



Retrieval Practice
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Retrieval
Guide

HOW TO USE RETRIEVAL PRACTICE TO IMPROVE LEARNING

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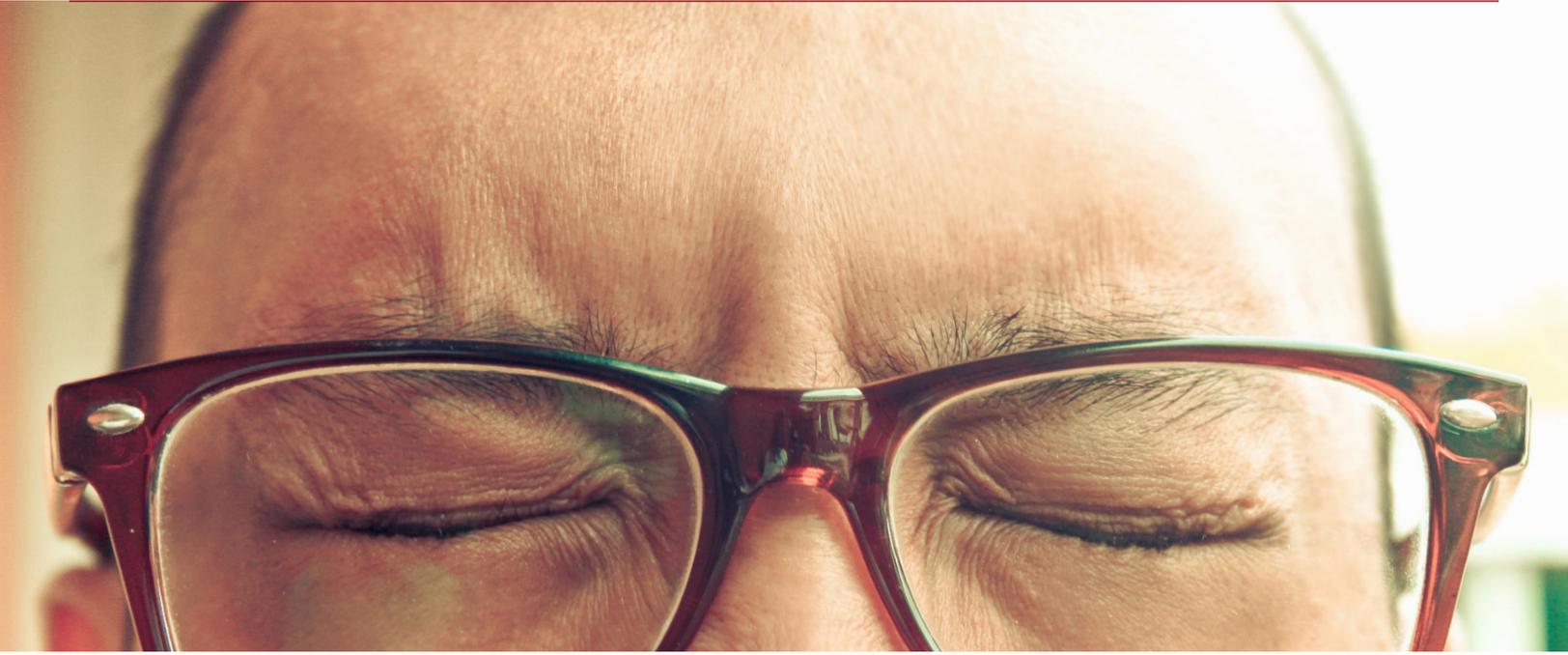
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What if you could raise students' grades from a C to an A? The solution isn't technology. It's not more money. It's not more class time. Curious?

When we think about learning, we typically focus on getting information into students' heads. What if, instead, we focus on getting information out of students' heads?

"Retrieval practice" is a learning strategy where we focus on getting information **out**. Through the act of retrieval, or calling information to mind, our memory for that information is strengthened and forgetting is less likely to occur. Retrieval practice is a powerful strategy for improving academic performance without more technology, money, or class time.

In this guide, we discuss **how to use retrieval practice to improve learning**. Established by nearly 100 years of research, retrieval practice is a simple learning technique that is easy to implement, with lasting results.

In order to improve learning, we must approach it through a new lens – let's focus not on getting information "in," but on getting information "out."

WHAT IS RETRIEVAL PRACTICE?

Retrieval practice is a strategy in which calling information to mind subsequently enhances and boosts learning. Deliberately recalling information forces us to pull our knowledge "out" and examine what we know. For instance, I might have thought that I knew who the fourth U.S. President was, but I can't be sure unless I try to come up with the answer myself (it was James Madison). Often, we think we've learned some piece of information, but we come to realize we struggle when we try to recall the answer. It's precisely this "struggle" or challenge that improves our memory and learning – by trying to recall information, we exercise or strengthen our memory, and we can also identify gaps in our learning.

You're probably already using retrieval practice.

Sounds like a no-brainer? Probably because you're already using retrieval practice in your classroom! You might ask students questions during class, give quizzes and exams, and/or provide homework as a way to "practice" what was learned – these are all examples of what we call retrieval practice. The big difference, however, is that retrieval should be used as a **learning strategy**, not an assessment tool. In fact, research demonstrates that retrieval is a more potent learning strategy than other techniques commonly used in classrooms, such as lecturing, re-reading, or taking notes. So, instead of asking students to retrieve information only during assessments, encourage retrieval **during learning** to improve students' understanding and retention of classroom material.^[1]

Think of retrieval as a
learning strategy,
not an assessment tool.



WHY DOES RETRIEVAL PRACTICE IMPROVE LEARNING?

