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OverviewSpaced repetition is one of the most effective methods to study and ace examinations. It has been used by several notable people such as Ali Abdaal to help them learn and remember content effectively and for the longest period of time without naturally forgetting about them. Every human has their own forgetting curves, where they tend to forget information about a certain topic over time. The way we can take advantage of the forgetting curve is by breaking the cycle by reviewing learning material at spaced intervals. The more that we practice and the more spaced this repetition becomes, the more likely we are to encode this information into our long-term memory. In essence, the idea behind spaced repetition is that you allow your brain to forget some of the information to ensure that the active recall process is mentally taxing. The psychology literature suggests that the harder that your brain has to work to retrieve information, the more likely the information will be encoded in your brain. We have embedded this concept into a simple yet outstanding template pack that allows students and anyone who is learning to add individual spaced repetition schedules for each subject and their respective topics. You will be able to track progress with learning all your subjects and modules and view upcoming study dates in a calendar. Tags within the template allow you to learn to the next level with this custom-built spaced repetition template for Notion! Whether you're studying for exams, picking up a new language, or mastering complex concepts, this template helps you retain information efficiently. Designed for ease of use, it schedules reviews at optimal intervals, making it perfect for busy learners and students. Transform your Notion workspace into a powerful study tool and watch your retention soar! Trying to make it yourself? I made a Youtube video just for that! Check it out down below. Is spaced repetition? Spaced repetition is a learning technique that helps improve long-term memory retention. It involves reviewing information at increasing intervals over time, rather than cramming it in one session. Here's how it works: Retention intervals: You review new information immediately, then after gradually longer periods (like 1 day, 3 days, a week, etc.). Forgetting curve: This system combats the brain's natural "forgetting curve," ensuring that information is reviewed just before it's likely to be forgotten. Flashcards or digital tools: Commonly used with flashcards or spaced repetition apps, like Anki or Notion templates, that help schedule review sessions automatically. Name a fair price: I want this! You'll get a mini spaced repetition system for you! Notion! Copy product URL Powered by Every step of the training journey, all in one place Assess and track your team's understanding in any digital or in-person training. So you can be sure your teams are doing their tasks correctly. Onboard new team members Take them through digital training Assess their knowledge on the job Track their performance Certify your team Build your own course in real-time. Choose from 80+ templates and enhance your learning with video, quizzes, games, assessments, and more. No coding or graphic designer required. Manage who can see, edit, and publish learning content. Enhance it with engagement features and integrations. And watch completion rates soar in analytics. Get up and running fast with our solutions Tailored solutions designed to fit your business goals and objectives. Transform SOPs into scalable training to boost productivity and prevent errors and delays. Provide new hires with vital information to feel productive and valued from Day 1 Automate compliance training to reduce risk and gain control over your team's compliance. Provide teams with essential product training to exceed customer expectations. Engage your team and hit training goals faster. Deliver highly-targeted microlearning courses directly to their device. So your team can do their training anytime, anywhere. Launch faster with up to 5 lessons built for you every month. Simply send us what you have, and our expert instructional designers will turn it into impactful, bite-sized content. If you've asked yourself, "Does spaced repetition (aka distributed practice) really work or is it just a lot of hype?", welcome. This article will give you a short, highly interesting timeline of the evidence which supports this learning tool. It all began in 1939! Herbert J. Spitzer investigated what effect the spacing of material and tests had on recall and retention. Although his results showed promise, they were not really dealt with by others for more than a generation. Jumping to 1989: Overwhelming evidence that spaced repetition works Frank N. Dempster published a review of the scholarly literature in the Educational Psychology Review. His conclusion was the weight of evidence showed that spaced repetition is a "highly effective means of promoting learning [over a] variety of settings and across many different types of materials and procedures." 