

## Study for Problem-Based Exams with Interleaving

Imagine you are preparing for an exam that requires you to solve problems, such as a math, chemistry, criminology, or an accounting exam. How would you study? Would you study chapter by chapter?

In this learning aid, you will try out a technique called interleaving. By incorporating interleaving into your study strategies, you are likely to enhance your test performance when doing a problem-based exam.

### Studying for Problem Based Exams

When you study a problem-based course using a textbook, you often encounter one new type of problem each week. When you study, you may find yourself working on the same type of problem until you master it, before moving on to another problem type. Using this method, you may feel that you are mastering the problems well, but later find the exam more challenging than you expected. Why is this?

When you reach your test or apply your knowledge in a real-world situation, you will be faced with a variety of problems, presented in an order that is different from the text. Your first challenge when seeing these problems is to determine **what the problem type is**, before moving on to finding a solution. Studying problems in textbook order is typically not an effective way to develop this skill. What works better?

### Using Interleaving

Interleaving is a study technique with two characteristics:

- (1) You space out your study of different problem types over time; and
- (2) You intentionally mix up the problem types you study in a single session.

Switch between topics  
during a study session.  
Don't study one topic  
for too long.



Go back over these  
topics in a different  
order to strengthen  
your understanding.



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Let's apply this concept to a simple example. When you learned basic arithmetic you learned to add, subtract, multiply, and divide. You could practice these skills one by one. However, in the real world, you may need any one of these four skills at any point. You need to identify which operation is the right one to solve your problem, and then use it to solve the problem at hand.

### Apply Interleaving Principles

How would this apply to your study for a test or exam? First, you will want to organize multiple, short study sessions rather than one longer session. This is called distributed practice, and it has been shown to be a more effective way to learn material in a way that will stay with you in the long term. Second, you will want to intentionally practice different problem types in the same study session. For example, if your book has practice problems, you will choose a few from each of a few different chapters or topics to practice at the same time. If you study with a study group, you may wish to create practice tests for each other that intersperse different types of questions – as you would experience on an exam.

### What if it Feels Awkward?

When you first begin using interleaving, you may initially feel that your study process is harder, and that you aren't learning as quickly. Stick with the process. One key study has demonstrated that while practicing the same problems in sequence initially helps you do them faster, this practice is less effective in helping you be successful in test or exam situations.

If you persevere through the challenge of interleaving, you will be strengthening your learning in the long run, allowing you to retain the material for your exams, and preparing you to use the material throughout your future learning and career.

Incorporating interleaving into your study is a proven strategy to enhance your preparation for problem-based exams. Shifting your study in this small way can lead to significant change in your results.

**Reference:** Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving Students' Learning with Effective Learning Techniques: Promising Directions From Cognitive and Educational Psychology. *Psychological Science in the Public Interest*, 14(1), 4–58. <https://doi.org/10.1177/1529100612453266>