as you will have the problems all worked out in detail,” responded Zeke.

It took some work, but Zelda was making progress writing down each step. Her quiz grades were improving each week. Initially Zelda had been getting D’s on the quizzes; now she was earning A’s and high B’s.

Then one day a dismayed Zelda came in and showed Zeke her most recent quiz, on which she received a D. Zeke looked it over, and quickly realized that she had reverted to her old way of doing the problems.

“Zelda, you got this grade because you skipped so many steps! You made simple math errors that brought you to the wrong answer. Why didn’t you write out each step?” asked Zeke.

“Well, um, I know how to do the math. I understand the concepts. The teacher is just stupid,” was all Zelda could say in response.

Zelda then left and never asked Zeke for his help again; she ignored Zeke for the rest of the year

### **Terrorizing TA**

The 1000+ students taking the final exam were split up among four rooms, with three TAs to proctor in each room. Portia was in her first year of graduate school with Mike and another TA who were both in their second year. As the students were getting seated, one of the students was trying to joke with Mike. He told her curtly, “I can’t hear you and I don’t care what you want to say anyway”. As the class finished filtering in, it was time to start handing out the exam. “EVERYONE SHUT UP,” Mike yelled and all

of the students went silent. As we were handing out exams, another student mentioned that she didn't have an exam. Mike responded, "It doesn't matter. You'll probably fail anyway." He also told them that, if they had questions to raise their hands and we would come to them, but, if they were in the middle of the room away from the aisles, they were "shit out of luck" because he wasn't walking to them.

The TAs spent the exam on their computers playing games and rarely looked up to the class. In the middle of the exam all TAs received an e-mail from the supervising professor stating that someone in the class complained about the above situation. She had forgotten the name of the TA but named the room they were in and described Mike perfectly. The professor said he wanted to talk to whomever this TA was. Mike asked Portia to back him up when he talked to the professor saying that this was blown out of proportion and support whatever he said.

### **Thanks, But No Thanks**

Mindy was starting her first year in graduate school and was very excited to be a new TA. She had done tutoring in undergraduate and was really looking forward to sharing her knowledge. Her TA assignment was a discussion session for Honors General Chemistry for majors and she couldn't believe how lucky she was. At her first meeting with her TA advisor, Dr. Smith, Mindy soon found that TA experience wouldn't live up to what she expected.

"So what will I be doing this semester?" Mindy asked.

"Well, to tell you the truth I don't know. I didn't expect to have a TA and was planning to teach the discussion session myself." Dr. Smith replied.

Mindy offered to do whatever was needed.

"I can grade papers."

"No, I don't like having TAs grade papers because I always have to change the grades. It is more trouble than it is worth." Smith answered back.

"Well I can help you with the discussion session." Mindy offered.

"No, there is no need for that."

"Well what would you like me to do?" Mindy asked getting a little frustrated.

"I don't know, I'll figure something out and get back to you."

So Mindy left a little disappointed and unsure of what she should do. Eventually, Dr. Smith decided to let her run a study session once a week, but no one ever showed up.

Mindy realized she was lucky because she had more time to focus on her own work, but she was still feeling like she was missing out on a big part of the graduate school experience.

### **The Boss's Daughter**

During his first semester of graduate school, Tim was assigned to be a TA for BIO-101 lab. Much like his fellow graduate students, he was eagerly looking for a research group to join. When he got the rosters for his lab sections, he noticed that one

his students, Jane, was the daughter of Dr. Baker, the professor he was most interested in working for. He was excited about the opportunity of working with her because, being the daughter of such a prominent biologist, he figured she would have a great aptitude for the subject, and it would give him a chance to make a good impression on Dr. Baker.

Jane did well on the first lab, but as the labs got progressively more involved, she started to do worse. Tim tried to help her as much as he could, but there were 20 other students in the lab, and he did not want to appear to show favoritism towards any one student. What made it harder was that Jane asked very few questions of Tim, and often just handed in poorly done lab reports. He was sure to encourage all of his students to ask questions when they were confused, hoping to reach Jane through this, but the situation did not change.

As it got near to the end of the semester, Tim became more and more interested in working for Dr. Baker. However, many of Tim's fellow graduate students were also interested in working for Dr. Baker, and he was concerned that if he reported low grades for Jane he would not be accepted into the research group. Since he had not yet handed in lab grades, and the professor never actually saw the labs Tim handed back, he considered inflating Jane's grades since it could better his chances, and no one other than he would ever know.

### **The Early Bird Gets the...Grading?**

New TA Al Bumin started up the semester excited about teaching. He prepared all of his lessons well ahead of time, and even typed up an introduction about himself to share with his new students. Having had a great mentor during his undergraduate experience, he hoped that he would be able to help his students learn as much as someone had once helped him. Al looked forward to teaching each week and worked hard to make sure his students understood the material.

Unfortunately for Al, part of the responsibility as a teaching assistant was also grading. He was taking several classes and had already begun a project in his lab by the time teaching started. Al also worked with a professor who wanted the grading done well ahead of time, and expected grade sheets to be turned in several days before the students would get the materials back. This meant that Al had only three days to grade all of the assignments for each week and was quickly overwhelmed.

Although he was occasionally granted reprieves for his own exam weeks, and he enjoyed working with this faculty member, he was jealous of the other TAs who had worked with faculty members without such expectations.

### **The Last Straw**

Miki had always thought of herself as being well-organized. She did her assignments on time, planned ahead, and never pulled an "all-nighter" in college. A roommate once gave her the nickname, "Hoover", because she wanted to vacuum their room all the time. Her first semester as a graduate student and a TA tested her self-image. The courses were harder and more was expected. Her social life hardly existed. Her apartment, which started out neat, looked like a tornado had gone through with dirty

dishes in the sink, papers lying around, and laundry in a corner waiting to be washed. Nevertheless, she worked hard to keep her private life separate from her school life and made a point of having control of the teaching laboratories she supervised.

One week, there were four piles of homework and lab reports to hand back. Because of her busy schedule, Miki hadn't had time to sort the homework and lab reports according to students' names before lab started. So she was sorting them during the lab and handing them back to students. However, the experiment was difficult and students asked her a lot of questions. Consequently, she had to rush through the sorting between frequent interruptions and felt very frazzled. At the end of lab, she found out that some of the homework and lab reports were missing. The only thing she could think was that in her rush, some papers had stuck together and she had given some of the work back to the wrong students. Although the students were understanding and seemed to take the mistake in stride, Miki did not. After the students had finished and left, she put her head down on the lab bench and cried.

### **The Lecture**

Every week "Mr. Excuse" showed up for lab unprepared in some way. First, he hasn't read the lab: "I didn't know what lab it was, the e-mail was unclear." Second, he didn't have googles: "My little brother broke them." The next week he didn't print his prelab: "My printer was broken and I have been trying all the printers around and none of them work." In addition, he is a terrible lab partner, who never does anything right and is careless. He is more focused on trying to suck up to Susan, his TA, than focusing on the lab activity. He has already made Susan aware that he needed accommodations for attention deficient disorder. He seemed to be under the impression that ADHD gave him license to wander around in the lab during the lab demo.

Susan debated how to handle this situation, she was not Mr. Excuse biggest fan personally and did not want to make it seem personal, but his behavior was extremely frustrating. Finally, Susan got fed up and took Mr. Excuse into the hall and let him have it. "These excuses are not sufficient. Things happen. It is part of life. You are in college now. It is your responsibility to show up on time with everything you need, period! Leave lab now. Come back when you are completely prepared. No excuses. I want to make it clear, this is not personal. It is for your benefit. This is not the only class you must be prepared for. You need to learn this lesson now. Otherwise, you will be a junior with a paper worth half your grade due and your printer will die. Then you will go to your professor at the deadline time and give him an excuse and he will tell you, 'tough, you get a zero.' Learn this lesson now with an insignificant lab grade, not later."

### **The Nontraditional Student**

TA Homer noticed Monty Burns, a nontraditional student, in his lab section. Monty was significantly older than the rest of the students in the lab section, and his communication skills were sub-par. Monty's words were often slurred and misinterpreted, and his old age prevented him from writing. While the other students quickly found laboratory partners, Monty struggled to find someone to work with. Homer noticed this, and asked two kind-hearted females if they would mind working with him. Agreeing, the girls and Monty went to work on their lab. Homer came back

often to check on their progress and group dynamics. It was clear that Monty was slowing down the group since Monty's limited mobility prohibited him from doing many common lab techniques.

After the laboratory Homer pulled the girls aside: "I noticed Monty was slowing you two down, and I just wanted to make sure you were comfortable working with him." One of the girls responded: "We don't mind working with him, but he does seem to get frustrated that he doesn't get to do much." Homer realized the girls were among the most tolerant in the class and asked them if they would mind working with him next week as well; they willingly agreed.

Laboratory started as normal the following week and things appeared to be going well. Homer was helping a group when he noticed a loud thumping sound coming from the other side of the laboratory. Looking over he saw a belligerent Monty Burns pounding on the lab bench while verbally scolding his lab partners. "YOU'RE NOT DOING THIS RIGHT!" Monty shouted as his shaky, ungloved hand violently ripped an acid-filled test tube away from his lab partner. "LET ME DO IT!"

### **The Shirker**

Peter missed a lab quiz. Cassandra, his teaching assistant, told him to get a doctor's note, asap, so that he could take a make-up quiz. A week later she got an email from a doctor at Health Services confirming that Peter was sick. At lab the following week, she told Peter that she got the email and that he could make up the quiz during her office hours on Tuesday or Thursday.

Peter didn't show up on either day and at the following lab Cassandra asked, "Where were you?" Peter said, "I lost my keys and was look for them during your office hours on Thursday. I didn't know your email address, so I couldn't contact you." Cassandra didn't buy it. "I gave everyone my e-mail address on the first day of lab. I also gave out my office phone number. Your doctor emailed me, so you must have given my address to him." Peter went on to suggest that the doctor found Cassandra's address in the directory—something he could have done himself, if he really intended to contact Cassandra.

Because of past issues with Peter, the Cassandra wonders if she would accept this excuse from another student, but not from Peter. Peter has been late, shown up unprepared, and has used many excuses to get out of having penalties for this behavior. She knows that he's a shirker and worries that now she won't know when his excuses are legitimate from when they are fabricated.

### **The Wrong "Right" Answer**

It had been a tough week and the students in Jon's General Chemistry labs weren't making it any better. While the labs often end well before three hours were up, this week's lab was a long one and the students had considerable difficulty. After giving his pre lab lecture, the students worked on the pre-lab exercises and then began the lab experiment. After two and a half hours, several students were complaining about the length of the lab and Jon, being in a bad mood already, became a bit agitated.

During the lab, he normally would help the students by trying hard to lead students to answers without blatantly giving them the answer. After the three hours there was only one group left in the lab. Jon went over to the group and asked if they needed help. They told him that they were working on one last question. At this point Jon had a long day and wanted it to be over as soon as possible. “What question is that?”, he asked thinking he could help them finish up quickly. “It’s the calculation of the diameter of a Silicon atom,” one student responded. Without thinking, Jon blurted out, “Oh, that’s 1.76 Å,” an answer he thought was correct. In retrospect, he regretted not helping the students work through the calculation, but then he figured it was just one question and that it was just one group. Unfortunately, he had provided the students the wrong answer to the question.

Several days later, Jon graded the labs and marked as wrong the answer to the question that he had given to a few students. At this point, he had forgotten that he was the one that gave the students the wrong answer. At the next lab he returned the students’ lab reports. The students that got the wrong answer from Jon complained that they shouldn’t have gotten the points off because he was the one that gave it to them.

