

The Study Cycle for Math and Science

Each time we learn something new, our brain creates a new connection. We strengthen that connection each time we engage with the material again, making it easier to recall later. The Study Cycle is an effective way to spread out studying over several weeks instead of cramming right before an exam.

PREVIEW

Before class, briefly preview the material to be covered during the upcoming class period.

Checklist:

	Read the introductory and summary passages, section headings and subheadings, and diagrams of the assigned reading.
	Look at the problems at the end of the chapter.
	Make note of new terms and theorems.
	Review old terms and definitions referred to in the new material.
	Record possible questions for class.



ATTEND CLASS

Make the best use of your time by actively listening when attending class.

Checklist:

	Write down the instructor's explanatory remarks about the problems.
	Note any concepts, rules, techniques, and/or problems the instructor emphasizes.
	Ask questions of your instructor during class about any unclear concepts or procedures.
	If you miss something or don't understand the information being presented, write down what you can, especially key words. Skip several lines to give yourself space to fill in the information later.



REVIEW

Reviewing your notes as soon as possible after class is a key step to retaining the information long-term.

Checklist:

	Read through your notes to get an overview of the material and check for errors or omissions.
	Fill in any information you missed during class. Pay specific attention to explanatory remarks that you didn't have time to write down or that the instructor did not provide.
	Use the back of this page to write a summary of the material in your own words, list key terms or formulas, and rework examples. Also include supplementary notes from the textbook.
	Note any relationship to previous material. You might write down key similarities and differences among concepts in the new material and concepts in previously learned material.

Review in Action

Use this area to write a summary of the material in your own words, list key terms or formulas, and/or rework examples. Also include supplementary notes from the textbook.

CHECK-IN TIME!

Test your strategy! Regular check-ins can help ensure your techniques are working.

- ⇒ Identify the major concepts and formulas. Describe concepts using words or images. Talk it out or draw it out!
- ⇒ Read a concept, look away, then see what you can recall. Work toward understanding. Glance back, reread it, and focus again on recall and understanding.
- ⇒ Create a summary sheet of formulas and processes, noting when to use and why.



STUDY

For a problem-solving course like math or chemistry, much of your study time will be spent working on or studying problems. When it's time to work through problems, use the checklist below.

Checklist:

	Read through the problem at a moderate speed to get a general overview of the whole problem.
	Read through the problem again to figure out what it's asking. Write down all the information that's provided in your own words.
	If appropriate, draw a diagram and label the givens.
	Devise a plan to solve the problem. Refer to the tactics below this table for suggestions.
	Carry out the plan you've devised.
	Check your solution.

Tactics for Solving Problems

1. Form relationships among all facts given.
2. Think of every formula or definition that might be relevant to the problem.
3. Work backwards and ask yourself, "What do I need to know in order to get the answer?"
4. Relate the problem to a similar example from your text or notes.
5. Solve a simpler case of the problem using extremely large or small numbers and then follow your example as if it's an example from the book.
6. Break down the problem into simpler parts. Work part of the problem and see if it relates to the whole.
7. Guess an answer and check to see if it's correct. The method you use to check your answer may suggest a possible plan.
8. If you can't make any progress, take a break! Return to the problem later with fresh eyes.

Tips for Success

- **Don't resort to an example too quickly.** Try to power through or only look at the first part of an example to see if you can take it from there.
- **Check your homework for errors before hitting submit!** Build a habit of relying on your own proofing abilities instead of relying on homework software.

CHECK-IN TIME!

After working a problem, analyze it. This helps expand your understanding of the concepts used and increases your mental flexibility for dealing with similar problems in the future. Focus on the process used (not the answer) and ask:

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| ⇒ What concepts, formulas, and rules did I apply? | ⇒ Can I do this problem another way? Can I simplify what I did? |
| ⇒ How does the solution compare with work examples from the textbook or my notes? | ⇒ Explain each step using your own words. Write these explanations on your paper. |



SELF-ASSESS

It's important to self-test to check your knowledge and strategy effectiveness.

Checklist:

	Scan your notes to determine what topics, problems, and/or concepts have been emphasized.
	Do a deeper review of your notes and the text. Make a concept list in which you record major concepts and formulas that will be covered on the exam.
	Review and rework homework problems, noting why the procedures applied. For a cumulative final exam, do the same with old tests and pay specific attention to questions you got wrong, making sure you can identify what errors were made the first time.
	Note similarities and differences among problems. Do this for problems within the same chapter and for problems in different chapters.
	Take practice tests, either from the Test Bank in Freeman Hall or one you make yourself. Consider creating your own test questions to predict what you might see on the exam.
	For a cumulative final exam, create your own practice test with blank questions from previous tests you've taken.
	Check your solution.

Tips for Success

- **Practice working problems out of sequence.** For example, work on a problem from Chapter 7, Chapter 5, then Chapter 10. This will reveal how problems relate to each other and simulate the test-taking experience.
- **Mix it up!** Don't stick with repetitive practice examples or just read through problems where the solution has been worked out for you. Look for challenging problems!
- **Work with a time limit.** Aim to solve as many problems as you will have on the test within the test time limit.

CHECK-IN TIME!

After taking a practice test, answer the following questions to improve your test preparation techniques:

- ⇒ Did most of the test come from the lecture, textbook, or homework?
- ⇒ How were the problems on the test different from those in the notes, text, and homework?
- ⇒ What was the source of most of your errors (careless mistakes, not enough time, difficulty understanding questions, test nervousness, etc.)?
- ⇒ How can you change your study habits to adjust for the errors noted in the previous question?