Again, when we think about learning, we typically focus on getting information into students' heads. Teachers might lecture, show videos, encourage note taking, and/or provide review sheets. Students often study by re-reading their textbooks, highlighting information, and/or reviewing their notes. In both of these situations, the focus is on getting information "in," with the hope that it sticks. We've all had the experience of feeling like these methods work – if I cram, and re-read, and study my notes, I feel fairly confident that I know the information. And indeed, cramming pays off – we tend to do well on a test. So what's the problem?



Just like exercise, learning
works the same way:
"no pain, no gain."

The problem is that these methods only lead to **short-term learning**. Have you ever asked students about material you covered earlier in the semester, only to find that they've forgotten most everything? This common situation arises because of an assumption we make about memory: when information comes to mind easily and feels "fluent," we've learned successfully. Much to our surprise, however, memory researchers have demonstrated that the **opposite is true**: when information comes to mind easily and feels fluent, it's easy to forget. In other words, just because we learn something quickly and easily does not guarantee we'll remember it.

Challenging learning leads to long-term learning

Retrieval practice makes learning effortful and challenging. Because retrieving information requires mental effort, we often think we are doing poorly if we can't remember something. We may feel like progress is slow, but that's when our best learning takes place. **The more difficult the retrieval practice, the better it is for long-term learning.** For instance, recalling an answer to a science question improves learning to a greater extent than looking up the answer in a textbook. And having to actually recall and write down an answer to a flashcard improves learning more than thinking that you know the answer and flipping the card over prematurely. Struggling to learn – through the act of "practicing" what you know and recalling information – is much more effective than re-reading, taking notes, or listening to lectures. Slower, effortful retrieval leads to long-term learning. In contrast, fast, easy strategies only lead to short-term learning.

DOES RETRIEVAL IMPROVE MORE THAN JUST MEMORIZATION?

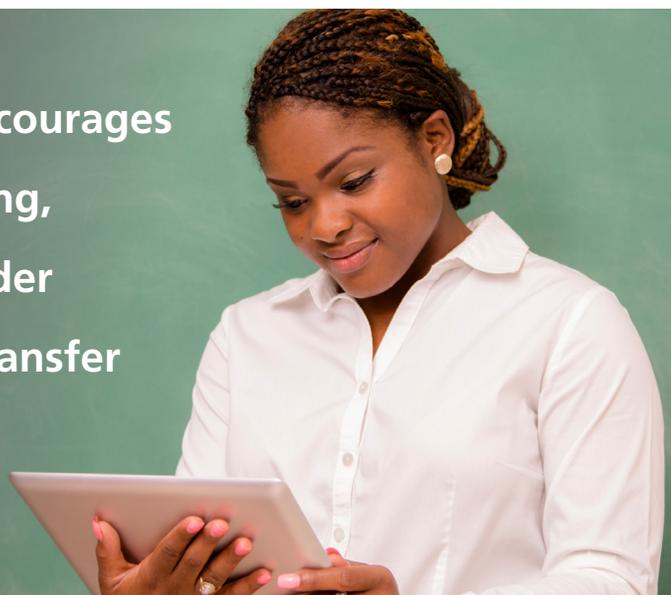
By using retrieval practice as a learning strategy (not an assessment tool!), we exercise and strengthen our memory. Research demonstrates that this improvement in memory and long-term learning is **flexible**, which:

- Improves students' complex thinking and application skills
- Improves students' organization of knowledge
- Improves students' transfer of knowledge to new concepts

In other words, retrieval practice doesn't just lead to memorization – it increases **understanding**. Because students have a better understanding of classroom material by having practiced using this information, students can adapt their knowledge to new situations, novel questions, and related contexts. You can use a variety of question types (fact-based, conceptual, complex or higher order, etc.) to ensure that students are not memorizing, but using information flexibly.^[2]

As an additional benefit, retrieval practice helps us to identify gaps in learning. In other words, not only does retrieval improve learning and help us figure out what we do know – more importantly, it helps us figure out what we don't know. This crucial benefit of retrieval practice is called **metacognition**, or awareness of what students know and don't know. For instance, some students study hard for tests and don't do well, usually because they studied what they already knew – they didn't study what they didn't know. By engaging in retrieval practice, students are able to evaluate what they know and what they don't know, and then make better study decisions. Improved metacognition also benefits teachers: by seeing what students know and don't know, teachers can adjust lesson plans to ensure that all students are on the same page (similar to formative assessment). An important component of metacognition is **feedback**, or providing students information about whether they got something correct or incorrect. Without feedback, students won't know how they performed. Thus, feedback should **always** be provided to students after retrieval practice.

Retrieval practice encourages
flexible understanding,
improving higher order
thinking skills and transfer
of knowledge.



FOR WHICH GRADE LEVELS, SUBJECT AREAS, AND STUDENTS IS RETRIEVAL PRACTICE APPROPRIATE?

All grade levels!

Whether you use retrieval practice with 3rd graders or college students, a great deal of research has shown that retrieval practice is beneficial for all ages (even older adults). It is a straightforward technique that can be applied in a variety of ways, for a variety of ages.

All subject areas!

Research has shown that retrieval practice improves learning of:

- Science
- Mathematics
- Social studies/history
- Vocabulary learning
- Foreign language vocabulary

All students!

Our research demonstrates that retrieval practice benefits both low and high ability students. Because retrieval practice is a simple, flexible learning strategy, it can be adapted to a wide variety of situations, including special education and gifted classrooms. Further, students can practice retrieval at home (e.g., answering practice questions, using flashcards) or in the classroom (e.g., with low-stakes quizzing). In other words, retrieval practice isn't just a teaching strategy; it's a powerful study strategy, too.^[3]