1991: Spaced repetition is effective with learners of all ages! A research team at Villanova University, USA ran a two-part, spaced learning experiment. Part I was on young children (preschoolers, first graders, and third graders). They found that recall increased as the "spacing between repetitions increased". However, the effect did not relate to age. In other words, age was not a factor, just the spacing between the repetitions. In Part II of their study, this team conducted a spaced learning experiment using college students. The results were the same. Their conclusion? "Spaced-repetition effects in recognition are produced by fundamental memory mechanisms that are operational at a very early age and which undergo little change with development." In plainer English, spaced repetition (or distributed practice) increases recall for anyone at any age moving on to 2016: Distorted practice can save your money According to researcher Sean Kang (Dartmouth University, USA), organizations should capitalize on spaced repetition. Kang states that spaced practice "can be a core effective approach." This is due to the fact that greater retention of material is achieved in the same amount of time. As a result, learners spend less time relearning forgotten material, "leaving more time for other productive learning activities." Overall, distributed practice "enhances the efficacy (effectiveness) and efficiency of learning." 2017: Effects of spaced repetition age and goal dependent While distributed practice works for everyone, the results depend on how old the person is and which task they are being taught. Christopher D. Smith and Damian Scarf (University of Otago, New Zealand) found that for adults, spaced repetition is more effective for teaching skills rather than language. Having said that, this educational technique improves the generalization of learning for all ages. 2019: Findings about why spaced repetition works A team of researchers at Beijing Normal University in China used scalp EEG data to get a picture of the biological basis for the effectiveness of spaced repetition. The team analyzed the scalp EEG data using spatiotemporal pattern similarity (STPS). Spatiotemporal data analysis looks at information in a particular location (spatial) over a defined period of time (temporal). Using powerful computing processors, large quantities of data can be analyzed in this way to reveal patterns. The research data showed that "greater item-specific STPS in the right frontal electrodes at 543-727 ms after stimulus onset was associated with better memory performance. More importantly, this STPS was larger under the spaced-learning condition than the massed-learning condition." In plainer English, during learning, electrical activity happens in the brain. This study found significant activity in the right frontal part of the brain, 543-727 milliseconds after the learning period began. This activity caused better retention of material, and spaced repetition increased the intensity of this activity. 2020: Data showing how effective spaced repetition can be British researchers at the University of Leicester wanted to investigate the quantitative effect of distributed practice. They constructed a custom-built web app. The app could personalize a repetition schedule for study materials about physics for college students. Students could request spaced repetition times for a massed repetition timeable, not use the app at all, or use the app at a massed repetition time. The researchers found that spaced repetition was an adjusted mean exam score of 70%. Those who used massed practice had an adjusted mean exam score of 64%. Students who did not use the app at all had an adjusted mean exam score of 61%. The study showed that learners who studied via spaced repetition had the best test results. Overall, "Spaced repetition (or distributed practice) is a time-tested educational tool, supported by over 80 years of research data. Since it increases learner retention over the same amount of study time as massed practice, distributed practice is a budget-friendly option. It works for learners of all ages. For adults, it is better suited to skills training than language learning. As researchers investigate this tool further, they find that it causes neurological (brain) activity which enhances learning. SC Training (formerly EdApp) has taken spaced repetition for organizations to the next level with their feature: Brain Boost (by request only). Based on the principles of spaced repetition, this spaced repetition app relies on an adaptive, dynamic algorithm that automatically creates interactive lessons based on core, previously learned content in any given SC Training (formerly EdApp) lesson. Get started enjoying the benefits of spaced learning for your organization training and sign up for SC Training (formerly EdApp)'s enterprise plan today! Sources: If you keep hoping that you'll remember what you learned, I'll help you to reduce the struggle with this article today. You might be familiar with the concept of spaced repetition and already serious about improving your studying. After having mastered 3000 Chinese characters (and more different stuff) using spaced repetition, one of the questions I get most often is: what are the optimal intervals to review flashcards? In this article, we'll explore both the power and the limitations of spaced repetition, and will find out if there is an optimal review