Mastering Physics 3.0 – Tips and Tricks
(by R.Sonnenfeld 8/2008)

1. <u>Help on Mastering Physics:</u> The MP website has a student guide that is quite helpful. And Help is available on upper right of screen at all times. Try reading it if you find the software difficult to understand. What follows are the most common problems/questions I've seen students have, but are not intended to cover all the material in the online manual.

2. <u>Way to approach the problems:</u> Composition or spiral notebook is strongly recommended. Work the problem in your notebook, at least up to the part where you may need a hint. Then take it to the computer. Keep the full solution in your notebook for review. It will help you.

3. <u>Numerical Answer Precision:</u> Mastering Physics assumes +/- 2% accuracy for numerical answers. This corresponds to three significant figures. I recommend using four figures in your calculations, then rounding down to three figures at the end.

4. <u>Numerical Constants:</u>The first question you are likely to have about this is what value to use for g? We often say in class g=9.8 m/s^2, but the software uses the more precise value g=9.81 m/s^2. How would you know? Click the "constants" button in mastering physics. Whatever value they use for a constant there is what you should use in your calculations.

5. <u>Submitting Answers:</u> Most questions are multipart. After each part, click "submit". Once you've got it right, go on. When you've finished the ENTIRE PROBLEM, click the bigger submit button at the bottom. You need to do this to get credit. Don't forget.

6. <u>Coming back and finishing later:</u> You may have to leave after finishing one entire problem. It doesn't hurt not to, but then I don't think it saves your answers and you have to retype. Finished problems are saved. So if you had 9 problems to do, you could do it in 9 separate sessions (if you wanted to!).

7. <u>Vectors and Unit vectors.</u> The way MP wants to see the following
   $\vec{A} = 3.0\hat{\mathbf{i}} - 4.8\hat{\mathbf{j}} + 7.0\hat{\mathbf{k}}$ typed is \vecA=3.0*\hati-4.8*\hatj+7.0*\hatk

8. <u>Some more examples</u> of formulae formatted for Mastering Physics:

$\sqrt{\mathbf{v}_x^2 + \mathbf{v}_y^2} =$ \sqrt((v_x)^2+(v_y)^2) or ((v_x)^2+(v_y)^2)^0.5 or (v_x^2+v_y^2)^(1/2)

$\cos^{-1} \dfrac{\pi}{2} =$ acos(\pi/2)

$\sqrt{A^2 + B^2 + 2AB\cos\theta} =$ \sqrt(A^2+B^2+2*A*B*cos(\theta))

9. <u>Trig Functions.</u> atan(1)=0.785 (not atan(1)=45). Why? Because the trig functions in MP all work in radian mode, not degree.   Likewise to take sin(30)=1/2, really need sin(30*180/pi).

10. <u>Browser problems.</u> MP Works decently in Netscape for Linux. For Windows and Mac, it works in Firefox, Netscape and Internet Explorer. However it works best in Internet Explorer. If you find that you can't see some of the problem (a window seems to be cut-off or the like) try it in a different browser (Internet Explorer).

11. <u>Help on Symbolic Answers:</u> Your tutorial should have taught you how to enter symbolic values, but of course you may forget. If you forget, click the "?help" box next to the answer box. It brings up a summary of the formula rules.

12. <u>Scientific Notation:</u> Please note, MP does not accept 3..14E3 (unlike Excel or some programming languages). You must type "3.14*10^3".

13. <u>Grading Algorithms:</u> As I have it set up now, you lose 3% for each guess. If you get the problem on the 5th guess, you still get an 85%. I may tweak this as you all get better. If you don't ask for any hints, you get +1% for on the problem for each hint you didn't need. You can thus get more than 100% for the problem. I encourage you to ask for hints if in doubt. There is no harm in using them. If you start the problem but never get a right answer, you get 0%.   If the problem is a 4 part problem, you can get from 0-100% for each part. Your net score is the average of the 4 sub-parts.

14. <u>The After Problem Survey</u>: That gets to be annoying after a while. You never have to fill out a single one of them. I don't care whether you do. To get rid of them, just click "next problem" when you're done. You don't need to fill them out to get to the next problem. You MAY of course, fill them out. Any comments you make are e-mailed directly to me. I do my best to respond to these comments if they include a request for help or clarification.