Study Skills

Success in college, and particularly in a science class, will depend on the study skills you apply to your learning. In this class we will apply study techniques to help you successfully learn some of the fundamentals of biology that are based on "levels of biological organization."

Many times students think that learning science is very difficult and only the smartest students can be successful, but this is not true. Being successful requires developing a strategy for learning. Students who succeed have three things in common: they apply active study techniques, use good time management, and learn how and what scientists think. Applying these strategies will not only help you be a better biology student, it will help you to be successful in all your classes.

Active versus Passive Learning

When students are asked what it takes to be a successful student they say things like: come to class, take notes, pay attention, read your assignments, and study hard. These indeed are important techniques to use, but doing each of these does not promise you success – success depends more on how you do each one. To understand this we must distinguish between passive learning and active learning.

While learning can only happen if you make yourself available to learn by coming to class, taking notes, and reading your assignments, each of these can be done in a passive manner that will only fool you into thinking that you are learning. **Passive learning** is the technique that most students use in classes, but with limited success. Passive learning is when you listen to a lecture, read a book, or watch a video allowing yourself to receive information without putting out information yourself. In this case you are being a receptacle for information that might not stick and this does not prepare you well for the active process of exam taking!

Have you ever read every word of a passage in a text and got to the end of it and thought, "I don't have a clue about what I just read?" If you have done this you are not alone! Perhaps your mind drifted to something you needed to do after you finished reading, or perhaps you were too tired to concentrate, or perhaps the vocabulary in the text had words you didn't know, or perhaps you did understand each sentence and just could not retain it. Likewise it is not uncommon for students to listen to their instructors and take notes by writing down everything they write on the board. By doing so students often follow a lecture thinking that they understand it, but if they were to attempt to explain that lecture to someone else outside of class they would find that they are unable to do so.

An **active learner** does much of the same activities as a passive learner, the biggest difference is that he or she does not idly receive information. Instead active learners actively participate in absorbing the information. One of the main goals of this class will be to help you to know how to do this.

Let's consider the examples above. If you take notes on what you are reading, or better yet summarize that reading in your own words you will have to be a lot more focused on the information, stopping to think it over, look up unknown vocabulary, rereading a phrase that is challenging to understand, and as a result you will comprehend your reading much better.

Students who listen carefully to a lecture and write notes to themselves summarizing what the teacher said will be far more successful than if they just copy what they saw written down.

What kind of a learner have you been in your previous classes?

Active Learners

Here are some basic guidelines to becoming an active learner:

1. Active learners come to class prepared to learn. They do so by being on time and having the materials they need, such as a notebook and pencil, ready and organized when class begins.
2. Active learners have read their books and completed their assignments before class.
3. When reading or reviewing notes active learners ask themselves questions and try to answer those questions. They also predict what questions might be on the exam.
4. Active learners sit in the front of the class were they will be able to focus and not next to a friend who might distract them.
5. Active learners are alert and wear an expression of interest during class.
6. Active learners take good notes that go beyond what the teacher presents in writing.
7. Active learners ask questions for clarification or for checking their understanding.
8. Active learners try to figure out the purpose of an assignment or lecture. If they can not figure this out they ask the teacher for guidance. They use this information to help them think about how an exam question could be written.
9. Active learners make connections between lectures.
10. Active learners sort out important from less important details when they are reading or studying.
11. Active learners think about what they are learning! When they leave class they quiz themselves on what they learned in class that day from memory.
12. Active learners practice using their new vocabulary. Unfortunately, there are many new words you will have to learn in a biology class because these terms are not in most people's vocabulary. It is impossible to answer a test question if you do not understand the vocabulary in the question or know the vocabulary necessary to give the expected answer.
13. Active learners explain concepts aloud to themselves to test if they understand the concepts and would be able to explain it on a test. It is not adequate to think about the answer, saying it aloud is a much more powerful tool.
14. Active learners tell someone about what they are learning. Explaining a concept to someone else is extremely helpful and can be fun. If you do not understand the material you will find that you are not able to adequately explain it and this will enable you to go back and review the parts that confuse you.
15. Active learners form study groups with other active learners. To be successful, members of the group should have studied the material before the study session. A member of the group who says, "I didn't have time to learn the material but I want you to tell me about it" is being a passive learner and will not benefit much from the session. When people are prepared they can focus on topics they are having difficulty understanding.
16. Active learners review their assignments that have been returned and make corrections so that they will know the information on future quizzes and tests.
17. Active learners apply what they are learning to their everyday lives. This makes learning more interesting and also gives them reminders about what they are learning scattered throughout their day.

Above all: challenge yourself and be determined to do your best in class. Most students who do poorly in classes do not use active study techniques.

Which of these techniques have you used in the past that would make you an active learner?

Which of these techniques will you concentrate on using this week?

