

## Your First Job is Learning

What is the best way to learn in college?

Here is some scientific evidence about learning:

- Learning is not something that happens to you, it is something that *you do*. You cannot be “given” learning, nor can you be forced to do it. Only you can cause yourself to learn.
- Learning is a biological process. Thinking occurs when webs of brain cells (neurons) send signals to other webs of brain cells. Learning is the process of creating those webs or networks.
- Learning has two parts and you must do both in order to learn:
  - Understanding
  - Remembering

Anytime you encounter a new idea you need to “make sense” of it, or, *understand* it. If you are actually trying to understand it, your brain cells are sending signals to other brain cells until one or more of them “sees” the logic in that idea. That’s the understanding part. Sometimes understanding comes in a flash of “Oh, I get it!” and sometimes it takes more time until we finally “get it”.

Making sense of what you read or hear involves focused attention and concentration, “brain work”. The big rule about understanding is that it *cannot* be done passively. It demands an active and focused mind.

Some very bright students find it easy to understand what they see and hear, but they still get poor grades. The reason is they neglect the second part of learning: *remembering*. For most people remembering is probably more difficult than understanding. Memories are more than ideas, pictures, or events that you need to “find” in your head. Memories must be *reconstructed every time they are remembered*. This means firing up those same brain cell signals that were used the first time you heard or saw that idea. This is not always easy to do. Here’s why:

**Use it or lose it:** The connections your brain cells made the first time you understood something may not be permanent connections. If the connections you made gets used a lot, that network will be stronger so it doesn’t fall apart. If that connection doesn’t get used, it dissolves and will be gone forever. This means that you must use or practice what you want to learn, so that you create a strong network in your brain.

Because learning requires means both understanding and remembering, we have to practice what we understand. If we don’t, the connections will gradually disintegrate and we can’t remember what we once understood.

Remember: learning is the goal—if you have learned, the grades will take care of themselves.

**The Classroom:** Many students waste a highly valuable learning environment, that is, the classroom. The classroom is a valuable place to talk about the content and ask questions related to the content. The most common misconception is that the class period is when the instructor tells you what you need to know to pass the tests. From there follow bad habits that make learning more work and less interesting than it can or should be.

**Taking notes.** Too often taking notes means copying what's on the board or screen. Trying to do this, or writing down everything the instructor says has the awful effect of turning off the *listening* part of the brain. We can't focus on two things at the same time—we'll miss what an instructor is saying while concentrating on writing or what she or he said, or copying from the board. Is getting all the notes or slides from the instructor the answer? No, that will only cause you to be passive as you sit, daydream, doze off, or stop coming to class. How to take notes (or "make" notes) is described later. First, it will be helpful to explain the difference between information and knowledge.

**Information and knowledge** mean very different things. The world is filled with information. All the books in the library have information as do journals, magazines, and websites. But, none of this is knowledge because knowledge can only exist in someone's head. In a classroom, all your teacher can give you is information, and maybe the inspiration for you to do your part. If you "make sense" of new information you can construct your own knowledge by using this new information and incorporating it into what you already know. This involves using some not-used-before brain cell connections. So if you want to remember what you now understand, you must practice (review many times) and use the new knowledge repeatedly to solve problems and answer questions. Remember the rule about new knowledge: use it or lose it.

### **Now what?**

Describing the brain cells, information and knowledge is more than theory, it *is* how we learn. The way to learn, then, is to align your activities with behaviors we already know will work.

**Prioritize your time.** Sleeping is a high priority for everyone—it's a biological necessity like food. What about after that? For someone who has to work part time, work is a high priority and losing the income could have serious consequences. So, after sleeping, eating, working, and going to class, the rest of your 168 hours a week are spent doing whatever you find personally important. Everyone has the same 168 hours of time in a week. It's your priorities and not the clock that will determine the outcome of your college experience. If it's really important, it will always get done, and always at the expense of something less important.

**During the lecture.** Abandon the idea you can sit, "take notes", and worry about it later. A key idea to bring with you to every lecture is to *worry about it now*.

You can look at your instructor as an adversary, someone who stands between you and a diploma, but that will only frustrate you. It's better to think of the instructor as your private tutor. Most teachers welcome a thoughtful question about the content and resent questions like "*is this going to be on the test?*" When notes are not given, you have to make them. It takes careful listening, concentration, and a focused mind to pick out the important information. A remark like "there are several reasons we believe these things happen" is a clear clue that something worth knowing is coming. In order to make notes that you can learn from, you have to pay attention to what is being said and learn quickly how to determine what is important information, and what is filler or rephrasing. You have to write down the gist of the important information. Picking out the important information and writing down enough to remember what you understand takes focus and practice.