### **Thick Skin**

“Even though flash cards are allowed it does not mean you can sit up here and read directly from them.” Sinister, the first semester TA, warned the students before they began their poster presentations. Even with the warning students still buried their faces in the cards. Sinister told students he would be taking off points for knowledge if they continued to read from flash cards as well as points for presentation and for avoiding eye contact. This caught the students’ attention and they began to rely less on the cards and more on their memory. Gerber, a freshman who was normally over prepared, was having trouble presenting without the flash cards. Sinister advised, “If you absolutely need the flash cards use them. The points I am taking off will be less than if you cannot present at all.”

“I can do just let me start over?” asked Gerber. After two more reattempts at starting over, Sinister strongly suggested that she use the flash cards. Gerber began to cry uncontrollably. “I am sorry I was up until 4 am working on the poster. I have a math test tight after this class. And I had to redo Laggard’s part of the poster.” Gerber also gave other excuses. Sinister tuned out. All he could focus on was the fact that he made this innocent little girl cry. Sinister always had trouble knowing how to respond in such situations and seemed unsympathetic when he said, “Those are the rules,” and walked away.

### **Three Peas in a Pod**

JJ made it very clear in the first lab of the semester that the entire experiment must be finished in pairs or individually before leaving lab. In the first two labs, as she had instructed, every student had a lab partner, worked in pairs, and shared their data. However in the third week, JJ found that three students had shared the same data. It was unexpected, but she still gave credit to the three students. She also sent emails to them reminding them of the rule. However, in the next week’s lab, when JJ was evaluating the paperwork of her lab, she discovered those three students again handed in their lab-report

with shared data. This annoyed JJ who gave all three students zero credit for lab-report section, and asked them to come to see her during the office hours.

When they met JJ, she reminded them that the rule was set by their professors, so every student must obey it. She also asked them the reason why they did that. Sara, one of the students, answered that since her partner transferred to another lab, she felt the experiment was too difficult for her to finish alone. She worked with another two students. JJ was unsympathetic and said that the students who had that problem should come to see her during the lab, and not make the decisions themselves.

### **Time Confusion**

Henry approached the professor several times to reschedule his first mid-term exam because of a class conflict. Furthermore, due to a disability, he was entitled to get extended time for the exam, up to three hours. He was told to start at 5PM. The exam time was different for different students and Henry got confused. He didn't come for the exam until 6PM.

It was Celine's first time proctoring an undergraduate exams. She was an international student and she was responsible for Henry's section. It was a mixed section with students having three different exam schedules, one started at 5PM and ended at 7PM; one started at 6pm and would end at 8PM, and another was for those students who have extended time, they should start at 5PM and end at 8pm. As an international TA, she was careful to talk with professor and make sure she knew all the schedules and transfer times.

Celine handed out the exams for the late students and exam started. Everything seemed to go smoothly. The first section ended at 7PM and students left. It's 7:30 and there was only half an hour left for the late section and here came the problem. Henry asked Celine for extended time and she was confused. At the moment, the professor showed up and told Celine to bring Henry back to his office to finish the exam, but she didn't understand it completely. She didn't know Henry started at 6PM but not 5PM. So she took away his exam at 8PM when all other students handed in their exams. It wasn't until the next morning that she realized her mistake.

### **Time Delay**

The course syllabus states that any student who is more than 15 minutes late can't receive credit for the day's lab. On the 3rd week of the semester, the TA, Abigail, started the lab on time at 2 o'clock. She had gone through two group activity sheets and started explaining the third when Ellen walked into lab, 45 minutes late.

When Abigail dismissed all of the students at the end of lab, Ellen came up to Abigail to ask if she could hand in the first two activity sheets she had missed, which she had copied from her lab partner. Abigail said, "No, you came in 45 minutes late to class, so you don't receive credit for today's lab." Ellen insisted that she had only been 10 minutes late to lab and it wasn't fair that she was losing points. Abigail reiterated that the class had already finished two activity sheets by the time she came into the lab and she was 45 minutes late. Ellen told Abigail that she couldn't believe that she was losing

points for only being 10 minutes late, slammed her lab notebook on a lab bench and stormed out of the lab without picking up any of her graded assignments.

Later that week, Abigail received an email from Ellen saying she had thought the lab started at 2:30 pm and that she was indeed late to class. She also said she was still getting used to her schedule for the semester and asked if there was a way she could still get the points for the lab.

### **Time to Go Home**

Students work at different paces. Some TA's find it frustrating to wait for that last lab group to finish up, but not Libby. When only a few students are left in lab, it gives her a chance to get to know them better and provide more personal instruction to those who have difficulties. In her Thursday morning labs, Libby had two students, Andrew and Chris, who were always the last ones to leave. They worked well together and did well on the labs, but they took their time performing the experiments. One day during the Limiting Reactants lab, students had to dry their product in the oven. Andrew came to retrieve his sample with the tongs. He went to place the evaporating dish in the desi-cooler that Chris held, but the evaporating dish slipped out of the tongs and crashed to the floor. There was no salvaging the evaporating dish or the sample. Libby cleaned up the mess and told the pair to just use a duplicate set of data from their two other trials. Libby reassured the partners not to worry and they continued with their work.

When it came time for Andrew and Chris to get their last sample from the oven disaster struck again! This time Chris removed the evaporating dish, but he did so before Andrew was ready with the desi-cooler. Andrew pushed the desi-cooler towards the evaporating dish, but it was too late. The dish was once again disintegrated on the floor. Frustrated with their clumsiness, Andrew and Chris turned to Libby for help. Libby just joked, "You guys can go home". Another student overheard her and disparagingly said, "That's all it takes to leave?!" Libby was afraid she had given her students the wrong impression.

### **Timed Out**

Josh is a TA in a General Chemistry Laboratory 101 that begins every Friday at 3:35 pm. The first thing he always does is instruct his students to get their unknowns from the stockroom, label them properly, and place them in the back of the lab. It is important for the students to complete this task first because the stockroom closes around 4:00 pm. Once all of the students returned to the classroom, the Josh distributed a quiz, which was announced the previous week in lab. He gave the students the instructions and told them they would have twenty minutes to complete the quiz. Ten minutes later three students, Kaitlin, Liz, and Stephanie, walked in. Once they picked up their unknowns, they were given the quiz and the instructions on how to complete it. Five minutes later, Josh said, "Time is up," and began collecting quizzes. Reluctantly, Kaitlin, Liz, and Stephanie turned in their quizzes with everyone else. After lab, the three girls complained to Josh that it was unfair that they only had five minutes to complete the quiz, while everyone else had 20 minutes. They said if they failed, it was his fault for not allowing them more time to take their quiz.

### Time's Up

Every Friday afternoon at 2:00 Jacob gave a short quiz to his biology lab section on the topics covered that week. By having the quiz at the beginning of lab, it encouraged students to come on time. Although designed to take less than 15 minutes, Jacob gave the students until 2:20 to go over and check their work.

Ester, a first year chemistry major, never handed in her quiz ahead of time and Jacob routinely had to ask for it after everybody else had finished. One Friday, Jacob told his students, "Time is up. Please put down your pencils and turn in your quizzes." Usually Jacob was fairly lenient if some students had gone over time by one or two minutes but when the final call was made to bring the quizzes up, Emily, a fellow student, saw that Ester was still furiously trying to complete the last question and protested to Jacob, "Are you going to get let her get away with that? I wasn't done either and could use more time too!" At that point Jacob went over to Ester and said, "Sorry, I have to take it now!", and literally snatched it from her grasp.

Emily, annoyed that Ester had received more time, quickly followed Jacob to the front of the room and aggressively asked him, "What's the answer to the last question?" He explained the solution. A scowl broke out on Emily's face. "That's the way I was doing the problem when you collected the quizzes. If you had given me more time, *like you did for others*, I would have finished it with the right answer. Please, give me my quiz back and let me finish it." Jacob refused, "No, the time had expired." Later that day Jacob felt that maybe he was a bit too harsh on Emily and that Ester was his real problem.

### Tissue Time

Before the start of the first lab of his chemistry TA assignment, Nasser noted that one of his students, Tricia, didn't have goggles. As instructed ahead of time by the course coordinator, Nasser sent her back to her dorm to get her goggles because she would not be allowed to begin the lab until she had them. The lab activities were pretty simple so most of the students finished early. As it turned out, Tricia had delayed buying goggles because she had spent all of her money on books. After borrowing some cash and running to the bookstore to buy goggles, she had lost the first hour of the lab. Now, having missed the prelab discussion, she was experiencing difficulty with the questions on the lab sheet. Meanwhile, Nasser was anxious to leave since all of the other students were cleaning up. He impatiently asked Tricia how the lab was going for her. Somewhat despondently, she said she was trying to work quickly, but, without a lab partner and the time she lost, she couldn't work any faster. Nasser, somewhat unsympathetically said, "That's tough, You have less time because you forgot your goggles, and you don't have a partner because there were an uneven number of people in the class and everyone had begun the lab by the time you came back". Tears welled up in Tricia's eyes as she looked at the floor, and whispered, her voice cracking, "You don't understand. I am trying. I thought TAs were supposed to be helpful."

### **To be Good, is Not Always Good!**

Ayong is a soft-hearted, international TA. She received perfect 10/10 scores in her evaluations for the previous three semesters. Despite of her really overwhelming schedule, she always reached out to her students to help them. One day, her student Julia arrived in lab with her shoulder in a sling. “I broke my shoulder and can’t do the experiment. Would it be okay for me just to observe?” Ayong thought that was reasonable and asked the rest of the class, “Julia has a broken shoulder and can’t run her own experiment. Would someone be willing to work with her?” James, a more than close friend of Julia’s offered, with Ayong’s approval, to do all of the lab while Julia watched. At the end of lab, James asks, “Can we work together on writing the report? Ayong agreed without much thought.

Later, after Ayong had graded the reports and was returning them in lab, she asked James and Julia. “Why did you submit a single report under both of your names?” Julia responded, “We asked if we could do this together and you said ‘yes’”. That is not what Ayong intended. “No! I just meant that he can help you in brainstorming, and, if required, in typing your report. We need to see what the Prof. Martin thinks about this.

Ayong told the whole story to Prof. Martin and he then talked to both of the students before getting back to Ayong a few days later. “Ayong, The students said that you were unclear in conveying your message. So let’s not drag this case further. This is not an issue for Student Judicial Affairs because it is your mistake. It was nice that you let the students work together under the circumstances, but you needed to be explicit in your expectations for the lab report. Ayong left the room with tears in her eyes feeling like Prof. Martin thought she was a bad TA.

### **Too Close To An F**

Athena teaches an upper-level lab for seniors. The laboratory is a required for graduation and is only offered once a year. Athena’s section runs during the evenings once a week and does not end until 10 p.m. or later, depending on the experiment. Because the lab runs so late, Athena is not usually available after the lab. Consequently, she tries to make herself available during other days, and encourages her students to email or call if they have any questions about their lab reports. Athena would like all her students to do well in the lab; the students, however, have different aspirations. Icarus, a bright student who always answered her questions in class, received a low C on the first lab report.

“Awww, it’s just a one-credit class”, Icarus had said, when asked about his poor report. “I only need a C to pass. Besides, I’m more concerned about my classes that are worth three or four credits. One C is not going to hurt me.”

Given his attitude towards his reports, Athena did not mention anything about the subsequent grades Icarus received. She watched his grades closely and he maintained his C average without any difficulty until about midterm. Then Icarus’s grades began to slide further down. He became increasingly concerned as more reports were returned with a D or lower grade. The possibility that he might fail the lab became quite real. Despite Athena’s best efforts, Icarus continued to do poorly in the lab.