Time Management

One of the biggest challenges students have is learning how to organize their time so that they can get study time in and their work done. Here are some tips and guidelines to help you:

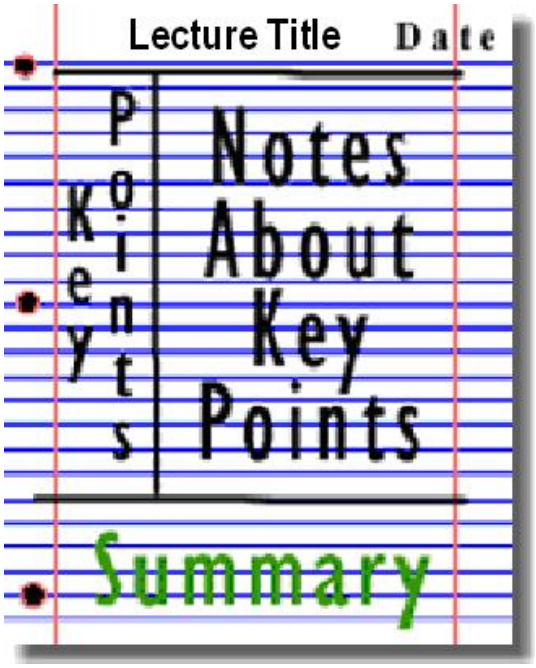
1. Keep a **calendar** of all the things you need to accomplish in your classes. Add your work schedule and other important dates. In this class we have provided you with a calendar of assignments to get you started, but it would be helpful to transfer these assignments to another calendar that includes your other classes and personal obligations.
2. Keep an organized notebook. One of your assignments will be to organize a notebook in sections and keep your papers in order. When it comes time to study you will find all the materials you need without having to dig around.
3. Make a "to do list" or check off completed tasks on your calendar.
4. Find a quiet place to study away from distractions. Get away from the television, conversations, or music. Save these activities for times you can focus on them.
5. Think what you learned in class soon after the lecture. Then think about the course material again while you are driving home, waiting in a grocery line, doing dishes, or brushing your teeth. By doing so you are being an active learner without setting aside additional time to study.
6. Schedule time to review your notes and edit them as soon as possible after hearing a lecture. Generally we forget most of what we learn within 24 hours, therefore it is much more efficient to edit your notes while they are still fresh in your mind.
7. Schedule study times throughout the week. Generally 40 to 50 minute blocks are best, followed by an active 10 minute break – where you get up and move around!
8. Schedule adequate time to study. The expectation for a college-level class is that you will study two hours for every hour you are in class. Depending on the strength of your background you may decide to adjust the amount of time up or down.
9. Schedule time for review several times a week.
10. Vary your activities to reduce boredom. Do not do all the active assignments first. Complete your reading while you are still fresh.
11. If you are having trouble, ask for help right away. If you wait too long the problems will accumulate and you may find it difficult or impossible to recover.
12. Get ample rest, give yourself time to play and exercise, and eat a good, healthy diet. Your performance will improve if you are healthy and relaxed.

Notetaking

Good notes are the most valuable study resource you will have in most classes.

13. Come to class with paper, pencils or pens.
14. Organize your papers in a 3-ring binder; this will allow you to insert handouts, assignments, and exams.
15. Do not limit what you write to copying what the instructor presents in writing.

16. When taking notes, write as much as you can but focus on ideas or concepts versus specific details or facts.
17. Write your notes in an informal outline form. Leave space to fill in later, especially if you get behind.
18. Use abbreviations and incomplete sentences.
19. Underline key words or stressed points.
20. Try using "Cornell Notes:"
    a. Divide your paper into three sections.
    b. Write the lecture title and date at the top of the page.
    c. Write your notes about key points on right hand side only.
    d. Reserve the left-hand side for writing key points, keywords, or phrases, or questions.
    e. When you review your notes, write a summary of the main ideas at the bottom.
    f. Instead of recopying your notes, add details or clarification. This can be done on the bottom of the sheet.



Reviewing Notes and Completing Study Guides

Good notes are the most valuable study resource you will have in most classes. In this class you will also find the study guide questions are also extremely helpful in preparing for quizzes or exams.

1. Go over your notes as soon as possible after a lecture, preferably the same day.
2. Fill in any details you skipped.
3. Check your reading for understanding concepts that are not clear, and then add clarification to your notes.
4. Answer your study guide questions as you review.
5. If a concept is unclear jot down a question about what is unclear. Think about questions while referring to your notes, reading, and study guide. Next try to guess an answer to the question, and write it down.
6. If no answer to your question comes, ask yourself again later. If still no answer comes, ask again before you go to sleep, etc. During the time in between while you are doing something else your subconscious will work on the problem and oftentimes the answer will pop into your head.
7. If you still can't get the answer by the next day discuss it with a classmate.
8. If that doesn't work, ask your teach to help. Do not set a concept aside until you understand it!
9. Review your notes often. Make sure you review your first notes before the second lecture. Then review the first two lectures before attending the third, etc. This will greatly help with recall and keeping up with topics that build on each other in biology.