schedule. If that's the case, we'll see how to incorporate it into our study. Let's dive in and discover how spaced repetition can take your learning to the next level. Spaced repetition is a learning technique that involves strategically spacing out your study sessions to enhance long-term memory retention. Instead of cramming large volumes of information in a short period, this method breaks down your learning into smaller, manageable chunks that are revisited at increasingly increasing intervals. Spaced repetition promises an automated, science-backed system that lets you remember anything you want. This study method has steadily become more popular over the past years, with over 67% of students using flashcards right now - according to this study. The rise of spaced repetition: interest in "Spaced repetition" on Google Trends over the past 5 years Personally, I first came across spaced repetition way after college when learning Chinese characters. Suddenly, I had a system for my review practice. And it showed me what I needed to learn at the optimal time! Spaced repetition capitalizes on your brain's natural memory processes, making it an invaluable tool for people like medical students who are grappling with vast amounts of complex material. But how does it work exactly? At the core of spaced repetition lies the concept of the "forgetting curve", which describes the exponential decline in retention after first learning new information. Unlike what many articles will tell you, neither spaced repetition nor the forgetting curve were discovered by German psychologist Hermann Ebbinghaus. In fact, his original research paper describes how he memorized meaningless series of syllables with hundreds of repetitions - which is counter to the principle of spaced repetition, which is all about remembering useful information with the smallest number of repetitions. As you can read in my Guide to using Spaced Repetition to Master not Memorize, spaced repetition, and the forgetting curve as we know it, were invented by Piotr Wozniak in 1985, exactly one hundred years after Ebbinghaus' research. Piotr Wozniak's forgetting curve: the forgetting curve as we usually know it! The forgetting curve illustrates that memory retention declines rapidly in the initial days after learning, but the rate of decline slows down as time goes on. Storage Strength vs Retrieval Strength Fun fact: forgetting can actually improve your learning. The "Forget to Learn" theory suggests that our brains store memories with two strengths: storage strength, which remains steady, and retrieval strength, which fades over time. Interestingly, when retrieval strength drops, learning increases when we access the memory again. This idea, called desirable difficulty, is a good mix of new and old learning material. Obsessing about the optimal schedule could be a misplaced effort for you, knowing that we can expect benefits at an order of just around 3%. By looking at the most popular spaced repetition systems and apps (explored in more detail below), we can find a schedule that will do great in most cases. You can use this schedule as your template for spaced repetition: Day 1: First repetition within 24 hours Day 6: Second repetition in about one week Day 14: Third repetition in about one week Day 30: Fourth repetition in about two weeks Day 60: Fifth repetition in about five months Day 130: Sixth repetition in about five months Day 360: Seventh repetition in about a year? Repetitions usually suffice to remember information for life. Also notice that after the second repetition, the next interval can be calculated by multiplying the previous interval with a factor of around 2.2. This number is called the ease factor, and depending on your implementation, it is usually set between 2 and 2.5. But how can you tailor your schedule to constraints like exams or papers? To reduce your anxiety and maximize your performance around exams, here are some handy tricks: Prioritize high-yield material: When preparing for an exam, it's essential to focus on the most critical topics and concepts that are likely to appear on the test. Identify high-yield material and prioritize it in your spaced repetition schedule. This approach ensures that you dedicate more time and effort to the material that will have the most significant impact on your exam performance. Adjust intervals for shorter timeframes: With an exam on the horizon, you'll need to modify the intervals between your study sessions to account for the limited time available. While maintaining the principle of gradually increasing intervals, you may need to shorten the time between reviews to ensure you can cover all the essential material. For example, you might start with intervals of a few hours, then progress to daily reviews and finally, every few days as the exam approaches. Incorporate practice questions: As you adjust your spaced repetition schedule for an upcoming exam, make sure to simulate practice questions in your study sessions. They will help reinforce your understanding of the material and allow you to apply your knowledge in exam-like conditions. I also recommend you use these questions independent of exams, as this both digitally or in the analog world: The Leitner System is a popular straight-forward