



MEMORY

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BYU Academic Success Center

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MEMORY

**MEMORY IS SOMETHING YOU DO,
NOT SOMETHING YOU HAVE.¹**

FOLKLORE VS. RESEARCH-BASED STRATEGIES: LEARN WHAT REALLY WORKS

Experimental research in the past 5 – 10 years has shown that many of our most widely and deeply believed ideas about what helps students learn are actually false! For example:

1. We do NOT learn best when the instruction mode is matched to our “personal learning style,” even though that kind of meshing may seem easier or feel more comfortable. We learn best when the process requires more effort, or is more difficult and less comfortable.
2. We often learn best when we use more than one “learning style” or mode: e.g., visual, auditory, and/or kinesthetic.
3. Repeating material you’re trying to remember –e.g., re-reading a chapter or your highlighted parts of it (unless it’s been some time since you read it), can actually cause problems such as:
 - A false sense of “mastery,” or an illusion of knowledge, based on familiarity or fluency with the text.
 - Mere repetition does not teach us how to apply main ideas in a new context, or how the main ideas relate to other examples not included in the text.
 - We gain no sense of the gaps in our knowledge without self-testing.

OUR “STORY-MAKING” BRAINS

“The brain does not store facts, ideas, and experiences like a computer does, as a file that is clicked open, always displaying the identical image. It embeds them in networks of perceptions, facts, and thoughts, slightly different combinations of which bubble up each time....

“Using our memories changes our memories.” [Footnote 2: Carey p. 20]

WHAT IS YOUR MEMORY GOAL?

Strategies for remembering information for longer than a day or two are different from the strategies needed to remember it for a longer period of time. Strategies for rote memorization differ from strategies for learning concepts and knowing how to apply them to new contexts.

Memory systems such as the Peg System, Linking System, and Location Method help “mental athletes” memorize long lists of random numbers or letters and win memory championships, but they are rarely relevant to passing university-level classes. Acronyms can help you memorize a list of words but are similarly not so well-suited to mastering college material.

SO WHAT DOES WORK?

TOP EMPIRICALLY SUPPORTED LEARNING STRATEGIES

1. SPACED LEARNING

“Spaced Study” is studying academic material in multiple sessions, with a day or more in between. There is very extensive research evidence suggesting that our brains need time to “consolidate” information we have learned. For example, after reading or listening to a lecture, especially when we review it and quiz ourselves about it more than once later on, memory traces (or mental representations in long term memory) are strengthened, given meaning, and connected to our prior knowledge & memories.²

You don’t necessarily need to study for a long period of time in each session: your review sessions could be as short as 10 minutes!

This strategy requires some “time management”: see if you can schedule multiple study sessions ahead of exam or quiz dates, with some days in between.

Month of: _____

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—

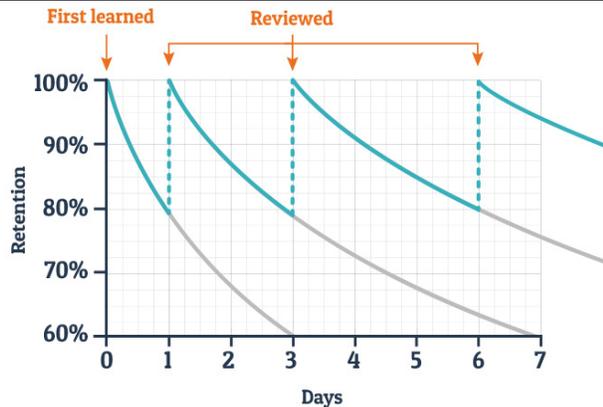
Exam/quiz subject:

Exam/quiz date:

Days I will study:

TOP EMPIRICALLY SUPPORTED LEARNING STRATEGIES

TYPICAL FORGETTING CURVE FOR NEWLY LEARNED INFORMATION³



RETRIEVAL PRACTICE

Long-term retention requires practice re-retrieving information from memory. When we listen to lectures or read & re-read texts we are receiving “input,” but when we take an exam we’re expected to retrieve that input and practice “output.” Also, when we quiz ourselves we discover what we know & don’t yet know.

Examples:

1. Take practice quizzes or tests. Or, create your own quiz: what questions do you think your prof might ask about the material?
2. Teach someone else: explaining a concept to your roommate, or even your water bottle, helps you understand it far more deeply, & identify gaps in your understanding.
3. Create a mind map from memory: create a simple visual representation of the main concepts and how they are related. Then, check your notes or text to see if you have missed any key points.
4. “Cover and Recite”: To review material from a textbook, read a heading while covering up the text below it. Try to recall all the important points made in that section. Then check to see if you missed anything.
5. Preview text chapters before your more careful read.

