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## SOME TIPS FOR SUCCESS IN STUDYING PHYSICS:

**Wonder.** Being a good scientist starts with wondering about the world around you. As you go through the course, look for phenomena in your everyday life or the natural world that relate to topics discussed in class. Consider a scientific explanation for things you observe, and bring your questions to class.

**Ask questions.** Asking questions during class is essential to your success. Try not to worry that your question might sound foolish—it's almost guaranteed that other students have the same questions. If your question doesn't get covered in class, see me during office hours or make arrangements to meet at another time.

**Keep up with the assigned problems on a regular basis.** Physics is more skill-based than knowledge-based: compared to a subject like history, there's not as many individual facts you need to know, but you need to be able to do a lot with a few basic concepts. This means that you can't just read the material, you have to *practice* it in order to understand it. You also need to give it time to sink in. When you learn a new skill like physics you're actually re-wiring your brain, building new neural pathways, and this takes time. Putting off the homework until a day or two before the exam is the most frequent cause of poor quiz scores. Start on the homework early, and work on it a little each day. You should plan to spend at least an hour or two every day on the homework.

Understanding the homework is more than just getting the right answer: be sure that you thoroughly understand the ideas behind the problem. To be prepared for the quiz, you should do the regular assigned problems and enough of the additional problems to feel confident that you would be able to solve a similar problems if it appeared on an exam.

**Do the problems more than once.** After you have solved the problems, do them over again a day or so later. Keep doing them over until you feel completely comfortable with the problems. You should reach a point where you feel that you could explain the problems to another person in class and answer all their questions about it – not just *what* you do at each step, but *why* you do it that way.

Also, try to imagine variations on the problem. What could be added to the problem to make it more complicated (but still solvable)? What other variables could be included or asked for? Then think about how you would go about solving these new variations. This will help to encourage your brain to learn new skills and techniques, not just memorize the steps to solve one particular problem.

**Don't get stuck in the text.** Use the text as a reference. Don't feel you have to understand every word in the text before you attack the problems. On the first pass, it's best to read the text just to get a general idea of the concepts discussed. Then try a few

of the problems. As questions come up, you can reread the sections of the text that apply.

**Don't get stuck on the problems.** It's tempting to want to stick with a single problem until you've solved it, even if it takes hours of your time. Don't do it—it's the best way to drive yourself crazy. If you get stuck on a problem for more than five or ten minutes, go on to the next one. Often, when you come back to the problem, you'll find you have some new ideas. If you're really stuck, go do something else for a while. Don't spend hours on a single problem — get help from a study group, a tutor, or me.

**Be patient with yourself.** It's not unusual when studying physics to go through periods where almost nothing seems to make sense. Frequently we'll be building up groups of concepts that don't make sense in isolation, but once you've worked with them a while you may get an “aha!” experience where several ideas seem to “click” in place. Give yourself time and keep working on the problems until you get that “click.”

**Form a study group.** The most effective way to learn physics is to meet regularly in a study group. If you're stuck on a problem, someone else in the group may come up with the “missing piece” that lets you solve the problem. If you already know how to do a problem, explaining it to other students helps to solidify your understanding. Talking through the problems with other students will give you to a much better understanding of physics concepts.

Most people find the study group works more effectively if everyone first tries to do the homework on their own before meeting as a group. This saves a lot of time and allows the group to focus on the points where people are having difficulties.

**See a tutor.** FREE tutoring in physics is available by appointment. Call extension 6682 at least 24 hours in advance to make an appointment. Tutors have been through this class before, so they understand your situation. Drop-in tutoring may also be available—I'll announce the schedule in class as soon as it's available.