“Really,” pleaded Icarus, “Do I need all this information? I mean, it’s not like it’s research or a job. Why do I need to do all this work for one credit?”

### **Too Cool for School**

Sophia, a friendly and helpful international TA, took time to listen to what students had to say and respond thoughtfully. She routinely walked around lab asking groups questions and making sure her students understood what they were doing. One of her labs had computer simulations in which students had to interpret data using simulation software. Towards the end of lab during the question-answer sessions, Grace, who was a senior bioengineering major called out to Sophia to ask a question. When Sophia went over, Grace angrily said, “Attending this lab is humiliating. I am a senior. Why should I be expected to run computer simulations? Tell the professor that this lab was a complete waste of my time”. She then packed up her belongings and walk out of the class.

### **Too hard for me!**

Steve was a new TA who had been assigned to do recitations for organic chemistry. A large number of students attended the recitation the day before the second midterm. After Steve handed them problem sets to work on, he noticed one of the students was crying quietly. He approached her and asked, “What’s the problem?” She said, “It’s nothing.” Steve thought it might be a personal issue, so he did not persist.

After 30 minutes, as he was walking around he looked at her page and noticed she hadn’t written anything. So, he asked her, “Still working on the problems? Do you need help?” When she raised her head, he noticed her red and puffed eyes. She answered: “This is too hard for me! I can’t solve any of them! I am going to change my major tomorrow!” Trying to calm her, Steve replied, “Don’t decide so quickly, you can do this. Which part do you not understand? I might be able to help you.” She said, “None of them, I did poorly in the first exam. If I mess up again, I am going to fail.” She started crying again. Then, she packed her things and left...

### **Too Little, Too Late**

In a sophomore organic chemistry lab, students must write a lab report consisting of a Purpose, Procedure (written before lab), a Table of Reagents, Observations and Procedure (performed in the lab), and a Conclusion or Discussion. Joe, the TA, gave the students a sample of how to write a lab reports on the first day of lab. After the first lab, Joe gave back the reports with more comments and did it again in the following weeks. He noticed that one of his students, Phil, had not progressed through the semester. During one of the last labs, Phil asked Joe, “Why don’t you ever give me 10’s or at least better than 5’s on my lab reports?” Joe thought to himself, “How can he ask this when he never follows the directions? Doesn’t he ever read the comments I write on his reports?” Before Joe had collected his thoughts to respond tactfully, Phil added, “I have been working with Carrie for the last three weeks. I don’t understand why she always gets better grades than I do and my grades never improve.”

### Too Much Time on Task?

Hiro is a first-time TA teaching an upper-level physical chemistry lab for Dr. Suresh. The students in his lab have taken some tough chemistry courses in their previous years and have a pretty good understanding of chemistry. As a first-time TA, Hiro is also taking a pedagogy class, *Introduction to Laboratory Instruction*. In that class, Hiro has learned that a good TA makes his students think by asking probing questions and by not giving away answers that the students should be able to figure out for themselves. This helps them become better chemists.

Hiro uses this approach in teaching his labs. He finds that most students are more than willing to understand the concepts involved in the lab and respond well to his style of answering questions with another question. The problem arises when the labs are beginning to go an hour to an hour and a half past the scheduled time. He doesn't mind and attributes it to the fact that the students are asking the right questions and understanding the lab rather than just going through the motions. As he had learned, "time on task" is one of the best predictors of learning.

However, one student complained about missing an appointment because the lab went overtime. Dr. Suresh became concerned and told Hiro he should be completing the lab within the 3 hours noting that Sylar, a more experienced TA, is completing the lab within the allotted time. It seems to Hiro that Sylar only makes the students go through the motions of the lab and does not challenge the students to demonstrate their knowledge.

Hiro reluctantly follows Sylar's example, but worries that his students will be deprived of important learning. Deep down he feels that Dr. Suresh really doesn't know what is going on. After all, Dr. Suresh has never stopped by to observe him teaching.

### Tough Grader

Nicole is a TA for a chemistry lab where the grades depend more on the students' *precision* than on their accuracy. Before beginning each lab, she reminds the students that their data should group well together (low RSD), and that if it doesn't, they should stay and redo however many trials are necessary to achieve precise results. Unfortunately, on some of the more time-intensive labs, they just don't have the time to perform extra titrations, and must use whatever data they have collected.

The TA's are not given the grading criteria for the labs before the lab reports are due, and thus have no idea how stringent the precision requirement will be. The students always want Nicole to tell them a number to "shoot for"; they want to know the upper limit of error that they can have before they lose points. One day she said, "I don't know, but typically if you have an RSD of less than 1.0, you will get a good grade." Sadly, the actual grading criteria were much stiffer at less than 0.5, and some students who thought that they would receive full credit for their work actually received only half credit. They were really upset. Harvey said, "You told us that an RSD of less than 1.0 was good enough. We should get full credit." She tried to explain that the professor set the grading criteria, and that she had no idea what they would be, but it was no comfort to them.

### **Tough Situation**

Helen was a TA in three sections of CHEM-100 during the fall semester. At first, everything seemed to be running well. However, after a couple experiments, she noticed that one pair of students in her night section, Dan and Jim, didn't do the experiments at all. They pretended to be doing things, waited for the other groups to finish, and then asked for their results or simply made up data.

In one experiment, after two hours had passed, they had yet to stand up to get any chemicals from the cart. They just sat there asking around. Helen asked, "Dan, how is your experiment going? ...any questions?" He showed Helen his data sheet which was mostly blank. Helen tried to help them and encourage them to do the experiment. Later she said, "Well, Dan, Jim, your data seems a little bit off. Could you please tell me how you got it? What procedure did you follow?"

Dan got angry and pushed his lab manual away rudely to the lab bench corner. Helen didn't know what to do. She felt she was losing control in front of the whole class. She responded, "What going on with you guys today? This is the lab. Your data comes from the experiment, not anywhere else. You guys have to do it." An annoyed Jim said, "We'll do it, just be patient!" They stood up and got some chemicals from the cart. Around 10 minutes latter, they turned in their lab report, Just before left, Dan said very loudly in front of the whole class, "Helen, see you next week, I cannot wait!"

### **Traffic Troubles**

It was Elena's first semester as the TA for Field Ecology. This upper-level biology lab was scheduled from 12:20-5:20 PM one afternoon a week. Many of the laboratory sessions were scheduled as field trips to surrounding natural habitats. Midway through the semester, the students went a trip to the Chesapeake Bay to observe an environment where salt and fresh water mix. It took the class a little over an hour to reach their destination. Once the data collection at the estuary was complete, the class began their return trip to campus. About halfway back, the students got stuck in traffic due to an accident. It was apparent that they were not going to make it back to campus on time.

Josh, one of the students in Elena's van, became very restless. Elena asked Josh, "Is everything alright?" "Not really", he answered. "I have a midterm in chemistry that begins at 5:30 today. I don't think I'm going to make it there on time. My professor already said that there were no excuses for being late, so he probably won't even let me complete the exam." Elena didn't know what to say in response.

### **Transfer Student**

Willy came from a tough background. Despite his mediocre high school grades, his biology teacher recognized his interest and talent in science and had encouraged him to consider college after graduation. That was almost ten years ago. He had tried various jobs including home construction, night watchman, clerk at Home Depot, to flipping burgers at McDonald's. None really satisfied him. He started taking classes at the local community college. He did pretty well and transferred to a nearby University as a biology

major, but continued as a part time student to pay for tuition and help his mom with expenses.

Willy was a bit older and wise-to-the-world than most of the other students in his night biology lab section. In fact, he was older than his TA, Eric, who was a third year graduate student working on proteins in the extra-cellular matrix and their relation to cancer metastasis. Eric was amazed at how quickly Willy picked up techniques and seemed to know what to do when many of the other students had no clue. His questions had substance. While talking to one of the other TAs, Eric said, “this guy is way better than most of the undergraduates who work in my advisor’s research lab.”

### **Translating MSDS**

Amanda had a full laboratory on Monday night. The guidelines were easy to understand: each student would hand in a pre-lab exercise and MSDS for two of the chemicals used in that particular experiment, conduct the experiment, and hand in their results. Amanda was pretty satisfied with the way her first lab went and proceeded with grading the pre-labs. It surprised her that one student did not fill out the MSDS completely. To her, this required no thinking and was a “give away” part of the whole lab assignment. She figured the student was just negligent or lazy, so she deducted points. The following week, the students handed in their pre-lab work and did their experiment. When Amanda went to grade those pre-lab assignments, she noticed the same student did not fill out the MSDS completely. On the third week, Amanda confronted the student only to find he was a new international student.

### **Tricky Thanks**

The whole semester Renee tried her best to help all her students in lab. One of the lab groups, however, required a little more attention throughout the semester. She always had to spend more time answering questions and even helped them study for two lecture exams. After the final exam in lab, one of the girls handed Renee an envelope as she walked out the door. After cleaning up the room, she opened the envelope to find a thank you card. Opening it up, Renee saw a \$5 gift card for coffee. She was extremely touched by the student’s kind gesture and quickly emailed the student to thank her.

Later, Renee told the professor about the student’s nice gesture. After first agreeing with Renee, it then dawned on the professor that Renee shouldn’t have accepted the gift card before final exams were graded. Renee didn’t know what to do. She didn’t want to insult the student by returning the gift but she didn’t want to be accused of bribery either.

### **Triple Axel vs. General Chemistry**

On the first day of lab, Oksana stressed how important it was to be on time for lab. In the second week of lab, when all but Michelle had arrived, Oksana closed the door and started her prelab discussion. Five minutes later she interrupted her prelab discussion to open the door and let Michelle come in. Later Michelle, realizing the disturbance she had made, went up to Oksana and apologized for being late. After apologizing, she told Oksana that she had a tight schedule and it was difficult for her to

come on time from her figure skating lesson at the ice skating rink on south campus. She told Oksana she might be a few minutes late in the future because she has to wait for the bus and sometimes it isn't exactly on time from her figure skating lessons.

### **Troublesome Trio**

The students in Chem132 come from many different majors. Some of them didn't have chemistry in high school and others had poor courses. Therefore, Mindy, a new international TA, has her work cut out for her. She tries her best to explain key points in demonstrations and keeps helping students during the whole lab.

There's one group, Mike, Lily, and Sue, who often titter at Mindy's accent and unfamiliarity with cultural idioms. They chat loudly during labs, and frequently ask Mindy questions that would have been answered in the demonstration period if they had paid attention. When the lab is over, they just sit in the corridor outside to do the post-lab, chatting all the time.

In one lab, their conversation was loud, disruptive, and not about the lab. Mindy said to them, "Please focus on your lab, don't chat!" Mike answered, "We're just waiting for the water to boil! Is that wrong? "

In another easier lab, most students had finished in two hours. But the troublesome trio was still working until the end of three hours. Lily complained to TA, "My friends in other TA's lab told me this should be a quick lab. Why do we use three hours?" Mindy didn't say anything, though the true reason was that they kept talking.

### **Twitter Talk**

As the time passed midnight, the troop of TAs grading the 692 exams from the first hourly were taking a pizza and coke break as they made their final push that would probably take them until 3AM. Jake, who was tired and a bit giddy, went on about all of the ridiculous answers he had read. "Hey, listen to this. This jerk thinks HCl has a pKa of 7.0!" Kyle responded, "You think that's bad, did you know that the mass of a vanadium atom is 36 kg? Now that's heavy lifting for that babe." And so it went with different TAs making derogatory comments about the nonsensical answers they found. It was a sort of dark humor that kept them on task.

