



# SPACED REPETITION



## Spaced Repetition

Typically, students dedicate more and more time to studying as their exam approaches, cramming an entire course material in only a few days or weeks. Does this sound familiar? However, one of the most impactful learning strategies is “spaced repetition” spacing out your studying over several short periods of time over several days and weeks (Newport, 2007).



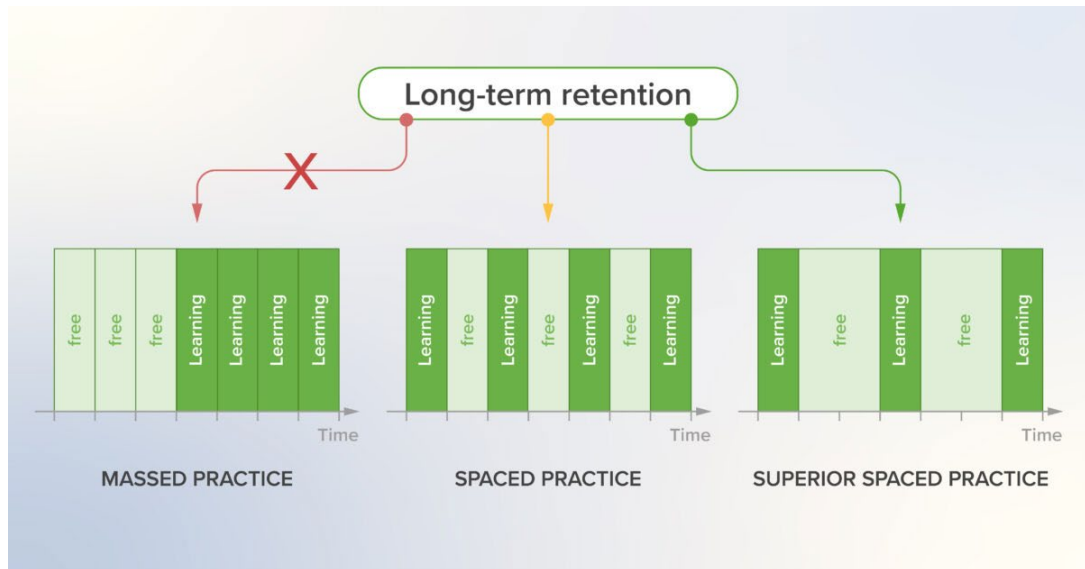
Versteeg et al. (2020) defined spaced learning as follows: “Spaced learning involves (specified) educational encounters that are devoted to the same (specified) material and distributed over a (specified) number of periods separated by a (specified) interstudy interval.”

*Spacing out studying enables better long-term retention of knowledge.*

*Cepeda et al. (2006) reviewed 184 research articles and found that, when learners increased the time between study periods of the same material, their retention level of the material increased.*



The figure below displays that spaced practice with enough interstudy time for forgetting is best for long-term retention.



*Figure 1. Massed Practice, Spaced Practice, Superior Spaced Practice*

Dr. Piotr Wozniak researched the optimal amount of time for spacing out review sessions and he recommended optimal spaced repetition intervals:

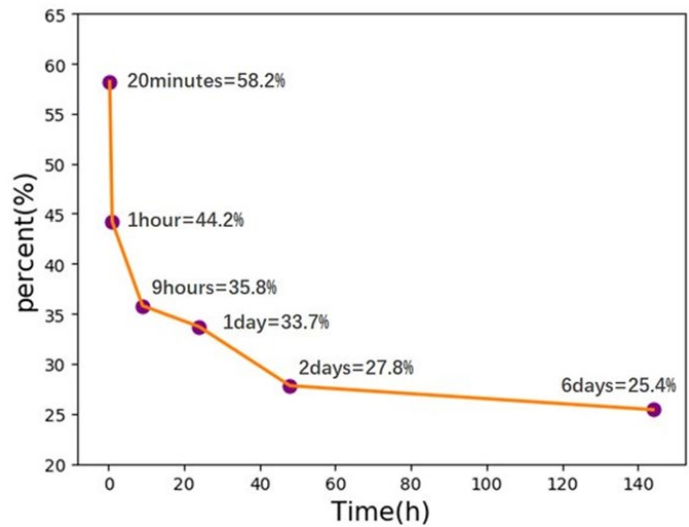
- ✓ 1<sup>st</sup> repetition: 1 day after the initial learning session
- ✓ 2<sup>nd</sup> repetition: 7 days after the initial learning session
- ✓ 3<sup>rd</sup> repetition: 16 days after the initial learning session
- ✓ 4<sup>th</sup> repetition: 35 days after the initial learning session

But you don't have to strictly follow this interval. The best spaced repetition time interval still varies from learner to learner.



## What's the science behind spaced repetition?

Dr. Hermann Ebbinghaus (1885) showed that forgetting begins immediately after learning, when 20 minutes have passed, only 58.2% of memory remains. After 1 day, about 34% and after 6 days, about 25% of memory remains.



According to Voice and Stirton (2020), learners who use spaced repetition had the highest exam score of 70% compared to the other groups of students in the study, which proves that learners who apply spaced repetition to their studies have the best test results.



**Avoid:** Leaving too long or too short a gap between revisiting sessions.

**Do:** Revisit your notes just before you forget it.



## References

Cepeda, N. J., Pashler, H., Vul, E., Wixted, J. T., & Rohrer, D. (2006). Distributed practice in verbal recall tasks: A review and quantitative synthesis. *Psychological bulletin*, 132(3), 354.

Ebbinghaus, H. (1885). 'Memory: A contribution to experimental psychology,' New York: Dover.

Newport, C. (2006). How to become a straight-a student: the unconventional strategies real college students use to score high while studying less. *Three Rivers Press*.

Versteeg, M., Hendriks, R. A., Thomas, A., Ommering, B. W., & Steendijk, P. (2020). Conceptualising spaced learning in health professions education: a scoping review. *Medical education*, 54(3), 205-216.

Voice, A., & Stirton, A. (2020). Spaced Repetition: Towards More Effective Learning in STEM. *New Directions in the Teaching of Physical Sciences*, 15(1), n1.

Spaced Repetition: How to Make Your Training Unforgettable.

<https://www.edapp.com/blog/how-spaced-repetition-works/>

How to Apply Spaced Practice to Make Learning in Medicine More Durable

<https://www.lecturio.com/pulse/how-to-apply-spaced-practice-to-make-learning-in-medicine-more-durable/>



## Further Readings and Resources

- [Studying 101: Study Smarter Not Harder. The Learning Center. University of North Carolina at Chapel Hill.](#)
- [Spaced repetition in learning theory.](#)