spaced repetition technique developed by German scientist Sebastian Leitner in the 1970s. This system uses flashcards and a series of labeled boxes to help learners effectively plan, consolidate, and review information. Here's a closer look at how the Leitner System works: Setting up the Leitner System: Create flashcards with questions or concepts on one side and answers or explanations on the other. Label a series of boxes (or use a flashcard app with a built-in Leitner System algorithm) with numbers representing review intervals (e.g., Box 1 for daily review, Box 2 for three-day intervals, Box 3 for weekly intervals, etc.). How to use the Leitner System: Start by placing all flashcards in Box 1. Review the cards in Box 1. When you answer a card correctly, move it to the next box (e.g., from Box 1 to Box 2). If you answer a card incorrectly, it moves back to Box 1 (alternatively, you can just move it one box lower). Continue reviewing cards in each box according to their designated intervals. The cards in higher-numbered boxes will be reviewed less frequently, while those in lower-numbered boxes will require more regular reviews. Regularly assess your progress and adjust the intervals or number of boxes as needed to suit your learning preferences and goals. The benefit of the Leitner System is that it provides a structured, easy-to-understand approach to implementing spaced repetition, making it an excellent starting point for students new to this learning technique. But its main limitation is the fact that it's hard to connect it with your other study materials and methods, which nowadays mostly live digitally. So let's also look at some digital apps you can use for your spaced repetition practice. In this section, we'll introduce you to the best spaced repetition apps that utilize modern algorithms to optimize your study sessions. This is the field pioneered by SuperMemo, who created the popular SM-2 algorithm that has set the standard for many other spaced repetition apps. SuperMemo, a pioneering spaced repetition software, now struggles with an outdated user interface and limited device compatibility. Developed in 1987 by Piotr Wozniak, it introduced the popular SM-2 algorithm. Nowadays, the app's design feels archaic, making navigation frustrating and time-consuming. Additionally, SuperMemo lacks seamless integration with XLSX and Google Sheets. Effortless data organization Visual graphs and progress reports Automatic updates for spaced repetition scheduling Template is fully adjustable and user-friendly Sample file available for immediate download Instructions 1. Input flashcard data. Add the subject, question, answer details. 2. Determine review intervals: Specify the frequency and timing for your spaced repetition. 3. Track study sessions: Log your sessions and monitor your progress efficiently. 4. Real-time progress updates: Analyze your learning curve with dynamic visualizations. 5. Review past performance: Access historical data to improve your study techniques. 6. Generate insightful reports: Create summaries and charts to enhance your learning experience. Explore 6 predefined templates for Spaced Repetition, meticulously crafted to enhance your learning efficiency. Each template comes with distinct features to help you optimize your study habits and maximize information retention: Spaced Repetition Excel Templates 1 - Open 2 - Open 3 - Open 4 - Open 5 - Open 6 - Open Explore additional templates to enhance your spaced repetition studies: I'll just say what we're all thinking: studying takes too much time. There are only 24 hours in a day, and naturally you'd like to use as many of them as possible for sleeping and, I don't know, drawing pictures of robot bears or something. To achieve that goal, you need to find a method that lets you spend less time studying while retaining the same amount of information. Here's the solution: space out your studying. By introducing time intervals between study sessions, you can remember more - even if you spend fewer actual hours studying. This is called spaced repetition, and it may be the most powerful technique in existence for improving your brain's ability to recall what you study. Today we're going to dig into why it's so powerful, and I'm going to show you how you can use it - both with paper flashcards and with apps. I'll also show you the time intervals that have been scientifically proven to help you remember the most information. But first, let's look at the history behind this technique. Spaced repetition leverages a memory phenomenon called the spacing effect, which describes how our brains learn more effectively when we space out our learning over time. Here's how Pierce J. Howard, the author of my least favorite book to haul into coffee shops - "The Owner's Manual for the Brain" - explains it: "Work involving higher mental functions, such as analysis and synthesis, needs to be spaced out to allow new neural connections to solidify. New learning during the day erodes old learning from the previous day, and the only way to counteract this is by scheduling more frequent reviews." In conclusion, spaced repetition is a valuable tool to optimize your learning process, but it's not a complete solution on its own. Prioritizing understanding and