Frustrated with the poor answers and wanting to get to bed, Jake came across Julie's exam. He expected her to do well, but her meaningless answer indicated she was totally confused. He put a red line through her answer and wrote "WTF" in the margin. On another page, graded by a different TA, "BS" was written in large letters across an essay answer. These were comments that the TAs had been verbalizing all night.

A couple of days later Professor Hale called his TAs together. "We have a problem. The parents of one of our students has complained to the Dean that offensive and inappropriate comments were written on their daughter's exam," and he gave several examples. "Because this happened in my class, I am being held responsible. I don't know who wrote the comments, and I don't want to know. I suspect this is not an isolated case. Just make sure it doesn't happen again." Jake kept his mouth shut and no one else confessed.

### Uneven Divide

Leandro's intro chemistry class had numerous individual and group assignments. Based on personal experience working in groups, Leo worried that his students might also run into trouble working in lab groups. As the end of the semester approached, Leo was happy that his students had no significant issues with group work with the exception of one group. On the mid-semester peer evaluation, two students from that group were complaining about how the other student, Beli, was dominating their group.

When week 11 came around, Beli came up to him at the beginning of lab requesting to speak with him after class. Beli complained, "I wanted to let you know that the post-lab my group turned in today was mostly my work. One of my lab-mates wrote two sentences for the introduction, and the other one did not write anything at all." Leo asked, "Has this been the case all semester or is it just this post-lab that they didn't contribute?" Beli replied, "We try to divide up the work, but it is almost never even. When they do contribute, I find that I always have to go back and edit what they wrote because it's usually not right and I don't want my grade to suffer. I don't think it is fair that they get the same credit as I do when I do the majority of the work."

### "Unfair" Exam

Every year the anxiety level before the first hour exam in CHEM-103 goes way up. This is the first tough exam that many students encounter in college and many don't know what to expect.

Like other first-year graduate TAs in the course, Liwei was expected to help proctor the exam and grade the exams of students in her lab. Because she returned the graded exams in lab, she was also the first person who had to respond to unhappy students when they discovered their grades were lower than they had expected.

Jane burst into tears when she got her exam back. While her 61 was worth a C<sup>+</sup> and was near the class average, she had received straight A's in high school and was devastated. What would her parents think?

Liwei avoided eye contact and proceeded with her prelab presentation. However, it was evident that few students paid any attention. They were looking through the exam to see what mistakes they had made.

At the first opportunity, Jane came to Liwei. "I studied all weekend for this exam. I took good notes. I looked at old exams. I knew everything we were supposed to know. There is no way that I deserve a 61 on this exam. It really was an unfair exam. Professor Stone loaded it with trick questions. For example, how am I supposed to guess the properties of some element we never talked about? I should get more partial credit on some of these questions. Did you grade those?"

### Unlimited Quiz Attempts

Dave TAs organic chemistry lab for non-majors. Each week the students prepare for lab by filling out a small portion of their lab book and taking an on-line pre-lab quiz that must be turned in by midnight the day before lab. Students can have unlimited attempts. Only their highest score gets reported. Dave observed that even on days when all students have taken the pre-lab quiz, only a few are actually prepared for the lab. The other students just seem to follow the prepared students. Furthermore, Dave repeatedly gets asked questions about the procedure such as “How much do I add?” and “When do I stop?” even though these questions are clearly covered in the lab text. Dave feels that the students blindly take the pre-lab quizzes knowing that they have unlimited attempts and not actually reading the lab. Frustrated, he feels that labs would much more effective if students really prepared. As an alternative, Dave would like to write quizzes that would require to read knowing that they do not have unlimited attempts. However, he is apprehensive about proposing this to the course supervisor because he feels like it would be unwelcome by the other TAs and would add time to the already long labs.

### Urea Challenge

In preparation for the chemistry lab of the week involving the analysis of Lewis structures of about two dozen molecules, Steve recognized that this could be very boring for his students, mostly biology majors, and he didn't want them to get turned off to Chemistry. So he decided he would mention something interesting about each molecule, thinking they could better relate to all those hydrogens, carbons, oxygens, nitrogens, and other atoms strung together on the pages of their lab manual.

Steve's had taken no biology courses in college. His last biology course was as a high school sophomore, so naturally was not very knowledgeable about the biological relevance of some of the molecules. When urea was the next molecule to be analyzed, Steve mentioned that he had read somewhere that there is a trace amount of uric acid and urea present in sweat. Immediately Jason, an intelligent student but with “too cool for school” attitude, challenged Steve's statement. Steve, unsure of this fact that he had read, stated that it could be wrong, it could be right, but it's something to think about and tried to carry on with the lab. But in the corner of his eye, he noticed Jason laughing and talking in a disrespectful tone to other students about what had just happened. Steve did not appreciate the sarcasm, especially coming from a cocky student, and wanted to address the situation.

### Wandering Eye

Sally was very hesitant about becoming a TA for Introductory Biology for non-majors. A social person, she feared that her students would try to take advantage of her friendly nature. So Sally sought to maintain a formal student-TA relationship throughout the semester. However, as the weeks wore on, her students became more and more comfortable, cracking jokes and conversing with Sally like a friend.

Grace was a very loud personality in the class and would pester Sally every week about finishing lab early and would make snide comments about the lab to her group. One lab, while Sally was assisting another student, she caught Grace looking at her TA instructor's manual that she had left on another table. Sally could see Grace was blatantly

looking at the answers for their group activity sheet and writing them down. She immediately went over, closed her manual and looked at Grace saying, "I saw that." Grace, not taking Sally seriously, laughed and said, "What did I do!" and proceeded to return back to her group. This event disappointed Sally greatly. Her hope of maintaining the student-TA relationship was shattered. She was also troubled. She wanted to discipline the student for cheating, but the worksheet was only 2 small points plus she did not want Grace to make the rest of her time teaching a nightmare.

### **Wanted: A Friendly TA**

Gus and Ann are lab partners in a Physical Chemistry. Like many students in the course, they don't have much interest in "pchem". In fact, the way they rush through experiments with little effort to understand the theory, the boredom on their faces, the anger when they make a mistake, makes their disinterest especially evident to Tom Adkins, their "T.A.". They get upset when Tom doesn't explain everything or asks a question in response to their questions.

One day a few weeks into the TA prep class Prof. Trainer asked, "Think of a student in your labs who isn't learning much." (Tom's thoughts went immediately to Gus and Ann.) "Now, what can you do to make a positive difference for that student by the end of the semester?" Somehow that challenge appealed to Tom and he decided to accept it.

At the next lab, Tom spent more time with Gus and Ann with a goal of getting them more interested, or at least be less bored with the experiment. He tried to be more friendly and pay more attention to them. He talked about how the experiment related to their experiences, told them about himself, and showed some interest in them. With this friendly environment, they seemed more involved the experiment. After a few weeks of such conscious effort, Gus and Ann were doing fine, but others were not. He didn't have the time or energy to invest in everybody the way he had with Gus and Ann and he wondered if his effort to help them had actually discouraged others.

### **Wasted Effort?**

Although Thomas attended lab regularly and submitted all his assignments on time, it was pretty clear from the answers he gave that he didn't understand what he was doing. Josh, his TA, realized this and worked with Thomas to clarify the concepts. After two weeks, when Thomas checked his grades on Sakai, he didn't see any improvement and felt discouraged. Josh continued to work with Thomas but Thomas' grades did not improve. He got the lowest lab grade in the class. Josh wondered whether he should have encouraged Thomas to drop the course early on.

### **Wasting Lab Time?**

Lynn always prepares her chemistry pre-lab demo carefully because she thinks it helps student do their own lab more efficiently. However, her students do not think so. They want to skip the lab demo part and get on with the lab directly so that they can

finish early. Lynn tries to explain the importance of the lab demo, but her students do are more interested in getting out than understanding.

Yielding to student desires, Lynn announces at the beginning of the next lab, “As you wish, we don’t have a lab demo today.” Her students are happy and start their lab immediately. After a while, some students, who had wanted to get rid of the demos, come to Lynn with some difficulties in dealing with the data. But she responds, “All the information you need would have been in the demo that you did not want. If you don’t need the demo, then I assume I don’t have to explain it to you.” As a consequence, it takes the students more than half an hour trying to figure out the correct result. They finish the lab at the very end of the allotted time.

### **Wasting Time or Not?**

At the beginning of the lab, “Water Analysis: Determination of Dissolved Oxygen Content,” Helen, the TA, walked around the lab checking students’ answers to the pre-lab questions. The Professor in charge of the lab said that it was important to check the answers *before* talking about the experiment. When Helen got to Marc, Marc said, “I have no idea how to answer the pre-lab questions. Could you tell me how to balance the ionic and net ionic equations?” He really needed help, so she spent about 10 minutes giving Marc some pointers. Meanwhile, the rest of the class began chatting about anything but chemistry. Marc seemed have more troubles than Helen could deal with and now she had to get the whole lab section back on task. Later, back in the TA lounge, Helen asked the other TAs whether it was a waste of time for her to help Marc at that time.

### **Water Everywhere**

As might be expected, Brooke’s anxiety level rose as she walked to her first lab as a TA. Due to drop-adds, students had fled her Friday evening lab and the four remaining registered students were waiting quietly outside of the lab when she arrived. She unlocked the door and let the students in. While they unpacked their bags, she walked around the lab for the first time examining everything. It soon dawned on her that there were no vacuum systems in the lab and she wondered how the students would dry their crystals. “I will figure it out as I go. I can’t look like an idiot”, she thought.

She began the introduction to the lab nervously, but she settled down as she talked. When the time came to demonstrate how to dry the crystals, there must have been a look of horror on her face because Lee, one of her students, raised his hand and said with a puzzled look told her that the lab manual said that a water aspirator was used instead of a vacuum system. Determined to figure out how to use the aspirator herself, she started playing with the tubing while the water was running. All of a sudden, the hose leading to the sink began flipping around and jumped out of the sink, spraying Lee, the counter, and all the notebooks with water.

### **Water Sports**

Jordyn’s lab evening lab section had a relaxed atmosphere. The students were rather extroverted and seemed to have fun doing the experiments. One evening, she

introduced the proper use of pipettes and stressed the importance of following the procedures, so that the volumes were what they expected. Jim and Chad saw possibilities with the new equipment and as soon as Jordyn turned her back, they began squirting lab mates with distilled water. When they shot someone, they began to laugh very loudly.

Jordyn didn't know what was going on at first, but soon found out and put an end to it saying, "Okay guys, you're grown up and should know better. Consequently, I am deducting 5% from your grade for this lab." Jim and Chad were pretty good students and 5% was important to them. They said they were sorry and argued that they should not have points taken off. The whole mood of the lab changed that night. One student whispered to another, "She's just a wet blanket. Can't she lighten up and have a little fun?"

### **Weak Student**

On the first day of lab, Jenny let her students to choose their lab partners. After one lab, Jenny got an e-mail from one of her students asking to switch partners. Her student told Jenny that she was struggling to work with my lab partner. It was difficult for her to teach and explain to her partner every single thing that they have to do. She did the first lab by herself because her partner didn't understand what to do, although she explained it multiple times. The student asked Jenny, "Is it possible to switch partners or make a group of three?"

### **Weathering the Storm**

It was a terrible night to be out with a wind-driven rain that destroyed umbrellas and soaked everything within minutes. Despite the storm, everyone came to Penny's lab on time, except for Amy. Nevertheless, Penny felt a little strange because this was the first time any of her students had ever been absent. She started the lab on time as usual. After the lab, Penny wanted to send an e-mail to Amy, but she was surprised to see an unread e-mail Amy sent that afternoon. "The weather is so bad today. Do we still have a lab today?", Amy had asked.

