For the past 15 years or so, I have had a number of undergraduate students working to help me and the department with organizing and implementing the equipment setups for our introductory physics laboratories. For the most part, we have had capable, motivated and dependable students providing this very valuable service to the department. I have had some outstanding assistants, but in some cases, I have not always gotten the performance from the assistants that I would have preferred. Although I have always thought that I have communicated sufficiently my expectations, the results would indicate otherwise. Therefore, this document is my attempt to make my expectations as clear as possible.

First let me explain my perception of what we are trying to accomplish. I maintain that the university is a business. The university offers knowledge and services for sale. Students purchase this knowledge and services by paying money. We provide them a receipt in the form of a degree certifying that they have received this knowledge and service, i.e., a college education certified with a diploma. As with all consumers, students (and parents) expect to receive a quality product (education) for their money. In the case of laboratories, students should expect to have: (1) up-to-date equipment, (2) functional equipment, (3) a clean and organized laboratory, (4) equipment that is set up properly and on time with all the necessary components, and (5) a lot of other things pertaining to the quality of instruction they receive and that is not the issue of expectations for persons assisting with the laboratory setup of equipment.

There are many ways to provide the laboratory experience for students. For the bulk of our labs, we are using traditional methods designed primarily to work efficiently with large numbers of students in a controlled, guided process. Our labs are meant to be analytic, quantitative, rigorous, and challenging. They require attention to detail, preparation, and careful execution with thoughtful analysis and presentation of results. Learning and practicing proper experimental techniques to achieve satisfactory results is a primary objective of the laboratory experience. Careful attention to detail is what makes the construction of one automobile better than another and what makes the practice of medicine acceptable in one case and completely unacceptable if attention to detail is lacking.
Often I am asked to write letters of recommendation for students who have worked for me. The following is a list of things that employers are interested in and I try to write about if possible and applicable:

- Dependability/Reliability
- Ability to Work Independently
- Integrity/Trustworthiness
- Judgment/Self Confidence
- Personality and Leadership
- Motivation and Initiative
- Conscientiousness/Attention to Details
- Knowledge and Intellectual Ability
- Innovativeness/Resourcefulness
- Interpersonal Relations/Empathy and Sensitivity
- Maturity and Emotional Stability
- Creativity and Originality
- Intellectual Curiosity and Potential
- Skills
  - Mechanical
  - Experimental
  - Theoretical
  - Programming
  - Use of Apparatus
  - Writing/Communication

Of these, (1) Dependability/Reliability, (2) Conscientiousness/Attention to Details (3) Ability to Work Independently, (4) Integrity/Trustworthiness, (5) Judgment/Self Confidence, (6) Personality and Leadership, and (7) Motivation and Initiative are the positive traits that I expect our laboratory assistants to exhibit. I’ll address these one by one.

Dependability/Reliability: To me and many others, dependability is most important. Our labs are tightly scheduled, leaving little time for setup during normal working hours. Labs are mostly set up first thing in the morning and assistants are required to be here at those appointed times. Often, labs require a full, two hour setup time with at least two persons doing the work. If one of those persons fails to show up or is late, the other workers have to cover the deficit. This is not always possible and is unfair to the others. Lab setup is simple and does not require great skills. However, it does require dependability and reliability, and this is my number one expectation.

Ability to Work Independently: I’ve said many times, if I have to work with the assistant minute by minute, I’m better off doing the work by myself. However, I need the assistance. It takes more than one person to set up the labs and to do the requisite work in the manner I expect it to be done.
Conscientiousness/Attention to Details: Next to dependability and reliability, the most important thing in setting up labs is conscientiousness and attention to detail. I’m sure if one knows his or her physics well, that would be helpful. However, setting up labs is simple and mostly physical, but easy, labor. Persons without much knowledge of physics can do it with just a little instruction and these two important traits. Attention to details insures equipment is set up properly. It means that the lab is kept neat and clean. It means equipment is stored properly in its assigned space. It means that equipment is repaired when needed and loose equipment items found in the lab are recognized and reunited with the apparatus they belong to. It means that you are conscientious about having the best job performance possible, and making sure that the lab operation is the best it can be.

Integrity/Trustworthiness: This is a trait that I assume exists in all physics people, and I don’t worry much about it until I’m proven wrong about a person. However, I do need to point out that the work I’m describing is a position of responsibility with occasional access to information that may be private and protected by federal and state laws. The position can also include access to information that, if unprotected, can jeopardize the academic integrity of the laboratory. The laboratory has hundreds of thousands of dollars in equipment that needs to safeguarded. The laboratory setup operation cannot function without an atmosphere of trust.

Judgment/Self Confidence: Not often, but occasionally, an assistant needs to make some decision on his own about the setup and operation that he is assisting. I would hope that person makes wise decisions with some level of confidence. If you don’t know what is right or wrong, it is best to ask and not take anything for granted.

Personality and Leadership: When working together as a group, everyone needs to act more like a leader. They need to act as a leader in the sense that each person takes responsibility for making sure that things are done right. You can’t assume that because one assistant does the work one way that it is the right way. Each assistant should survey the lab setup to see if it is complete. Too often short cuts are taken that are handed down year after year until nothing is being done according to the way that is needed. Leaders can lead the way of bad habits or the way of good habits. Personalities can enter into the mix and can lead others astray from following good habits. Don’t be led by false leaders.

