

About Studying, Especially Studying Physics

When reading fiction, we typically go at a page a minute or more. The information density of a textbook is much too high to effectively read at such a high speed. One of the best ways to slow ourselves down and pay careful attention to all the information on the page is to take extensive notes while reading.

For Physics, successfully solving problems involves a high level of hand-brain-eye coordination, and the process of note taking is also a good way to establish this. Thus, for two reasons we recommend that as you read the textbook you take extensive notes, including:

- Definitions.
- Equations
- Figures

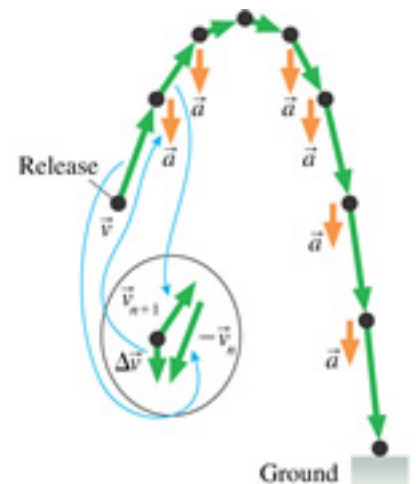
You should also go through all the steps of the Examples, and fill in any missing steps.

Whether you decide to keep your notes as a study guide or just toss them into the blue box is up to you. It is the *process* of note taking that is proven to help most students learn.

For example, to the right is Figure 1.22(b) from Knight's textbook. You can see that it is fairly complicated with many things and many labels.

Just looking at the figure it is easy to miss some of the details. But if you copy the figure in your notes you will almost surely not miss any of these details.

For most students, note taking in class is similarly effective for the same reasons. Thus, if I were going to use a figure like this in class I would avoid just showing it in, say, a PowerPoint slide. Instead I would draw it in steps. Perhaps those steps would be:



1. Draw the particle representations, the black dots.
2. Draw the velocity vectors.
3. Draw the vectors that are in the circle.
4. Draw the acceleration vectors.

Since I am drawing the figure in real time, I am fairly assured that you will have time to copy it into your notes.

If we were in a conventional classroom with a multiple-panel blackboard, I would probably leave the figure on one of the panels while we go on to discuss and extend it. Thus you can always refer back to it with just a glance. In Convocation Hall this is impossible; you will perhaps have noticed that instead I often will put the completed figure that I drew on the Tablet PC onto the side screens for you to refer to.