optimizing for memory are key elements in achieving success with spaced repetition. By utilizing active recall, spaced repetition, and varied retrieval practice, you can optimize your learning sessions. The optimal spaced repetition schedule may not matter as much as the effort you put into understanding and encoding the information properly. If you're ready to take your studying to the next level, give Traverse a try by going here. You'll have everything you need to encode what you're learning and use spaced repetition along with it, in the same app. Especially if you don't believe that learning can be fun, let Traverse change your mind. This depends on how long you wish to retain the information for. Dr. Piotr Wozniak researched the optimal amount of time for spacing out review sessions and developed the first computer algorithm for spaced repetition, called SuperMemo. Below are his recommended optimal spaced repetition intervals: 1st repetition: 1 day after the initial learning session, 2nd repetition: 7 days after the initial learning session, 3rd repetition: 16 days after the initial learning session, 4th repetition: 35 days after the initial learning session. Last updated 55 years ago Terms and Conditions Submit your template to the Notion template gallery, get featured, and even get paid - all in just a few clicks! Get started Spaced Repetition Excel Template is available in XLSX format as well as in Google Sheets. This template enables you to efficiently manage your learning schedule using spaced repetition techniques, allowing for personalized study plans and progression tracking. You can download the file as an Excel template or access it conveniently through Google Sheets from anywhere. Open Features Comprehensive tracking for spaced repetition study sessions Automatic calculation of review intervals Precise management of learning progress Insights by subject and review dates Exportable formats: XLSX and Google Sheets Effortless data organization Visual graphs and progress reports Automatic updates for spaced repetition scheduling Template is fully adjustable and user-friendly Sample file available for immediate download Instructions 1. Input flashcard data. Add the subject, question, answer details. 2. Determine review intervals: Specify the frequency and timing for your spaced repetition. 3. Track study sessions: Log your sessions and monitor your progress efficiently. 4. Real-time progress updates: Analyze your learning curve with dynamic visualizations. 5. Review past performance: Access historical data to improve your study techniques. 6. Generate insightful reports: Create summaries and charts to enhance your learning experience. Explore 6 predefined templates for Spaced Repetition, meticulously crafted to enhance your learning efficiency. Each template comes with distinct features to help you optimize your study habits and maximize information retention: Spaced Repetition Excel Templates 1 - Open 2 - Open 3 - Open 4 - Open 5 - Open 6 - Open Explore additional templates to enhance your spaced repetition studies: I'll just say what we're all thinking: studying takes too much time. There are only 24 hours in a day, and naturally you'd like to use as many of them as possible for sleeping and, I don't know, drawing pictures of robot bears or something. To achieve that goal, you need to find a method that lets you spend less time studying while retaining the same amount of information. Here's the solution: space out your studying. By introducing time intervals between study sessions, you can remember more - even if you spend fewer actual hours studying. This is called spaced repetition, and it may be the most powerful technique in existence for improving your brain's ability to recall what you study. Today we're going to dig into why it's so powerful, and I'm going to show you how you can use it - both with paper flashcards and with apps. I'll also show you the time intervals that have been scientifically proven to help you remember the most information. But first, let's look at the history behind this technique. Spaced repetition leverages a memory phenomenon called the spacing effect, which describes how our brains learn more effectively when we space out our learning over time. Here's how Pierce J. Howard, the author of my least favorite book to haul into coffee shops - "The Owner's Manual for the Brain" - explains it: "Work involving higher mental functions, such as analysis and synthesis, needs to be spaced out to allow new neural connections to solidify. New learning during the day erodes old learning from the previous day, and the only way to counteract this is by scheduling more frequent reviews." In conclusion, spaced repetition is a valuable tool to optimize your learning process, but it's not a complete solution on its own. Prioritizing understanding and optimizing for memory are key elements in achieving success with spaced repetition. By utilizing active recall, spaced repetition, and varied retrieval practice, you can optimize your learning sessions. The optimal spaced repetition schedule may not matter as much as the effort you put into understanding and encoding the information properly. If you're ready to take your studying to the next level, give Traverse a try by going here. You'll