The following are some study skills and techniques based on educational research and will help you succeed in biology and chemistry at Dartmouth. These courses are not based on ability to simply recognize information; they test recall, pattern-recognition, and your capacity to problem-solve. Study techniques you may have previously relied on, such as re-reading material and highlighting reading, will not be enough to help you have a thorough understanding. The most thorough learning is effortful, not mindless repetition.

I. Testing is a very effective way to learn. Studies show that people who are tested on material retain more information than people who are simply re-exposed to material.

   i. Self-quiz with questions in the textbook. Write out or verbalize your entire answer to ensure that you have a full understanding.
   ii. Make up questions of your own to check your knowledge of concepts.
   iii. Study with others and test each other! Go through lectures slides or readings and devise questions to test one another.
   iv. Space out self-quizzes. Spaced practice, although it may feel inefficient, actually helps strengthen connections.

II. Put the material in your own words. Check your understanding by pretending you yourself are teaching the material. See if you can accurately explain the concepts. Studying as if you are planning to teach will help you understand and remember more material.

III. Mixing it up is better than massed practice. Don’t focus on any one topic for a long stretch of time. Interleave distinct topics from within one class or mix your studying from all three classes. This allows your brain time to digest the information, will help you relate material to other topics, and strengthen retention of material.

IV. Read actively. Pause during reading or studying to test yourself on the key concepts or vocabulary of what you have just read to ensure that you are engaged.

V. Make diagrams or flow-charts to visually represent a process. This can be very helpful for specific topics. For example, you could draw out the process of glycolysis and respiration with intermediates and where steps occur in the cell.

VI. Space it out. You benefit more from spacing studying over several weeks instead of cramming. Spend a little time each day going over main points from lecture instead of hours right before an exam.

VII. Map out the big picture. How do all the topics in class so far relate to each other? How do the topics relate to materials from other classes? Draw maps by breaking the materials up into chunks, and then connecting the chunks based on relation. When you look at questions or new materials, think about how the question or material fits into the map.

VIII. Vary where you study! Avoid multi-tasking! Seek a quiet & “non-social” spot to study!

IX. Take advantage of course resources (office hours, TA study groups, on-line discussions). Come to these sessions prepared and with questions. Don’t be a passive listener. Questions need not just be about areas of confusion (example: you could ask “I think I understand what entropy is. May I explain it to you?”). If you are in a group session, realize that many other folks there are seeking clarification of many of the same points you are.

X. Take note of what you find confusing. If you stumble across a question that you’re stuck on or a part of the lecture that confuses you, make a note of it. Review the questions later on, or bring them to office hours!

XI. Be a self-directed and self-motivated learner! Don’t wait for the faculty & TAs to come to you with information. Don’t wait to see ”how you are doing” until the first midterm. Be pre-emptive and establish your study habits early in the term.

True learning in these course can be difficult and setbacks are normal and ok. These “setbacks” generally lead to more solidified learning in the long run so don’t worry if things aren’t clicking immediately! Reflect on ways you study to see what works for you.