

How not to Study

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Many people have developed bad habits that impair learning. You may even have had a well-intentioned teacher or friend advise you to do these things. All of these bad habits contribute to an illusion of mastery without effectively contributing to real, lasting learning.

Students often come to my office after an exam and say “I don’t understand why I failed the test: I studied hard, and I really knew and understood all the material.” After further investigation, it almost always comes out that instead of doing the things outlined in “How to Read a Math Book,” they instead used one or more of the following bad strategies.

Bad 1. Reread the whole section again.

Running your eyes over the text again does not help learning, but it makes the words and equations *feel* familiar, which gives you the misimpression that you know the material. People who reread the text superficially score worse on tests than those who do no reviewing at all, and they score much worse than those who use outlining and self-testing methods.*

Bad 2. Underline or highlight key words in the text.

Highlighting and underlining tempt you to reread, and they further contribute to the illusion of mastery without contributing to actual mastery. Instead, make your own outline of the main ideas on a separate piece of paper.

Bad 3. Insist on completely mastering one thing before you move on to another.

Trying to learn one thing perfectly before going on to the next has the same bad effects as cramming before a test or trying to get in good physical shape the day before a race.

Spread out your learning into multiple sessions with other activities in between (like learning a different subject). This allows your brain time to process and solidify concepts and make connections to other related ideas.

Spreading out your learning also forces you to work harder to recall what you learned earlier, which may seem bad to you now, but doing this harder work now will make it easier to recall later—on the test, or in life, when you really need it.

* It is OK to reopen the book to spot-check your self quizzes, compare with your outline, or clarify a point you don’t understand. But stay focused on answering specific questions—don’t read without a clear goal, don’t let your eyes just run over the text, and *don’t reread the whole section*.