Spaced Practice, Retrieval and the Forgetting Curve

Memory fades fast after you learn something. Pulling it back out on purpose, spread across days, is the most reliable way to make it stick.

AFTER THIS GUIDE YOU CAN

- Describe the forgetting curve.
- Explain why retrieval practice beats rereading.
- Build a spaced review plan for an exam.
- Use interleaving and sleep to strengthen memory.

Key terms

Forgetting curve	The pattern, first described by Hermann Ebbinghaus, where memory drops quickly after learning and then levels off.
Retrieval practice	Pulling information out of memory, as in self quizzing or flashcards, instead of looking at it again.
Testing effect	The finding that practice tests improve later recall more than the same time spent rereading.
Spaced practice	Spreading study sessions over days, with gaps between them.
Massed practice	Cramming: one long session right before the test. It feels productive but fades fast.
Interleaving	Mixing different topics or problem types in one session so you practice choosing the right method.
Illusion of fluency	Feeling that you know material because it looks familiar on the page.
Elaboration	Explaining how and why an idea works and linking it to what you already know.
Memory consolidation	The process, much of it during sleep, that stabilizes new memories.
Desirable difficulty	Effort that feels harder during study but leads to stronger long term memory.

The big ideas

- Each time you successfully pull a memory back out, the next drop is slower.
- Quiz yourself, then check. Checking right away fixes errors before they set in.
- Space it out: a little each day beats one long session, even with the same total hours.
- Rereading and highlighting feel good but mostly build familiarity, not recall.
- Mix topics in practice so you learn when to use each method, not only how.
- Sleep is part of studying. An all nighter trades the consolidation you need for hours you cannot use well.

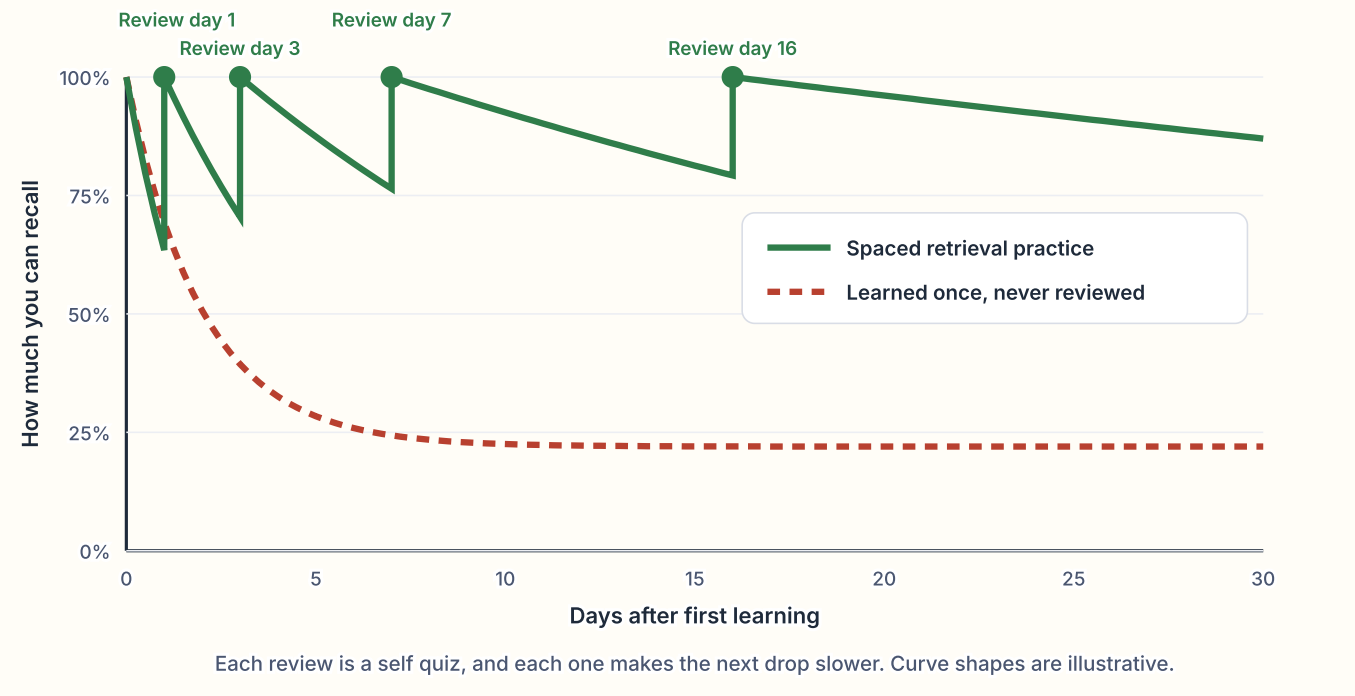

Figure. The forgetting curve with spaced reviews.

Worked example

Week 8 in the Learning Commons. Midterms in Biology, Math and Psychology are all on Monday. You have six days and three study slots a day. Jun suggests quizzing each other daily. Rowan plans an all nighter.

1. Day 1: a short self quiz in each subject to find weak spots.
2. Days 2 to 4: rotate subjects every slot. Start each session with five minutes of recall before opening notes.
3. Day 5: a mixed practice test across all three subjects. Fix every miss.
4. Day 6: light review of the misses and a normal bedtime.
5. Result: each subject gets five or six spaced retrieval sessions. Rowan's single night gives one, on no sleep.

Common mistakes

- Rereading notes until they look familiar and calling it studying.
- Studying one subject only, until the night before its exam.
- Checking the answer before really trying to recall it.
- Pulling an all nighter before the test.
- Practicing only the topics you already know well.

Check yourself

1. What does the forgetting curve show?
2. Why does self quizzing beat rereading?
3. Same six hours: one night or six one hour sessions. Which works better?
4. What is interleaving?
5. What is the illusion of fluency?
6. Why is sleep important before an exam?
7. After a self quiz, what should you do right away?
8. Name one desirable difficulty.

Answer key

1. **Memory drops fast after learning, then levels off.** Without review, much is lost within days.
2. **Pulling information out of memory strengthens it.** Rereading mostly builds familiarity.
3. **Six spaced sessions.** Spacing gives more retrievals and more sleep between them.
4. **Mixing topics or problem types in one session.** You practice choosing the right approach.
5. **Mistaking familiarity for real knowledge.** The page looks known, but you cannot recall it cold.
6. **Sleep helps consolidate memories.** It also protects attention on test day.
7. **Check your answers and fix errors.** Feedback stops mistakes from setting in.
8. **Any one: self quizzing, spacing, interleaving.** They feel harder now but work better later.

Help is real. If you or a friend are struggling, talk to your campus counseling center. In the United States you can call or text 988 (Suicide and Crisis Lifeline) any time. Outside the US, contact your local crisis line.

First Semester by Dr. Akash Garg, Dr. Garg Learning. CC BY-NC-SA 4.0. Ridgeline College and every character are fictional. Policies on grading, late work, AI use and financial aid differ by school; always check your own syllabus and aid office.