Penny felt badly that she didn't see this message earlier. The next week, Amy told Penny that she had been traumatized by a terrible hurricane when she was very young and a tree fell on her house. Since then, she was afraid to go outside if the weather was not good. She wondered if her absence could be considered an excused absence.

### **Weeding Out?**

Ethan is a teaching assistant for CHEM-239, a required class that for first year chemical engineers and biochemistry majors. At the beginning of the semester, Professor Stone told Ethan and the other TAs that one of the primary functions of the course was to filter out students who should not be engineers. Jokingly, Ethan asked if each TA had a quota.

A major part of the students' class grade comes from full written reports for each laboratory. Early in the semester, all of the students turned in their lab reports on time. Later on, one of the students, Jerry, stopped turning in his lab reports without talking to

Ethan about it. As Ethan entered grades into a database, he noticed that Jerry had no chance to pass the course.

When Ethan asked Jerry about the missing lab reports, Jerry begged Ethan to allow him to turn them in late so that he could pass the course. Ethan said, "Tough luck. You know the rules. Are you sure you want to be a chemical engineer?"

### **Weighing Without a Balance**

For a two-week lab, students receive a hydrated metal chloride sample mixed with sodium chloride. During the first week, they use a series of qualitative tests to determine the metal in their sample and they do a thermal decomposition of some of the sample. During the second week, using the dehydrated sample from before, they separate the metal (using sulfate) from the sodium chloride. The lab can take a very long time, especially the thermal decomposition portion because they are required to obtain constant weights of everything.

One of Kerrie's lab groups finished much earlier than expected (about 45 minutes sooner than any of the students in the lab earlier that week). Before letting them leave, she checked that they had actually finished all the necessary steps. First the students thought they had forgotten to weigh the crucible. Karrie told them that it would be okay to get the weight during the second week after they had cleaned out the crucible. The students decided to recheck their notebooks and claimed they had found their weights written down in a different place. They were allowed to leave the lab.

When they handed in their reports after the entire lab was completed; the results they had gotten didn't make any sense. The values they used in their calculations gave fairly accurate values, but didn't match the data in the tables in the final report. Some of the data in the report wasn't written anywhere in the lab notebook pages submitted.

### **What Just Happened?**

The microbiology lab started out as usual with the weekly quiz. After the quiz the TA, Sally, began discussing the exercises for the day which included determining the doubling time of *E. coli* via total and viable count methods and also determination of unknown bacterial species. After 30 minutes working on the lab one of the students, Risa, decided to go to the restroom. About 15 minutes later, while Sally was discussing how to inoculate the various media, abruptly a EMT burst in and requested Risa's backpack and other belongings. Sally asked about what had happened to Risa, but the EMT refused to answer. After Risa's belongings were gathered and taken away Sally and her students stood bewildered wondering what just happened.

### **What Lab Are We Doing Today?**

"What lab are we doing today?" If Jacob heard that question one more time, he thought he would scream. "You'd think they would take a look at their schedule and the lab manual before they showed up." Repeatedly he tried to explain to the students that

they should have not only looked this information up ahead of time but also have read the lab prior to arriving to the laboratory. Frustrated, he decided to take a different approach.

At the next lab, he handed out a difficult open-book quiz with questions about the theory of the experiment as well as the procedure. Only students who had prepared could get the quiz done in 20 minutes. Joe complained, "You didn't tell us you were going to have a pop quiz. That's not fair." Jacob noted that being able to take a quiz was part of being prepared and that he could expect quizzes from then on. Joe protested, "The other lab sections don't have quizzes. You're not supposed to write quizzes any way. That's Prof. Moore's job."

### **What's in a Grade?**

The syllabus for a Calculus course stipulates that homework problems are due every week and are a required part of the course. The instructor simply records who turned in home work without grading each, because the class was simply too large to grade them all. She just checks off in her grade book those who did their homework and returns the work with an answer key at the next class. Henry, a bright student in the class, who has extracurricular activities (band, cross country practice) and has little free time, considers the homework to be "busy work" and doesn't hand in any homework problems, yet performs very well. In fact, he gets the next to highest examination average (96.3%) out of 131 students at the end of the course. When he gets his course grade, it is an "F".

### **What's Unfair?**

In order to get her students to think about the experiment they were about to do, Ivy had them look at a figure about photosynthesis that lacked a legend. The students were supposed to deduce what the experiment was all about. They had to examine the axes, determine the independent and dependent variables, and analyze the data.

After distributing the assignment, there was silence. Finally, Ivy asked Gladys, a history major fulfilling her general education science requirement, for her thoughts. Gladys responded, "I'm totally confused. What you want us to do? This doesn't make any sense." Other students in the lab indicated that they also didn't know where to start. So Ivy gave them some clues about how to do it.

A week later in the TA lab meeting, Prof. Greene who taught the course, reported that a student complained to her that that the photosynthesis assignment was unfair to him because in his section, the TA gave no hints about the interpretation of the graph while the TA in his roommate's section gave hints and those students got better grades. Ivy felt upset and she wanted to defend herself. She thought, "What is the role of the TA anyway? Aren't we there to help students learn? Is it better to have everybody fail just to be 'fair'? Maybe what is unfair, is giving assignments meant for biology majors to non-science majors." But, she kept quiet.

### **What's Wrong with this Lab?**

The Diels-Alder Reaction is a standard organic chemistry laboratory. The first part is to prepare the adduct. Jeff, the TA, has prepared fresh cyclopentadiene for the

students. Chris, one of his students, was the first complete the procedure. But even though he put his solution in the ice-bath for a while, no crystals appeared.

“What should I do?” Chris asked Jeff.

“You know, the reaction just took a short while so I think you should do it over.” Jeff said.

“OK.” Chris decided to try again.

But after his second try, again no product showed up. Chris seemed so disappointed.

“Would you like to try the third time?” Jeff asked, “And this time I will be with you.”

Chris nodded.

Jeff kept his eyes on Chris’s whole procedure and found he did it exactly right and very carefully. Now it was Jeff who was full of “questions” in his mind.

“What, do you think, is the problem?” Jeff asked Chris.

Chris said, “My flask might be not clean?”

“It might be, but I don’t think it’s the main problem. Give me a minute to let me think about it and you can write your report.”

Jeff went to other students and he found some others could not get their products either.

### **When Parker Took the Marker**

Swati was a TA in an organic chemistry teaching lab. She came from an East Asian country where few people speak English. Although she was fluent in English, her accent was different than the American accent, which she knew through movies but had never practiced. And suddenly one day this girl finds herself teaching in an American school where she understands her students but they sometimes don’t understand her.

Swati had a tough time adopting the American accent but she was trying her best. One day while conducting a lab, Swati realized that the permanent marker was not in its place and some student had misplaced it while others needed it. So she announced in the class with her original accent, “If anybody has the MARKER, please put it back on the desk.”

The lab went silent for a few seconds. Then a voice with a snide tone came from the back corner table. “MARKER? What’s a Marker? That sounds like PARKER?” The silence broke and the whole lab burst out laughing. Swati, who was a little confused and embarrassed in the beginning, burst out laughing when she realized what had happened. It was Joe who always pulled her leg. Swati then asked Joe how she should have pronounced it, but she never understood where she went wrong. The “Marker Mystery” always remained on her mind whenever she went to lab.

### **Where Have You Been?**

The demands of graduate school took Tina by surprise. She had no idea how much time it took to deal with the daily chores of living on her own, taking courses,

being a TA, working part time on a research project, and trying to have at least a little social life. Being conscientious by nature, she took her TA responsibilities quite seriously and prepared well for each laboratory. It took time, but the students appreciated it and were doing well. Tina felt rewarded for those efforts. After all, that was what she was being paid for as a first year graduate student.

Around the beginning of November, Tina got a stern e-mail message from Prof. Benjamin with the header, “Where have you been?” Tina was working in Prof. Benjamin’s lab and was thinking of doing her thesis work there. The research was interesting to her and the lab mates seemed helpful and easy to get a long with.

When Tina met with Prof. Benjamin, he was not at all friendly. He asked her why she wanted to be in graduate school. He told her that if she wanted to get a Ph.D., she would have to spend a lot more time in the lab and less time on being a TA. The rest of the meeting seemed like a blur as she desperately tried to retain her composure in the face of such a tongue lashing.

She left Prof. Benjamin’s office and burst into tears in the hallway. How could she ever go back to the lab? She wondered whether she should quit graduate school all together. Maybe Prof. Benjamin was doing her a favor by giving her a wakeup call early in her graduate career. Unfortunately, she didn’t have time to talk it over with anyone because she had a lab to TA in 30 minutes.

### **Where Is Your Homework?**

CHEM-115 students have to turn in their homework in their TA’s mailbox before the deadline. Late homework is not graded. As a TA, Daisy collected the homework every time right after the deadline and made a record of it. One day, after giving back homework to students in lab, Joe came to Daisy and asked for his homework. Daisy checked the record. According to her records, she did not receive Joe’s homework at all. Joe insisted that he put it in her mail box.

The course instructor refused to let Joe to do the makeup, because there was no evidence that he had turned in his homework. Daisy told Joe the decision and he seemed really upset. In case Joe had put his homework in the wrong mailbox, Daisy showed Joe the location of her mailbox in person. The next week, Daisy paid more attention to Joe’s new homework, but still could not find it. When she asked him about it, Joe replied, “I put it in your mailbox.”

### **Which Comes First—Lecture or Lab? 1**

Maddy returned in a bad mood to the TA office suite right after she finished teaching her Monday lab, the first lab of the week. She couldn’t wait to find someone to vent to. Unsuspecting, Kenny was there studying when Maddy arrived. “Have you looked at this week’s lab on stoichiometry? It’s a pain. The students don’t have a clue coming in. They said that Dr. Jones is behind and hasn’t lectured on stoichiometry yet. How can the students do a lab if they haven’t had it in lecture?”

Kenny let Maddy go on some more and cool off a bit before he countered. “You know, where I was an undergraduate, we learned about topics first in lab and it seemed to

work really well. Whenever the topic came up in lecture, it made more sense because we had already dealt with it in lab. When you hear about something in lecture, it is really abstract if you haven't any experience with it before.”

### **Which Comes First—Lecture or Lab? 2**

Andrew was a first-time TA assigned to an introductory biology lab with only freshmen. Everything was progressing smoothly throughout the semester and he shared a good rapport with his students. Approaching the end of the semester, the students were doing a 2-hr lab on the cell cycle, DNA replication, and PCR. The students had no formal content knowledge as these topics were to be covered in their lecture at a later time. There were some down time throughout the lab and the students had to complete an in-lab worksheet on how to apply those concepts to new information. Students had numerous questions and had no idea where to begin in understanding the material. Andrew sought to work through the problems on the board, but only confused and frustrated the students even more with simple terminologies that weren't known by students. The lab session had ended and students left the lab without completely understanding the main concepts and how those concepts applied to the lab they were doing.

### **Whining Too Much**

Allied Health majors have a tough time with Quantitative Chemistry lab, but they work hard and TAs learn to be patient with conscientious students who have difficulty. However, Fred challenged Angela's patience. He was never satisfied with his grade and argued every point. He acted like the world conspired against him and others were to blame for any problems he had. After one exam he waited to see Angela and then went on and on about how unfair the exam was because he couldn't finish it in the time allotted. He said the professor should know better, and besides as an international student for whom English was a second language, he should be given more time than the other students. Furthermore, as a sophomore, Fred seemed to think that the freshmen in the course were at a distinct advantage because their other courses were easier than his. After several such incidents, Angela lost it and in exasperation said, “What on earth do you want me to do? I can't change your grade. Suck it up and work harder!”