have everything you need to encode what you're learning and use spaced repetition along with it, in the same app. Especially if you don't believe that learning can be fun, let Traverse change your mind. This depends on how long you wish to retain the information for. Dr. Piotr Wozniak researched the optimal amount of time for spacing out review sessions and developed the first computer algorithm for spaced repetition, called SuperMemo. Below are his recommended optimal spaced repetition intervals: 1st repetition: 1 day after the initial learning session, 2nd repetition: 7 days after the initial learning session, 3rd repetition: 16 days after the initial learning session, 4th repetition: 35 days after the initial learning session. Below is a free download link to an adaptive study planner template for use in Google Sheets, along with instructions on how to use it. This adaptive study planner template helps you effectively schedule and manage your study sessions for each chapter. First, enter the initial study date of a chapter. Then, input your spaced repetition intervals for the second, third, and subsequent revisions of that chapter. In another column, enter the actual completion date. With each completion date, the next revision date will be calculated automatically. Continue this process with other chapters. The number of revisions needed to effectively memorize a chapter can vary depending on the complexity of the material and individual learning styles. You are free to modify the spaced repetition intervals to suit your needs, and I'll explain how to do that as well. Download the Adaptive Study Planner Template Spaced repetition refers to the interval after which you should revise a chapter. 1 = After 1 day 2 = After 2 days ... n = After n days You can find these spaced repetition intervals in the range D2:M2, and their corresponding serial numbers in D1:M1. You can modify the intervals in D2:M2 to suit your needs. We will use the serial numbers as the input with the same template, if you want to skip a revision after 15 days, then the serial number is 15. Note: The template uses the serial number to add more spaced repetition intervals to the chapter. You can add more chapters if needed, which I'll explain as well. Planning the Study of the First Chapter: In the third column, enter the initial study date for the chapter in the dark yellow highlighted cell (e.g., cell D6). In cell B7, highlighted in dark yellow, enter the serial number corresponding to your desired spaced repetition interval. For example, if you want to revise the chapter after 45 days, enter 9. In cells B8, B9, B10, etc., enter the serial numbers for the third, fourth, fifth, and subsequent spaced repetitions. You will get the second revision date in C7. Enter it in D7 to get the next completion date in C8. Enter it in D8, and continue this process until you have completed all the revision dates. You can follow the same steps for the other chapters. Important: When you complete a revision according to the schedule, you do not need to make any changes. However, if any revision completion date in column D differs from the schedule in column C, update the date in column D. Then, adjust the dates of subsequent revision completions in column D based on the refreshed dates in column C. Note: Do not make any changes to the second column in each chapter, as it is dedicated to formulas. These formulas help automatically reschedule the study planner. The template currently supports 6 chapters. If you want to add a 7th chapter: Copy the range Q4:S22. Navigate to cell T4 and paste the copied range. Delete any contents in the first and last columns. The template currently supports up to 15 revisions. If you want to add a 16th revision: Select row #20, right-click, and select "Insert 1 Row Below." You can skip this part as it only covers the formulas and a brief explanation. Under each chapter, the first and second cells in the second column contain formulas. Chapter 1 Formula: #1 (Cell C6): =D6 This formula is a cell C6 copies the initial study date. You won't see this result in cell C6 since the font color matches the background. The following formula in cell C7 uses this value. Chapter 1 Formula: #2 (Cell C7): =ArrayFormula(LET(r first, C6, test, IFNA(MAP(r first, C6, SEQUENCE(ROWS(r first), 1, 1)+XLOOKUP(va1a, reptID, rept) )), IF(test>15, test,"")) ) Where: #D2S:MS2 = The spaced repetition intervals. #D\$1:\$M\$1 = The serial numbers of the spaced repetition intervals. #B7:\$B21 = The user-entered spaced repetition intervals. #C6 = The reference containing the initial study date entry copied from cell D6. Formula Explanation: OFFSET(rev first, valB-1, 1): This formula in cell C7 offsets 0 rows and 1 column from C6 to get the date from D6. XLOOKUP(va1a, reptID, rept): Returns the spaced repetition interval based on the user input in B7. The formula adds the XLOOKUP output to the OFFSET output to calculate the next revision date in C7. Since this formula is used as a custom function with MAP LAMBDA, it repeats in each row. The OFFSET formula increments the row number (0, 1, ...) while the XLOOKUP searches for the current row element in column B within the spaced repetition serial numbers and retrieves the corresponding spaced repetition interval.