Ideas and goals for retrieval practice:



LEARNING STYLES AND SENSES

Studying through more than one sensory mode (e.g., visual, auditory, kinesthetic) helps create multiple connections or associations to that material in different parts of the brain. E.g., besides reading a text and listening to lecture about that material, try reciting the important parts out loud, or even—if you’re daring, experiment with dancing or acting or drawing it!

Ideas and goals for learning styles:



SLEEP

There is overwhelming research evidence of the absolutely essential role of sleep in consolidating memories, or moving information into long-term memory. When preparing for an exam, make sure you get adequate sleep the night before (even better, the week before).

TOP EMPIRICALLY SUPPORTED LEARNING STRATEGIES

FOCUSED AND DIFFUSED THINKING MODES

Our understanding of a concept, and our ability to integrate it with other memories (or create multiple associations to it) is enhanced by taking a break after a period of focused studying. E.g., after reading a section of a bio-chem text, take a short break to do a more “diffuse” task, such as unloading the dishwasher, going for a short walk, etc.

INTERLEAVE

“Interleave” different subjects or types of problems when you study. For example: when you’ve been learning how to solve various math problems, study for the exam by mixing up different kinds of practice problems. It’s often more helpful to study more than one subject during a study session than to spend long periods of time (perhaps an hour or more) studying just one subject.

CREATE A STUDY SCHEDULE:

How to:

1. List tasks.
2. Determine priorities.
3. Break large tasks into smaller steps.
4. Plan a schedule with diffuse-mode breaks.

Tasks:

Priorities:

Start time: ____:____ am/pm

I will work for ____ minutes

Subject: _____

My task broken into smaller parts:

End time: ____:____ am/pm

I will take a break by:

For ____ minutes

Start time: ____:____ am/pm

I will work for ____ minutes

Subject: _____

My task broken into smaller parts:

End time: ____:____ am/pm

I will take a break by:

For ____ minutes

Start time: ____:____ am/pm

I will work for ____ minutes

Subject: _____

My task broken into smaller parts:

End time: ____:____ am/pm

STUDY SCHEDULE EXAMPLE

STUDY SCHEDULE EXAMPLE

How to:

1. List tasks.
2. Determine priorities.
3. Break large tasks into smaller steps.
4. Plan a schedule with diffuse-mode breaks.

Tasks:

Neurology chapter 4
Chem. 105 homework
New Testament reading
Study statistics

Priorities:

Neurology chapter 4
New Testament reading

Start time: 8:00 am/pm

I will work for 30 minutes

Subject: Neurology: chapter 4

My task broken into smaller parts:

Preview the whole chapter

Read section on diseases of peripheral nerve

End time: 8:30 am/pm

I will take a break by: Unloading the dishwasher

For 10 minutes

Start time: 8:40 am/pm

I will work for 30 minutes

Subject: New Testament

My task broken into smaller parts:

Read 1 Corinthians 3 – 5

Then read manual for those chapters

Summarize as if I'm teaching it to new convert: out loud!

End time: 9:10 am/pm

I will take a break by: Taking a walk around the block

For 10 minutes

Start time: 9:20 am/pm

I will work for 30 minutes

Subject: Neurology and New Testament

My task broken into smaller parts:

10 min.: "Cover & Recite": diseases of peripheral nerves Ch. 4

5 min. Preview section on diseases of the cranial nerves

10 min. Recite main points from 1 Corinthians 3 - 5

End time: 9:50 am/pm

I will take a break by: Loading the dishwasher

For 10 minutes

Play!!!!!! Ice cream & Tonight Show with spouse

What other memory strategies have helped you in the past?

Which of the above strategies would you like to experiment with further?

NOTES

Sources

- ¹Ellis, D. (2015). *Becoming a master student*. Stamford, CT: Cengage Learning. (p. 101)
- ²Brown, P.C., Roediger, H.L., & McDaniel, M.A. (2014). *Make It Stick: The Science of Successful Learning*. Cambridge, MA: Belknap Press.
- ³Wranx, Chloe. "What is the Ebbinghaus Forgetting Curve?" Wranx Employee Development Blog, blog.wranx.com/ebbinghaus-forgetting-curve.
- ⁴Oakley, B. (2014). *A Mind for Numbers*. New York: Penguin.