Afterward she felt guilty and went to Professor Martin for advice and support, which she got. A few days after the next exam, Fred showed up at the TA office 30 minutes after Angela's office hours and after Angela had gone to a class. He expected her to be there and complained to the other TAs about her absence. One of the other TAs tried to explain that Angela's office hours were over and that she was in class. He could send her an e-mail or come back later. That didn't help. Fred voice rose and he said some offensive things before leaving in a huff.

### **Who's to Blame?**

For the student-designed catalase lab students had to suggest different sources of catalase and design an experimental setup to determine the activity of the enzyme. Carla, the TA, had consulted with each student group about what they planned to do and the experiments went pretty well except for one group. Lauren, Nicole, and Miranda were

upset that their group did not get the expected results. Actually, it was their fault. While extracting the enzyme they spilled their sample. Rather than consult with Carla, they diluted the remaining solution far more than necessary to yield 200 ml of enzyme stock solution. Thus their subsequent dilutions made the enzyme hardly detectable.

Carla was taken aback when she saw their lab report. They claimed that one of the limitations they faced while conducting this experiment was the TA's lack of preparedness in situations when things went wrong!

### **Why Should I Care?**

Sara was a TA who really enjoyed teaching General Biology laboratory in her first semester of graduate school. She worked hard to make sure that the students understood the importance of the lab in addition to understanding the lab purpose and procedures. After two weeks of successful labs, the students became well assimilated in the class, and were comfortable meeting the expectations of the course. Students would read the labs ahead of time, come prepared with their flow sheets, and would follow the procedures well during the lab period, except John. One morning, as Sara was checking everyone's flow sheet, she asked John why he didn't prepare one. John replied, "Well, I never did them last semester, and I still passed. Anyway, I think they are useless." Sara was surprised to hear such a response, so she questioned, "Why do you think they are useless?" John replied, "My other two group members did them, but they don't know what's going on in the lab either, so what's the point?" Sara did not want to be rude to John (she was nervous that he would be offended and complain to Dr. Rhodes), so she asked him to have his flow sheet for the future labs. She talked to Dr. Rhodes about this student, to which he replied, "Don't worry about him too much, he does not pay attention in class either, despite my efforts. You shouldn't waste your time and energy on such students."

### **Wikipedia Dropout**

Jessica, a first-time biology TA, does as she is told. The first assignment she gave was to be turned in the following week. It required a lot of outside research. One student just handed in two pages of quotations from various websites like Wikipedia and cited them.

Jessica was appalled by this and could not believe that a sophomore-level student would think this was acceptable. Especially since at the end of each assignment the student signs a declaration claiming that the work they have submitted is their own work and not plagiarized. Jessica found it ironic, since none of the words on the student's paper were her own. However, they were properly cited.

After consulting with her course instructor, Jessica reached out to the student to see what they struggled with and give him an opportunity to re-do the assignment. After a couple of failed attempts to contact the student, Jessica decided it would be best to give the student a zero for the assignment. The student, having ignored Jessica's emails and seeing that his assignment grade was a zero, dropped the course.

### **Withholding Information**

One day, John got an email from his faculty lab supervisor regarding plagiarism in his class. Zed, a student in John's lab, shared his work with Shen, a student in another class. However, Shen copied the entire format including Zed's name! John's Supervisor asked him to check every student report in his lab and to make sure other students hadn't plagiarized the report. Unfortunately, he found that there was another student, Aly, in his lab who had the identical report. Aly was a smart and careful student who always turned in a great lab report after every experiment. In addition, she usually scheduled an office hour with John to discuss the results of the lab and how it applied to graduate school. John suspected that Aly's report was being shared. Because, he didn't want Aly to get in trouble, he was reluctant to report his discovery to his advisor.

### **Withholding Judgment**

Prof. Greenwood taught the four-credit introductory biology course in which the lab counted for a quarter of the grade. Associated with her lecture section were 11 laboratory sections distributed among six TAs. The TAs took responsibility for grading the laboratories and turned in their lab grades at the end of the semester to be averaged with the lecture grade. The day before the final grades were due, Prof. Greenwood spent calculating grades and trying to make fair adjustments for the differences among lab sections. Generally her TAs turned in grades that easily differentiated among the performance of student in a lab. However, she became exasperated when she came to Allen's grades. He was a fifth-year graduate student trying to write his thesis who had only one section. All of his grades were between 97 and 100.

### **Worn Down**

Before Peichi taught her first lab, she had decided on some rules that she would stick to in lab. Her general idea was students must finish their lab reports. If students have no idea how to get an answer, they have to spend time working on it, then she would be very willing to help them. By the end of the semester, Peichi was answering every question. It was just easier than probing, discussing, and stimulating thinking. She had discovered that approach just took too much time and resulted in not doing the post lab or leaving out some parts of the experiments. At first, she tried to stick to her rules, but the students didn't like it. They complained that it wasn't fair. TAs in other labs answered all of the questions, they said. Peichi felt worn down. She worries students aren't working hard enough to really gain understanding, but she knows her students will complain and thinks they will give her bad teaching evaluations.

### **Write Me a Letter**

Betsy was about to begin her second semester of graduate school. The first semester had gone pretty well despite her chronic lack of sleep. She felt good about her performance as a TA in Organic Chemistry. She had gotten a B<sup>+</sup> or better in all of her courses. And she had been accepted into her first choice of a lab for her graduate research. In January she received the following e-mail message from one of the better students she had in lab.

Subject: Favor

From: Peter Drucker <[peted@myu.edu](mailto:peted@myu.edu)>

Date: Friday, 1/23/06 1:56 AM

To: Elizabeth Barker <[betsybee@myu.edu](mailto:betsybee@myu.edu)>

Hi, this is Pete from your 321 lab last semester. I am applying to do undergraduate research this summer in Dr. Bensons lab. I need letters of recommendation from three people who know me. Can you write me a letter?

Betsy had never written a letter of recommendation and was quite apprehensive about agreeing to write one. She thought, “Why me? What qualifications do I have to write a letter of recommendation? Who would respect anything I would write anyway? I wish Pete would just ask some professor.”

### **Wrong Message**

As the TA of an advanced lab, Kelly’s students were all more advanced than she was. At first, she was apprehensive that the students would not respect her, but after a few weeks all seemed to be going well. One rainy day after lab, Kelly saw Gail, one of her students, waiting for a bus. Since it was raining, Kelly offered Gail a ride.

When Gail got in the car, she started talking about lab reports. She was stressed and overwhelmed, and really did not understand what had happened in lab. This was the last lab report for the class, it was worth a big part of the grade, and Gail was afraid that she would not do well. Kelly tried to clarify what the lab was about, and her understanding of Gail’s heavy workload. Kelly had been instructed to grade the lab reports based on completion rather than content, although she had never told her students this. In a weak moment, while trying to put Gail’s mind at ease, Kelly said, “Gail, do your best. I probably shouldn’t tell you this, but the reports are graded on completion, so as long as you give me a complete report, I will give you full credit.” Gail had always been a good student, and Kelly did not anticipate that Gail would slack off once she knew that the content of the lab reports was not being graded.

The lab report was due by e-mail the week after the lab. Kelly checked her e-mail and saw that Gail had sent her an excel spreadsheet with data that was unlabelled and not completely analyzed. There was no report, just numbers. All of the other students had sent reports that were excellent and it was obvious that they had put in a lot of time and effort. This report was a big part of the course grade, and Kelly needed a fair solution.

### **You Don’t Understand**

Matt was supervising a biology laboratory section and during some of the “down time” Marie, a student, came up to him. She said she is having a lot of trouble understanding the lecture material and needs some help. Matt asked her what problems or concepts she was finding particularly difficult. Marie replied, “I don’t feel like I understand anything! The professor is just awful. When he talks in class, it’s like he’s

speaking in a foreign language. And when people ask him questions or try to get him to clarify things, he just repeats the things he just said and then moves on. I always leave the lecture feeling like it was a waste of my time.”

Matt probed back, asking, “Well, what do you do outside of class? Do you read and study on your own and take advantage of the professor’s office hours to meet with him one on one?” Marie dropped her head and whispered, “You don’t understand.”

### **“You haven’t covered that in lecture?”**

Charles taught three sections of the same organic chemistry lab, but there were two different lecture professors for different sections. In lab one week, students compared SN1 and SN2 reactions. The first two sections went well, so Charles was surprised when the students in the third section were completely confused about the lab. It turned out that their lecture professor hadn’t covered the topic yet, even though the lecture professor had given no indication of his at the weekly TA meeting. Charles tried to help his students by giving a brief prelab lecture on the topic. However, he knew it wasn’t a very well prepared lecture, and the students were quite confused. When grading the labs, Charles noticed that this section performed quite poorly compared to his other sections. He was unsure of how to grade this section, and how to help the students be more positive for future labs.

### **You should get out of the lab**

Jill looked forward to her last lab of the semester. She imagined it with a cozy atmosphere and sad partings of her students who had been together the whole semester. Unfortunately, events prevented the dream. Emmy, didn’t bring goggles to lab before the TA demo began. Based on the instructions of the lab Emmy could not watch the TA demo or do the lab until she managed to get goggles, either taking them from her own dorm or borrowing a pair from others. Jill had no choice to tell Emmy to leave the lab in front of the whole class. Although she had apologized, Emmy was upset. She barked back, “What? Me? In the final lab?!”

Emmy was kind of Jill’s “good friend”, they were friends on Facebook and had some chat in previous labs. Emmy liked to write down some notes on her lab reports such as “Jill I love you”, “Jill is a good friend!” along with a smiley face. Emmy even invited Jill to her parties, although Jill never went. “This is really insulting!” Emmy left the lab room in a huff, making the atmosphere quite awkward. Everyone was just staring at Jill without comment.

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#### Educational Rigor

Caught in the Middle  
Certified Ignorance  
Father Professor  
Free Points for Nothing  
Hard Work is not Enough  
Hold Your Ground!  
Making Points with Point  
No Joke  
Remember Your Units  
Too hard for me!  
Worn Down

#### Formative Assessment

No Joke  
Stone Age Technology

#### Importance of Controls

Lost Control  
Homework Disconnected  
Negative Control  
Weighing Without a Balance

#### Learning

A Sob Story  
Anyone Interested in  
Learning?  
Attached at the Hip

Attention Please  
 Compassionate TA  
 Crushed Dreams  
 Death by PowerPoint  
 Easy Answers  
 Facing the Music  
 Grade Grubber  
 Gregarious Group  
 Hard Work is not Enough  
 He Doesn't Seem to Get It  
 Homeopathy  
 Indecent Exposure  
 International Relations  
 Lecture or Lab?  
 Missing the Point  
 Please Attend Office Hours  
 Plug and Chug  
 Poison Candy  
 Prelabs: To Be or Not to Be?  
 Quantitative Illiteracy  
 Questions, Questions,  
 Questions  
 Slow but Diligent Student  
 Teaching  $\neq$  Learning  
 The Wrong "Right" Answer  
 Too Cool for School  
 Too Much Time on Task  
 What's Unfair?  
 Which Comes First—Lecture or  
 Lab?  
 You Don't Understand  
 You Haven't Covered That in  
 Lecture  
 Urea Challenge  
 Wasted Effort?  
 Which comes First—

#### Teaching Styles

Class Not Taught  
 Death by PowerPoint  
 Free Points for Nothing  
 No Joke  
 Stone Age Technology  
 Teaching  $\neq$  Learning  
 Tequila Tiffany

#### Value of Laboratories

Broken Hope  
 Different Priorities  
 Do We Really Need To Mad  
 Homeopathy  
 Mad Grandma  
 Understand This?

