



York Science Department

Steps students can take to be successful in ANY Science class!

- Work with the **objectives** and **learning targets**! Do not just “answer” each one, but group them to form detailed connections and explanations! Actually take time to WRITE out your answers... don’t just “think” about the answers! Can you answer them at the end of the period or by the next day? Those are the driving questions for the day’s goal. Work on them throughout the unit... seek out help when you get stuck or have a hard time connecting certain ones together. At the end of class or take a few minutes at night to make a model, diagram, concept map...or all three! What are common themes, examples, applications, connections between daily objectives and learning targets? When you look back at your objectives, redo the problems or write out key ideas without looking at the answers.
- Take notes while watching screencasts (YouTube videos/Animations that are assigned) or when in class. Summarize the important parts, do not write down everything. Rewind and rewatch parts if you do not understand something. Utilize [reading/note strategies](#) as often as possible, even when the teacher does not require it.
- If you are still shaky on some of the material, go back to the notes, your book, labs and activities, or **SEE YOUR TEACHER** for help! Have specific questions or problems to go over with them. If the course has them, listen to screencasts (or parts of them) on a regular basis before the test.
- Review and actively use class resources (this includes textbooks!). Do you study the images/captions? Do you answer the questions at the end of each section? Do you use the questions at the end of the chapters? Do you do the practice tests at the end of the chapters?



York Science Department

How do I Study for a Science Assessment?^{1, 2}

The idea of “studying” is a concept that students think they understand. However, when they are asked the following questions, they are surprised to find that what they call “studying” may not be all that effective in learning and remembering.

Pretend for a moment you are in this situation and I ask you these questions. How would you answer?

- Did you make a list of key concepts from the learning materials to test yourself?
- Did you take the main concepts, define them and use them in a paragraph?
- While you were reading, looking through notes, or watching videos, did you convert the main ideas into questions and quiz yourself later?
- Did you take the main learning concepts and rewrite them in your own words and check them against your learning materials?
- Did you relate the new material to things you already had studied in the past?
- Did you relate the topics in the new material to each other using a concept map?
- Did you look for clear examples of the learning concepts and write why these are examples?

In order to properly study, students have to be active with the learning material. They cannot simply read, take notes and reread. They cannot cram one night before a test. They cannot just prepare if there is a test coming up. Being proficient in science takes work and this work must be smart, consistent, and organized.

Students often think that by paying attention in class or taking notes that they will automatically understand the concepts. This is not the case and often figure out that they did not know the material well enough after they take the summative assessment. There can be a sense of overconfidence or false sense of security.

The three biggest mistakes kids make when studying are:

1. A failure to know the areas in which their learning is weak.
2. A choice of study techniques that leave them with a false sense of mastery.
3. Only studying when they have a quiz or test. You study to learn. This should happen each night if possible, even for 10 minutes.

¹ Many of these strategies are adapted from *Making It Stick: The Science of Successful Learning* <http://makeitstick.net/>

²Adapted from Bob Kuhn



York Science Department

FIVE Evidence-Based Study Strategies

(to use for all your classes)

1) Retrieving Things From Memory

- Instead of rereading, use self-quizzes or flashcards.
- As you work with your learning materials, pause periodically and ask **(without looking!)**: What are the main ideas? What information or terms are new to me? How does this stuff relate to what I already know?
- Use end of chapter questions, Quizlet, or generate your own quizzes (exchange them with a friend).
- When you quiz, go back and see if you are correct and if not, why?
- Identify weak areas and focus on how you can get stronger in those areas.

2) Spacing Out Studying

- Make flashcards each week. As you learn the material and feel you have mastered it, make a “weekly pile” for those cards. The other, unmastered cards stay in your “working” pile. Weekly (maybe on Thursday), go over your working pile and your weekly pile. New mastered cards add to your weekly pile, while cards you still know well in your weekly pile get transferred into a new pile called your “bi-weekly” pile or your “monthly” pile depending on your choice. As you master cards, they move from pile to pile. New cards will be added each week to your working pile.
- If you are not using flashcards, revisit notes or lists of concepts you are weak on periodically so you come back to them and review. Review those concepts you know well, less often.
- Interweave concepts. This means that if you are studying enzymes one week and photosynthesis the next, don’t study one to completion, but alternate between them so you refresh your mind on each topic as you come back to it.
- Spacing out practice is good. You want a little bit of forgetting so you make your brain work a bit to remember. This builds really good long-term effective learning.

3) Relate To What You Already Know

- Write out how a concept you are studying relates or connects to other concepts.
- Explain what you know to another person in your class and have them do the same. Have a conversation about similarities/differences in your explanations.
- Use analogies, drawing models or concept maps to connect learning to other learning.

4) Generate Answers

- You will get your objectives in advance of classroom instruction. Before doing any learning on your own, work through the study questions. Then go and read or interact with the objectives to see how you did and what you left out.

5) Reflection

- At some point during the day after you learn something new, use your notebook or a Google Doc to review what you learned. Ask: What went well? What have you learned before that this relates to? What else do you need to know?

What does it mean to “Study”?	
Studying <u>IS</u> 	Studying is <u>NOT</u> 
• Concept FlashCards • Quizlet • HeadBands with friends • Self-Quizzes • Self Quizzes with 5 and 5 • Group Study • Identification of objectives not understood and relearning them • Card sequences • Concept maps • Rewrite and summarize information from the book reading, in class presentations or handouts in your own words. • Relate new items to other items you already know. Explain in paragraphs. • Read or watch a screencast and then write out your own summary using a reading strategy. • Explain a complex process in your own words after studying, and then compare your work with that of the book or information piece. • Note exchange with another student to see how they compare. Discuss and revise. • Make your own quiz for a friend and them, you. Take the quiz and correct your mistakes. • After getting a quiz or test back, determine why you missed what you did and write out the correct answers for future studying. • Short videos or animations and then writing the concepts out in your own words. Watch the video again for clarification.	• Rereading the book • Writing notes from the book over and over • Rereading your notes from class • Rereading or memorizing a study guide • Memorization without knowing underlying principles • Cramming • Not reviewing missed test items • Memory Flash Cards • Highlighting notes

Suggested Reading on Learning Better

[Strengthening The Student Toolbox](#) by John Dunlosky

[Test-enhanced learning: Using retrieval practice to help students learn](#) by Cynthia Brame

[Make It Stick](#) by Peter Brown