Motivation and Initiative: Motivation and initiative are important attributes. It is hard to be motivated to crawl out of bed and be on the job promptly at 8:00 in the morning. However, that is what this job often requires. Payment for services can be one motivation, but it is probably not the best. We normally pay more than minimum wage, whereas a lot of jobs at the university or out in the private sector only pay the minimum. The best motivation comes from the pride one takes in having the discipline to do a job with one’s best ability. It also comes from the pride one takes in contributing to the success of our program. Initiative is a very important trait that is expected of our assistants. It involves assessing the needs at hand and taking the initiative to meet these needs without prompting or supervision.
Specifics:

1. Make sure the labs are locked when left unattended.

2. The lab benches become soiled throughout the week of use and should be cleaned with water and cleanser at least once a week.

3. When taking down experiments and putting up equipment, make sure the equipment is placed in its proper storage container and returned to its assigned space.

4. Police the lab after taking down experiments to look for lost pieces of apparatus and extraneous loose and sometimes unidentifiable items associated with the equipment.

5. Sets of numbered and ordered apparatus such as lens sets should be re-ordered. This is done to insure that students have full sets of equipment without missing items. This should be done immediately when returning the equipment to storage, as it alerts us to missing items at the earliest time so that we have a chance of finding the missing item.

6. Pick up and dispose of loose pieces of paper and trash left on the benches and in the storage compartment beneath the benches.

7. Report all needed repairs and missing equipment to me, and/or place the broken equipment where I can deal with it later with a note regarding the problem. Electronic problems can be taken directly to the electronics shop for repairs.

8. Our policy is to set up the apparatus in a neat, orderly fashion ready to be used. This means wired and assembled for use.

This list cannot be all inclusive, but is meant to provide a few specific examples of my expectations. The rest can be added by any good conscientious student willing to help make the laboratory experience a success.
List of Responsibilities of people setting up labs in 508 and 510
By Jason Therrien, Undergraduate Assistant Fall, 2004 to Spring, 2007

1) Always meet with Dr. Parks to make sure that the labs are set up properly. Even if you set up the labs the night before, come in at 8 to meet with Dr. Parks to make sure that everything is right.

2) Each piece of equipment has a designated place; please return it to that place. If you find something out of place please correct it.

3) Always make sure that all lab benches are clean before setting up next week’s lab. If students have left garbage at the stations please throw it away. The labs are a reflection of the department; please help to keep everything as nice as possible.

4) Several pieces of equipment rely on batteries; please make sure that not only the pieces are turned off before putting them away, but also test each piece while setting it up and make sure they are in proper working order. Batteries can be acquired from the Electronics Shop in room 203, tell them that they are for the fifth floor labs.

5) Many labs use the Pasco Power supplies. These supplies come in two varieties, low voltage and high voltage. Make sure that you have supplied the proper power supply for the experiment.

6) A few of the labs require water to be used. Either towel dry each piece or drain the water from them and leave them on the counter that has the sink for no more than 1 week. For the resistance versus temperature lab the students use a water bath; fill each piece of equipment with water when you set them up so that students do not damage the equipment unwittingly.

7) Always clean up any water spills; do not just assume that it will evaporate before any students arrive.

8) Always lock the doors and turn off the lights when you leave.

9) A few experiments involve hanging masses. Invariably the masses become disorganized and sets are mixed up between stations. Please take the time to organize them before putting them back. It doesn’t have to be perfect, but do not just throw masses in the tray.

10) Make sure that if students need information about the equipment that is not specified in the lab manual that it is written on the board. One example that comes to mind is in one lab the students need to know what the mass per unit length of the string in the lab is. Since this string could vary from year to year depending on availability it is not provided in the lab manual. Normally you can find this information in a conspicuous location, in this case the spool from which you would cut new string.

11) For the optical instrument and simple lenses labs make sure that the students have complete sets of lenses. As with the masses, lenses tend to be shuffled around during the
course of a lab (I still don’t know why) and they need to be reorganized every time. Each
lens belongs to a specific set and is marked accordingly. If for some reason one is
missing, please inform Dr. Parks immediately.

12) Make sure all the lasers are working properly while setting up each lab; if one isn’t, tell
Dr. Parks.

13) A few of the labs require light bulbs; replacements can be acquired from the Electronics
Shop in Room 203.

14) If you notice that there is a computer problem, please report it to the Electronics Shop in
room 203.

15) If for some reason you are not able to set up a lab contact Dr. Parks immediately.

16) Several pieces of equipment have cords (Oscilloscopes, photogates, etc.). Make sure that
you put them away in a very organized manner so that the cords do not become tangled. I
prefer to use rubber bands to tie the cords off with, but regardless of how you do it, this
will only make things easier on you and will make things more organized.

17) As the semester nears its end, a week or two before the make-up labs are supposed to take
place, send an e-mail to all the GTA’s asking if they need any labs set up and when.
There are two reasons for this. First, the GTA’s do not know where things are kept nor
where they go when they are done with them (though one would assume they can put
things back where they found them, don’t count on it) and as such will leave the labs
turned upside down. Also, by telling the GTA’s early that you are the person they should
go to you will minimize the number of last-minute requests for set ups. Do not count on
Dr. Parks to remind you; he is busy and has far more important things to worry
about. Take some initiative.

18) Before you leave campus for winter break or summer break, pick up the labs thoroughly.
This includes putting all the apparatuses away, cleaning off the front row of benches that
normally collect excess equipment and recycling any paper, cleaning off not only the tops
of the lab benches but the inside of them as well. Also make sure that the stock room
hasn’t fallen into disarray and everything is where it should be.

19) For the Half-Life of Barium 137 lab, make sure that sample holders are washed in warm,
soapy water.