#### Dealing with Students

Academic Dishonesty  
 Answer or Not?

Anyone Interested in  
 Learning?  
 Apathetic TA  
 Bacterial Contamination  
 Bloody Logic  
 Brownie Points  
 Canvas Gone Wrong?  
 Cheat Sheet  
 Cheating: To Report or Not?  
 Confront or Not?  
 Consulting a Higher Authority  
 Copy Cat  
 Crocodile Tears  
 Cyber Impact  
 Disappointed TA  
 Embarrassing Moment  
 Failing is Enough  
 Ghost Student  
 IF\*AT Cheating?  
 Inside Information  
 It's Our Data and Our Graph  
 Missing Data  
 Missing Grades  
 Overruled  
 To be Good is Not Always  
 Good!  
 Lab Report from an Unfinished  
 Lab  
 Magical Mystery Lab  
 Negative Control  
 No Second Chance  
 Now I can Understand You  
 Physical Chemistry?  
 Pop Quiz  
 Roommate Dilemma  
 Secret in the Drawer  
 Seeing Double  
 Share and Share Alike  
 Smart Plagiarism  
 "Steady Hands"  
 Substitute TA  
 Tough Situation  
 Wandering Eye Weighing  
 Where is Your Homework?  
 Wikipedia Dropout  
 Withholding Information  
 Without a Balance

#### Attitudes

A Stupid Graph  
 Anyone Interested in Learning?  
 Bench Sitter  
 Different Priorities  
 Dormez Vous?  
 Do We Really Need To?  
 Finger Pointing  
 Inside Information

- Lab Prep  
 Only Grades Count  
 Others Know More Than Me  
 Sleeping Beauty  
 The Lecture  
 Too Close to an F  
 Understand This?  
 Wanted, A Friendly TA  
 Why Should I Care?
- Communication**  
 But you said...  
 Caught between a Rock..  
 Dead Silence  
 Failure to Communicate  
 Lab Prep Mix up  
 Locked Out  
 Disparate Lab Courses  
 Job in Jeopardy  
 Rules to be Broken
- Disparate Abilities**  
 Apathetic and Antisocial  
 Dealing with Uncertainty  
 Feelings of Guilt  
 Good Students?  
 Homework Disconnected  
 Monday ...No Fun Day  
 Quantitative Illiteracy  
 Smart but Stupid  
 Weak Student  
 Uneven Divide  
 Three Peas in a Pod  
 Too hard for me!
- Disruptive Behavior**  
 After Lab Angst  
 Angry Response  
 Apathetic and Antisocial  
 A Specious Argument  
 Down Time  
 Can we move on?  
 Finger Pointing  
 Gloves on Feet  
 Go Get Your Goggles  
 Goggle Goof-off  
 Good Students?  
 Goof Off Justice  
 Gregarious Group  
 Helper  
 Jack Daniels  
 Leaping Lizard  
 Loose-leaf Efforts  
 Mad Grandma  
 Offensively Obnoxious Student  
 Only Grades Count
- Preempted Prelab  
 Seeing Red  
 Sharing Responsibility  
 Smart but Stupid  
 Snide Comments  
 Speechless  
 The Nontraditional Student  
 Too Cool for School Tough  
 Situation  
 Troublesome Trio  
 Water Sports  
 Whining Too Much
- Diversity**  
 Oil and Water
- Fairness**  
 Attached at the Hip  
 Brilliant Trouble  
 Deadlines  
 Disney Favorites  
 Excused or Not Excused?  
 Facing the Music  
 Full Credit for Showing Up  
 Hard Grader?  
 Marching to Different Drummers  
 More Time  
 Only This Time  
 Pop Quiz  
 Redox Problems  
 Slacker  
 The Wrong "Right" Answer  
 Time's Up  
 Weeding Out?  
 What's Unfair?  
 Worn Down
- Gender Issues**  
 Can I get your number?  
 Dear Abby  
 Friendly Invitation  
 Good Students?  
 Nice Goggles  
 Post-Office Hours?  
 Student Invitation
- Lab Partners**  
 Apathetic and Antisocial  
 Bathroom Break  
 Bench Sitter  
 Deadbeat Lab Partner  
 Good Students?  
 Gregarious Group  
 Group Effort  
 I CAN'T WORK WITH YOU!!!  
 Jabber Jaws  
 Lazy lab Partners  
 Missing Data  
 Oil and Water

- Slacker
- Sleeping Beauty
- Smart but Stupid
- Stinky
- Three Peas in a Pod
- Time to go Home
- Tissue Time
- Troublesome Trio
- Uneven Divide
- Weak Student
- Learning Disabilities
  - Are Introverted Students at a Disadvantage?
  - Caught between a Rock..
  - He Doesn't Seem to Get It
  - One Spill Too Many
  - Others Know More Than Me
  - Plug and Chug
  - Quantitative Illiteracy
  - Speechless
  - Special Needs
  - Time Confusion
- Math Anxiety
  - Crying Student
  - Dilution Delusion
  - Plug and Chug
  - Quantitative Illiteracy
  - Tears of Despair
- Motivation
  - Chemistry
  - Deadbeat Lab Partner
  - Dealing with Disorganization
  - Death by PowerPoint
  - Different Priorities
  - Dormez vous?
  - Down Time
  - Ghost Student
  - Goof Off Justice
  - Grade Grubber
  - Grades are Not Important
  - Grateful Student
  - Lights Out
  - Monday ...No Fun Day
  - Notebook Woes
  - Please Attend Office Hours
  - Repeat Performance
  - Smart but Stupid
  - Sweet and Sticky
  - Too Close to an F
  - Wrong Message
- Performance
  - Attention Please
  - Baby Sitting Bryan
  - Credit for Missing Data
  - Expectations Dashed
- Making Points with Points
- Notebook Woes
- Intelligent, But Lazy?
- Time to go Home
- Wrong Message
- Preparation
  - Attention Please
  - Four Minus Two Equals What?
  - Grateful Student
  - He Doesn't Seem to Get It
  - Hold our Ground!
  - Inefficiency vs Impatience
  - Lab Prep
  - Pop Quiz Distress
  - Read the Book
  - The Lecture
  - Thick Skin
  - What are we doing in Lab today?
- Physical Handicaps
  - The Nontraditional Student
  - To be Good is Not Always Good!
- Illness
  - Bathroom Break
  - Headache?
  - In Class Illness
  - Make-up Mess
  - Responsible Student
  - Sleeping Beauty
  - Sick Student
  - TA or Friend?
  - The Lecture
- Student Conflict
  - A Specious Argument
  - Angry Response
  - Cyber Impact
  - Delayed Response
  - Group Effort
  - I CAN'T WORK WITH YOU!!!
  - Offensively Obnoxious Student
  - Pair Repulsion
  - Pop Quiz Distress
  - Semper fidelis*
  - The Nontraditional Student
  - Time Delay
  - Too Cool for School
  - Uneven Divide
- Unexpected Behavior/Situation
  - Are You Making This Up?
  - Candy TA
  - Case of Hysterics
  - Contact Discomfort Excused or
  - Crying Student

Dressing for the Occasion  
 Faint of Heart  
 Goof Off Justice  
 In Class Illness  
 Kate's At Eight  
 Life and Death Situation  
 Lights Out  
 Managing the Lab  
 Missing Grades  
 Missing Student  
 Not Excused?  
 Passive Aggressive  
 Physical Chemistry?  
 Professorial Confusion  
 Seeing Red  
 "Spirited" Group  
 Stinky  
 Sweet and Sticky  
 The Nontraditional Student  
 Water Sports  
 What Just Happened?  
 You Should Get Out of the Lab

### Dealing with Being a Teaching

#### Assistant

##### Attitudes

Baseball Fan  
 Only This Time  
 Positive Feedback  
 Read the Book

##### Ethics

Butterfingers  
 Disappointed TA  
 Free Tutor?  
 Getting Better Each Time  
 Grader Aid  
 Inappropriate Relationship  
 Let it be?  
 Only This Time  
 Tricky Thanks

##### Evaluation by Faculty

Dilution Delusion  
 Excellence in Teaching Awards  
 Hearing Hearsay  
 Spreading the Word

##### Interacting with Faculty

But the TA Doesn't Like Me  
 Caught in the Middle  
 Cheating: To Report or Not?  
 Deadlines  
 Disparate Lab Courses  
 Doctor's Note  
 Dry Lab  
 Excellence in Teaching Awards  
 Failure to communicate  
 Father Professor

First Class Confusion  
 First Impression,  
 Following the Schedule  
 Free Points for Nothing  
 Grade Deflation  
 Guest House  
 Hurricane Damage  
 I'm Not Superman  
 Instructions Please  
 Job in Jeopardy  
 Late Night Study Session  
 Let it be?  
 Luck of the Draw  
 Managing the Lab  
 Marching to Different Drummers  
 Misunderstanding?  
 More Time  
 New Course Design  
 No More Unknowns  
 No Second Chance  
 Nobel Prize for Patience  
 Now I can Understand You  
 Order in the Lab  
 Overruled  
 Passing the Buck  
 Prelabs: To Be or Not to Be?  
 Professor MIA  
 Professorial Confusion  
 Redox Problems  
 Relaxed or Not?  
 Repeat Performance  
 Rules to be Broken?  
 Slow Professor  
*Semper fidelis*  
 Spreading the Word  
 Strong Acid  
 Substitute TA  
 Supervisor Missing in Action  
 Tattle Tale?  
 Terrorizing TA  
 Thanks, But No Thanks  
 The Early Bird Gets  
     the...Grading  
 Too Much Time on Task  
 Tough Grader  
 Traffic Troubles  
 Twitter Talk  
 "Unfair Exam"  
 Weeding Out?  
 Which Comes First—Lecture or  
     Lab?  
 Withholding Information  
 Withholding Judgment  
 Why Should I Care?  
 You Don't Understand  
 Unlimited Quiz Attempts

## Interacting with Students

Bad Day  
 Baseball Fan  
 Being Cool  
 Brownie Points  
 But the TA Doesn't Like Me  
 Can we move on?  
 Candy TA  
 Class Conflict  
 Crushed Dreams  
 Dead Silence  
 Easy Answers  
 Expectations Dashed  
 Fraternalized Student  
 Friendly Invitation  
 Good Chemistry?  
 Good Night  
 Grateful Student  
 Grieving  
 Hellper  
 Homeopathy  
 International Relations  
 Jack Daniels  
 Kate's at Eight  
 Lab Report from an Unfinished  
   Lab  
 Late Night  
 Let it be?  
 Lost in Translation  
 Made for TV Drama  
 Magical Mystery Lab  
 Only Grades Count  
 Paid Tutoring  
 Poison Candy  
 Spring Semester Blues  
 Sweet and Sticky  
 Terrible Time Tutoring  
 Terrorizing TA  
 Tissue Time  
 Too hard for me!  
 Transfer Student  
 Tricky Thanks  
 Twitter Talk  
 Wanted, A Friendly TA  
 When Parker took the Marker  
 Wrong Message

## Interacting with other Teaching

Assistants  
 Answer or Not?  
 Apathetic TA  
 Clean Lab  
 Early Dismissal  
 Excellence In Teaching Awards  
 Full Credit for Showing Up  
 Grade Deflation

Getting Rid of the Haze  
 Lab before Exam  
 Lab Prep Mix up  
 Know-it-all Missing Key  
 Only This Time Parasitic TA  
 Professor MIA  
 Running Late  
 Seeing Double  
 Substitute TA 1  
 Substitute TA 2  
 TA Envy  
 TA Friction  
 Taking It Easy  
 Tattle Tale?  
 Terrorizing TA  
 Too Much Time on Task  
 Twitter Talk  
 Spreading the Word  
 Which Comes First—Lecture or  
   Lab?

