

**Learning begins with acquiring knowledge and skills.** Memory enables us to retrieve or recall what has been learned. However, **the most effective learning and memorization strategies are often counterintuitive.** Recent research shows that every time something new is learned, the brain is changed.

### Least Productive Learning Strategies:

**Re-reading** provides only a false sense of mastery and does not result in storing information into long-term memory or the ability to recall information. Although a student may understand the material while reading, this does not ensure the information can be retrieved during a test.

**Easy rapid-fire repetition** of information in short-term memory *without* additional retrieval practice at later point(s) is ineffective.

Attempting to stick to **one learning style** or multiple intelligence limits building additional connections.

**Cramming** leads to faster forgetting.



### Most Productive Learning Strategies:

**Retrieval Practice:** We must access information we have learned. Periodic practice strengthens memory. **Effortful retrieval produces stronger learning and retention.**

- **Flashcards and simple quizzing** right after learning are the most effective. Convert statements into questions to practice retrieving information. Use key concepts and chapter summary questions. **Quiz** yourself to discover what you don't know from memory. Immediate feedback (is the answer correct, why or why not) after the quiz is critical.
- Express information **in your own words**; find additional layers of meaning. Use a metaphor or visual image. Write to learn

**Space out Study Sessions:** Short breaks between sessions provides time for the brain to consolidate and connect new information. Being a little 'rusty' requires more effort to recall the information. This effort strengthens memory.

- New material in a text may need review within a day or so of first reading, then again in a day or two. Once learned, quiz yourself again in a few days or a week. Once mastered, quiz again once a month.
- As you quiz yourself on new material, reach back to retrieve/reload/relearn prior material and see how it relates to the new.



**Interleave:** Alternate the study of two or more subjects to build new connections. Study one subject for 30-45 minutes. Take a 10 -15 minute break. Then study another subject or a different topic in the same subject in the next 30-45 minute session followed by a short break.

Mastery and problem solving requires having knowledge and creativity and/or the conceptual understanding of how to use it.

**Meet with a Success Center Learning Specialist or tutor to learn more specific memorization strategies.**

#### Sources:

Brown, Peter C., Roediger, Mark A., & McDaniel Henry L. *Make it Stick: The Science of Successful Learning*. Cambridge: The Belknap Press of Harvard University Press, 2014.

Ciccarelli, Sandra and White, J. Noland. Image of Three-State Process of Memory. *Psychology*, 4<sup>th</sup> ed., Pearson, 2015.