In teaching the 231 labs I have found that students usually find the lab Manuel a bit confusing in some sections. So this year, I am trying to improve the labs by doing a setup in front of the class to give you an idea of what you will be doing. I will set up a mini-trial run experiment in front to let you see how the apparatus is to be used.

(1). The Final Project (attention all Engineers…News Flash..)

I will also change my final exam grading in these labs. My students last year tell me that my final exam was really complicated. I guess Quantum Mechanics was a bit complex for the introductory lab anyway. This year you all will get to design a project for the lab grade (50% of you lab grade will come from this project). You can pick from the list that I have make below or if you have a better idea, come see me first before you start drawing and making a working theory on the project.

1. The shock-wave cannon.
2. The Exploding wire project, you really need to talk to me if you try to do this one, we will have to design a safe system!
3. Paper Air Plane project.
4. The Hot Air Engine, that works off electricity and Air.
5. Mini-Prototype rocket. (Please no I.C.B.M.’s)
6. A Methanol Burning engine, future energy source.

Some other useful hints that you might find interesting are:

The exploding wire project:
http://users.tm.net/lapointe/Wire_Explosions.html

The Shock Wave cannon project:
http://www.srl.org/machines/shockwave/

Alternative fuels for engines:
Figure 01: Here is a good example of an experiment that deals with the exploding wire that will cover one of our labs, resistive heating of the wire is absorbed into the calorimeter and hence we can measure the amount of the energy released in an estimated time frame. See *Vacuum Calorimetry in Exploding Wire Studies*, by Mario Rabinowitz

You can work in groups of four, I need to know in advance what project that you will be working on so I can get an idea that everyone is working on something. I do have a break-down of the final project as follows:

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<tr>
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<th>Final Project Grading Break Down:</th>
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<tbody>
<tr>
<td>1.</td>
<td>(15%) Project grade will be from the Mathematics, proofs, and equations in the working theory of the project.</td>
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<tr>
<td>2.</td>
<td>(10%) Project grade will be from graphs of the data. Can be graphs of the equations used in the theory, like pressure versus volume, or actual data recorded from the first trial experiment of the project.</td>
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<tr>
<td>3.</td>
<td>(20%) Project grade will be on how the experiment will actually run. I would say an explanation in detail how it works.</td>
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<tr>
<td>4.</td>
<td>(10%) Project grade will be from something in experiment over what we did in the lab. You will have to have at least one topic from our labs in your project!</td>
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<td>5.</td>
<td>(20%) Project grade will come from the experimental trails you accomplished before the final date. I recommend that you do a trial run around the First of November if possible.</td>
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<tr>
<td>6.</td>
<td>(10%) Project grade will come from keeping a log book of everything that was done, who done it, what theories were made and on what day, who made the theories, and when did you do the first test. What was the outcome of the first test? What modifications did you have to do? Why did you do these modifications? What went wrong on the first experiment?</td>
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<tr>
<td>7.</td>
<td>(15%) Project grade will come from the final Project Presentation in class to be given on lab during the last week of class. We will vote on this day!</td>
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(II). Your total grade break down will be as follows:

1. **(20%)** Total lab grade will come from the In-Class participation grade! When you finish your lab I will sign it. If you will need to miss a lab for any reason, please let me know and we will reschedule a lab latter in the semester. If you miss more than three labs and you haven’t let me know, then I’ll assume that you have withdrawn from the lab!

2. **(40%)** Total lab grade will come from homework and reports.

3. **(40%)** Total lab grade will come from the final project.

100% Total Lab grade accounted for.

(III). Lab Rules that will be enforced:

1. **No eating or drinking in the labs.** I do not want to see a can or cup of any kind in the room! If I see you with a cup in the lab you are to put it away, it doesn’t belong in the lab!

2. Do not leave any containers with a liquid in it, pour out all liquids or mark the container as to what type of liquid is in the container!

3. You are to treat each other with respect. **No foul language is to be used in the lab!**

4. Treat the apparatus as if it was your own! If you get frustrated with the experiment because it doesn’t work correctly then try looking back through your steps to see what is wrong or get me and we will work through it. Besides, I’m not grading you on how fast you can get your experiment done, but on the quality of work! I have, myself, had many experiments that I had to walk away from and then go back a redo because I realized what I was missing!

5. My main goal, to have fun studying physics and to stay alive! I’ll be giving you hints in class on how to stay alive; you will thank me one day for sure!!!

Don’t forget that we need to build safe projects, if possible build your safety into your projects. I may ask you some questions about safety once you decide to build! Always respect what you build!