## International Teaching Assistants

A Lovely TA  
 A Sob Story  
 Attention Deficit  
 Cultural Differences  
 Dormez-vous  
 Down Time  
 Facing the Music  
 First Impressions Four Minus  
 Two Equals What?  
 International Relations  
 Job in Jeopardy  
 Just a Friend?  
 Keys to Friendship  
 Kicking the Habit  
 Leaping Lizard  
 Lost in Translation  
 Lost to Lab Pass  
 Misunderstanding?  
 Preempted Prelab  
 Nine-One-One  
 No Joke  
 Oil and Water  
 Pair Repulsion  
 Roommate Dilemma  
 Sick Student  
 Smart Plagiarism  
 Stone Age Technology  
 Time Confusion  
 To be Good is Not Always  
   Good!  
 Too Cool for School  
 Translating MSDS  
 Troublesome Trio  
 Worn Down Broken Hope  
 When Parker took the Marker

**Making Independent Decisions**

Are You Making This Up?

Case of Hysterics

Cheat Sheet

Coming Up Short

Confront or Not?

Failing is Enough

Free Tutor?

Hurricane Damage

Indecent Exposure

Lab before Exam

Life and Death Situation

Intelligent, But Lazy?

Last Minute Decision

Lost Backpack

Make-up Mess

More Time

No Second Chance

Right Answer, Wrong

Reason

Supervisor Missing in Action

Unlimited Quiz Attempts

Urea Challenge

Wandering Eyes

Wasting Lab Time?

**Mental Health**

Chemistry

The Last Straw

Whining Too Much

**Preparation**

Assigning Blame

Bad Day

Broken Computer

Certified Ignorance

Dependent Student

Getting Better Each Time

Hold Your Ground!

Lab Prep Mix up

Luck of the Draw

Impatient Students

Making Labs Work

Never Ending Experiment

Poison Candy

Preempted Prelab Relaxed or

Not?

Student Self Instruction

TA Train Wreck

Water Everywhere

Who's to Blame?

**Responsibilities**

Beyond the Call of Duty

Changing Directions

Cutting Corners Makes Sharp

Edges

Dry Lab

Early Dismissal

Feelings of Guilt

Full Credit for Showing Up

Late Night Study Session

Life and Death Situation

Luck of the Draw

Missing Key

Missing Student

Missing the Grade

No Goggles, No Lab

Paid Tutoring

Positive Feedback

Special Needs

"Spirited" Group

Spring Semester Blues

Supervisor Missing in Action

The Early Bird Gets

the...Grading

Troubles Compounded

Twitter Talk

What are we doing in Lab

today?

Where Have You Been?

Write Me a Letter

You Should Get Out of the Lab

**TA Mistakes**

An Alarming Tale

Butterfingers

First Impressions

Missing the Grade

Time Confusion

**Technology**

Canvas Gone Wrong?

IF\*AT Cheating?

**Time Management**

After Hours

Better Late than Never?

Beyond the Call of Duty

Can we move on?

Compassionate TA

Dependent Student

Fraternalized Student

Free Tutor?

I'm Not Superman

Inefficiency vs Impatience

Lost Control

Mean Grader

Nobel Prize for Patience

Parasitic TA

Slow Professor

The Last Straw

Too Much Time on Task

**Dealing with Laboratory****Management**

Absenteeism

A Cause for Concern  
 AWOL  
 Bathroom Break  
 Caller ID  
 Crocodile Tears  
 Cultural Differences  
 Doctor's Note  
 Dormez-vous  
 Excused Absences  
 Ghost Student  
 Headache?  
 Lost to Lab Pass  
 Missing Student  
 Now I can Understand You  
 Repeat Performance  
 Sending a Message  
 Sick Student  
 The Shirker  
 Time Delay  
 Weathering the Storm

Clean-up

- Clean Lab
- Cutting Corners Makes Sharp Edges
- Getting Rid of the Haze
- Novel Solution
- Time to go Home

Discipline

- Attention Deficit
- Every Point Counts
- Jack Daniels
- Mad Grandma
- No Goggles, No Lab
- Pop Quiz
- Seeing Red
- Semper fidelis*
- Tough Situation

Distractions

- Baseball Fan
- Triple Axel vs. Gen Chemistry

Following Directions

- Baby Sitting Bryan
- Changing Directions
- Clear Solutions Turn Pink
- Dependent Student
- Delayed Response
- Do We Really Need To Understand This?
- Dry Lab
- Early Dismissal
- Following the Schedule
- Jabber Jaws
- Lab Prep
- Marching to Different Drummers
- Missing the Point

- Passive Aggressive
- Poisoning the Well
- Thick Skin
- Three Peas in a Pod
- Too Little, Too Late
- Who's to Blame?

Grading

- A Stupid Graph
- Angry Response
- Are Introverted Students at a Disadvantage?
- AWOL
- Brilliant Trouble
- But you said...
- But we did the work...
- Caught between a Rock...
- Certified Ignorance
- Consulting a Higher Authority
- Credit for Missing Data
- Deadlines
- Dilution Delusion
- Disney Favorites
- Doctor's Note
- Drop the Missing Assignment
- Every Point Counts
- Excused or Not Excused?
- Extra Credit
- Facing the Music
- Failing is Enough
- Free Points for Nothing
- Full Credit for Showing Up
- Good Chemistry?
- Grade Deflation
- Grade Grubber
- Grader Aid
- Grades are not Important
- Group Effort
- Hard Grader?
- I CAN'T WORK WITH YOU!!!
- Incorrect Source
- Instructions Please
- Is More Credit Due?
- It's Our Data and Our Graph
- Loose-leaf Effort
- Making Points with Points
- Managing the Lab
- Mean Grader
- Monday ...No Fun Day
- Notebook Woes
- Novel Solution
- Now I can Understand You
- Physical Chemistry?
- Pop Quiz Distress
- Redox Problems
- Remember Your Units
- Responsible Student

Right Answer, Wrong Reason  
 Seeing Double  
 "Steady Hand"  
 Taking It Easy  
 Tattle Tale?  
 Time Delay  
 Timed Out  
 Time's Up  
 The Boss's Daughter  
 The Wrong "Right" Answer  
 Too Little, Too Late  
 Tough Grader  
 Twitter Talk  
 "Unfair Exam"  
 Unlimited Quiz Attempts  
 What's in a Grade?  
 Withholding Judgment  
 Where is Your Assignment?  
 Whining Too Much  
 Wikipedia Dropout  
 Wrong Message  
 You Haven't Covered That in Lecture  
**Laboratory Partners/ Group**  
 After Hours  
 Apathetic and Antisocial  
 Bench Sitter  
 Brilliant Trouble  
 Deadbeat Lab Partner  
 Group Effort  
 Inefficiency vs Impatience  
 Jabber Jaws  
 Lazy Lab Partners  
 Lost Backpack  
 Missing the Point  
 Pair Repulsion  
 Sharing Responsibility  
 "Spirited" Group  
 Too Little, Too Late  
 Stinky  
**Laboratories that Don't Work**  
 Experimenting with Frustration  
**Make-up Laboratories**  
 An Alarming Tale  
 Are You Making This Up?  
 Broken Hope  
 Cultural Differences  
 Excused Absences  
 Goof Off Justice  
 House Guest  
 Late Again?  
 License Expired  
 Lights Out  
 One Spill Too Many  
 Make-up Mess  
 Only This Time  
 Sick Student  
 TA or Friend?  
 Taking It Easy  
 The Shirker  
**Providing/Sharing Data**  
 Answer or Not?  
 But we did the work  
 Cyber Impact  
 Homeopathy  
 Lost Backpack  
 Lost Control  
 Making Labs Work  
 Missing Data  
 Negative Control  
 Share and Share Alike  
 "Steady Hands"  
 TA Alchemist  
 Tears of Despair  
 The Wrong "Right" Answer  
**Punishment**  
 Goof Off Justice  
 Bloody Logic  
*Semper fidelis*  
 Sending a Message  
**Student Preparation**  
 Wasting Time or Not?  
**Tardiness**  
 Bloody Logic  
 Caller ID  
 Ghost Student  
 Late Again?  
*Semper fidelis*  
 Triple Axel vs. Gen. Chemistry  
**Time Management**  
 Beyond the Call of Duty  
 Early Dismissal  
 Extra Credit  
 Father Professor  
 Hearing Hearsay  
 Late Night  
 Passing the Buck  
 Questions, Questions, Questions  
 Running Late  
 Slow but Diligent Student  
 Timed Out  
 Wasting Time or Not?  
 Where Have You Been?  
**Trouble-shooting**  
 Assigning Blame  
 Experimenting with Frustration  
 First Class Confusion  
 Impatient Students

Last Minute Decision  
 License Expired  
 Mystery of the Missing Base  
 Problem with a Solution  
 Problems Compounded  
 Relaxed or Not?  
 TA Alchemist  
 Water Everywhere  
 What's Wrong with this Lab?  
**Unexpected Problems/Situations**  
 Are You Making This Up?  
 Case of Hysterics  
 Caught between a Rock  
 Cell Phone – Turn Off?  
 Hurricane Damage  
 License Expired  
 Never Ending Experiment  
 New Course Design  
 Passed Out  
 Poisoning the Well  
 Power Failure  
 Problem with a Solution  
 TA Train Wreck  
 Traffic Troubles

### **Dealing with Extra-Laboratory**

#### **Issues**

#### **Outside Assistance**

Friendly Invitation  
 After Hours  
 Paid Tutoring  
 TA Envy  
 Terrible Time Tutoring  
 Wrong Message

#### **Personal Relationships**

Can I get your number?  
 Coffee Shop Blues  
 Contact Discomfort  
 Dear Abby  
 Good Chemistry?  
 Good Night  
 Inappropriate Relationship  
 Just a Friend?  
 Kate's at Eight  
 Keys to Friendship  
 Made for TV Drama  
 Nice Goggles  
 Post-Office Hours?  
 Student Invitation  
 TA Friction

TA or Friend?  
 Tequila Tiffany  
 The Last Straw

#### **Lost and Found**

Locked Out  
**Mentoring**  
 Chemistry  
 Fraternalized Student  
 Transfer Student  
 Write Me a Letter  
**Help Sessions and Proctoring**  
 A Cause for Concern  
 Embarrassing Moment  
 Expectations Dashed  
 Grader Aid  
 Hard Work is Not Enough  
 Hearing Hearsay  
 In Class Illness  
 Know-It-All  
 More Time  
 Post-Office Hours?  
 Passed Out  
 Speechless  
 Thanks, But No Thanks  
**Faculty Research Supervisors**  
 Substitute TA  
 The Boss's Daughter  
 Where Have You Been?

### **Content Issues**

Acid Base Titration  
 Clear Solutions Turn Pink  
**Biological Nomenclature**  
 A Specious Argument  
**Enzymes**  
 Homework Disconnected  
**Grignard Reaction**  
 Experimenting with Frustration  
**Metal Cations**  
 Flame Test  
**Microbiology**  
 Bacterial Contamination  
**Microscopes**  
 Butterfingers  
 What Just Happened?  
**Nature of Science**  
 Dealing with Uncertainty  
**Quantitative Analysis**  
 Wasting Lab Time?  
**Respiration**  
 Leaping Lizard  
**Scientific Units**  
 Remember Your Units  
**Serial Dilutions**  
 Dilution Delusions  
**SN1 and SN2 Reactions**

You Haven't Covered That in  
Lecture

Statistics

“Steady Hands”

t-Test

Snide Comments