**About interests.** You might think "*I like hockey, but I have no interest in history*" or chemistry, for example. This may be true and what is also true is *all of your interests had to be learned!* You need to

*know something* about a musical instrument, a sport, even an academic subject, before you can judge whether or not it is interesting. But if you think you cannot learn anything *until* or *unless* it's interesting, then you can never get started on anything new.

**Between classes.** When a teacher happens to not assign some specific work to be done for the next period, a disturbing number of beginning students simply assume that means nothing at all needs to be done. When told to *study* but given nothing specific to do, they do nothing. Here are some realistic suggestions for study outside class time.

**Fill in the notes.** It is essential during a lecture to produce some record of what was presented during that class period. A most useful and highly recommended way to spend half an hour or so of study time is to make sense of these notes, and most importantly, turn lists and key words into real sentences that rephrase what went on. If you can't remember, your best resource is your textbook. Even if specific page numbers are not indicated, use the table of contents, chapter headings and the index to find what you need.

**Reading.** Now, read with the intent of re-discovering what was presented in class. Read with the goal of understanding. Many people say *most* learning in college goes on outside the classroom. So, you will know more about the day's material after this "filling in" process than when you first heard it. But you must write in your notes, in real sentences, what you have learned from the reading. Always write what you have learned. There are two other good resources for filling in the notes if the textbook is not enough: your classmates and the teacher (or a tutor if available).

**Connecting.** Many studies have found that the most successful students got "connected" to the teachers who were open to talking with students. They became more familiar with course content by simply discussing it with an expert. The second most important activity for success was to form small study groups or pairs to talk about course content, their notes, and assigned work. Working together on assignments and problems is not cheating. Copying without learning is cheating. Discussing the details of an assignment or problem is cooperative learning and is one of the most useful habits you can develop in college.

It is well documented that for thoughts to be useful, they must be verbalized—spoken to another person or written on paper. You need verbs: What did what to whom? How does this thing cause that thing to happen?

**Assignments.** You can think of assignments as something you have to do, or as *something to be used*. Assignments are what the instructor thinks is important enough to spend time learning. Don't just *do* assignments, *use* them to learn something new.

**Access and technology.** Remember the difference between information and knowledge. Knowledge has the potential for improving the individual and society. But websites do not have knowledge; all they have is information; some of it is not reliable, or just wrong. No matter how many websites you have access to, none of them can do anything for you unless you can make sense of it and evaluate what you find there.

**Exams.** If you attend class regularly, listen with attention, make the best notes you can, fill them in later (preferably with a study partner or two), verbalize your thoughts, and use assignments as learning tools, then you would be ready for a test any time. Learn as you go means you're always prepared. Of course in the real world a "big test" makes even the best student nervous and everyone uses some extra time to make sure she/he is prepared. This means review, literally. It means learn again, not learn for the first time. No one can learn the content of 15 to 20 lectures in two days. Learning a second time, a real review, is a snap compared to learning from scratch. So, review for an exam should not be stressful. But how do you review?

**Don't go it alone.** Schedule some firm times with your study partner(s) to spend an hour or two reviewing. It's never too early to start reviewing. If you *talk* about the content and *write* summary paragraphs or descriptions, make labeled diagrams, solve problems on paper, you won't forget, guaranteed. Be active, not passive in reviewing.

**Don't "pull an all-nighter".** Cramming for an exam focuses on using short term memory. But, most college work demands thinking about, and using, a storehouse of information lodged in long term memory. If you follow these suggestions you can do something instead of cramming that will be better for you and your brain: get a night of restful sleep the night before an exam. It will not wipe out what you've been studying. In fact, there is a small but significant increase in the ability to recall or reconstruct when learning is followed by sleep. So if you want your brain to be ready for an exam, do your reviewing in one or two hour periods spread out over several days, and get a real night's sleep before the exam.

**During the exam.** Demanding instructors prepare exams that require performance, that is much more than recall. Many exams include "application questions". That means you can't just write what you know, you have to use what you know to answer a question or solve a problem that you haven't seen before. So when seeing something that looks unfamiliar, convince yourself that it's only a question that is asking you to apply something you already know. If you have learned well and reviewed properly, you can be confident that you have the necessary knowledge. It just takes some hard thinking to see how it applies to a particular question.

### **Summary**

No one learns unless they want to. Learning is a biological process that relies on the brain. The brain demands maintenance just like other parts of the body; don't abuse it. Learning is the only way, and learning is difficult and requires effort. But, when you do it right, it is marvelously satisfying.

Revised by Susan Gallanis.

This paper is a condensed version of *Learning (Your First Job)* by Robert Leamnson, PhD, retrieved March 21, 2014 from <http://www.udel.edu/CIS/106/iaydin/07F/misc/firstJob.pdf>