

Learning in the 21st Century

EFFECTIVE WAYS OF STUDYING



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How do your students study?

- ▶ Reading
- ▶ Highlighting
- ▶ Summarizing
- ▶ Review by re-reading
- ▶ Cramming

Except for reading, these are among the
LEAST effective ways of studying

More effective ways of studying

- ▶ Evidence-based
- ▶ Active
- ▶ Effectiveness: amount retained at exam and later

Spaced practice

- ▶ Spread studying over several days
- ▶ Combine with other techniques

Retrieval practice

- ▶ AKA “Practice Testing”
- ▶ Self-testing, practice quizzes, flash cards...
- ▶ Feedback
- ▶ Builds memory pathways and associations
- ▶ Combine with spaced practice

Retrieval practice + spaced practice

- ▶ Weekly quizzes
- ▶ Mix of old and new topics
- ▶ 50% exam performance improvement

Elaboration

- ▶ Asking questions about material
- ▶ Generating examples
- ▶ Finding associations with other knowledge
- ▶ Explaining one's own reasoning
- ▶ Use with summarizing

Interleaving

- ▶ Mixing subjects or topics in subject
- ▶ Examples
- ▶ Higher test grades for interleaved than blocked
- ▶ More planning needed
- ▶ Least researched of these methods

Sources

All of these topics and more are discussed in

Brown, P, Roediger, H., and McDaniel, M. (2014). *Make it stick: The science of successful learning*. Cambridge, MA: Belknap Press

Spaced practice + retrieval practice (medical students)

Paul, A. (2012, March 7). The new way doctors learn. *Time magazine*. Retrieved from <https://goo.gl/XfFJ5>

Useful resources:

"The Learning Scientists" website, with information for instructors and students. <http://www.learningscientists.org/>

"How to Study: Top Six Effective Strategies" is an 8-minute video available on YouTube. <https://youtu.be/CPxSzxylRCI>