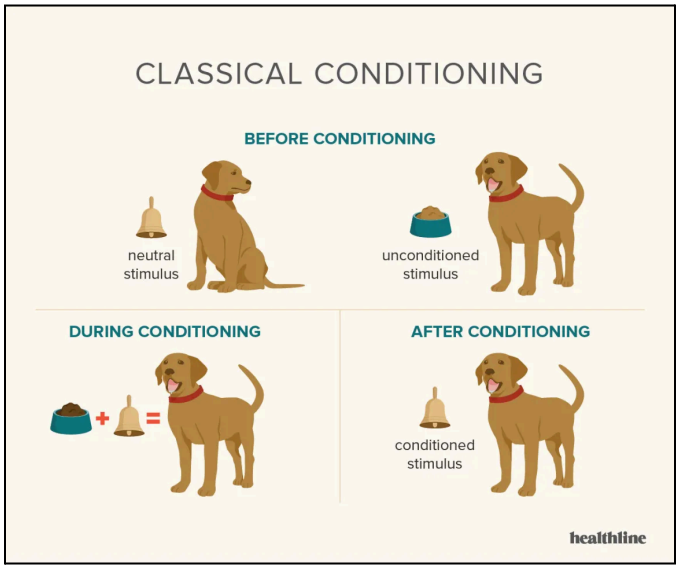
``Academic Wellbeing presents. . .

Study & Note-Taking Strategies

Application and Example-Based Strategies

Concrete Examples

In order to help with understanding and recalling information, concrete examples can be paired with term definitions. First, create a declarative definition (a short one or two sentence explanation of a concept). Then, write down an example of the definition. Pairing a concrete example with an abstract concept allows students to understand concepts better. See format below:



Term: Classical Conditioning - first studied by Ivan Pavlov, classical conditioning is a learning process that occurs when two stimuli are repeatedly paired: a response which is at first elicited by the second stimulus is eventually elicited by the first stimulus alone.

Concrete Example: Dog salivating to Bell

Memorization and Recall Study Strategies

Active Recall Techniques

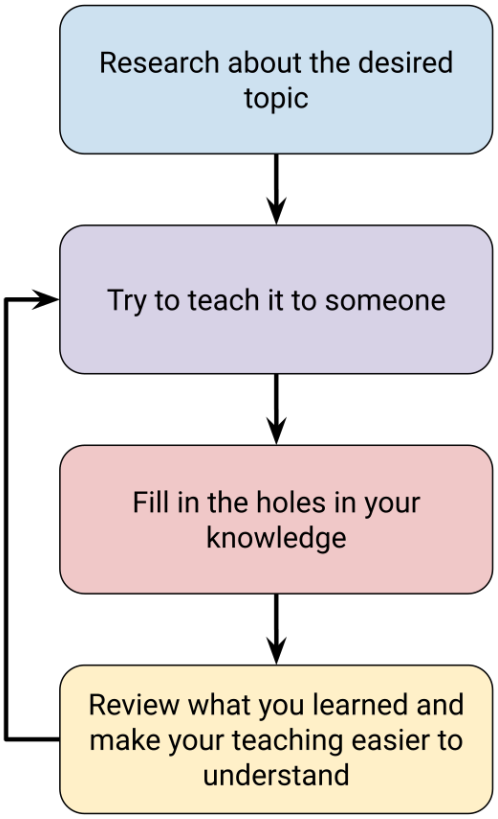
Active Recall Techniques encourage the brain to move information from short-term memory into long-term memory. This allows students to have better recall of information when taking exams or participating in class discussions. The following are common active recall techniques:

1. Flashcards
2. Write Questions While Taking Notes
3. Complete Study or Reading Questions
4. Practice Tests
5. Visual Aids
6. “Teach a Friend”

Elaboration (the Feynman Technique)

An easy technique to pinpoint gaps in knowledge. Students a

1. Select a topic
2. Practice recall - write down everything you know about a topic. Then in simple language, practice teaching the content to someone else or outloud to yourself.
3. Identify gaps in understanding - review what you remembered and identify gaps in material and understanding. Return to the textbook or lecture notes to clarify and fill in these gaps. Write down any corrections or elaborations.
4. Simplify language - make sure that all your language is simplified for ease of recall during future repetitions
5. Repeat process as needed

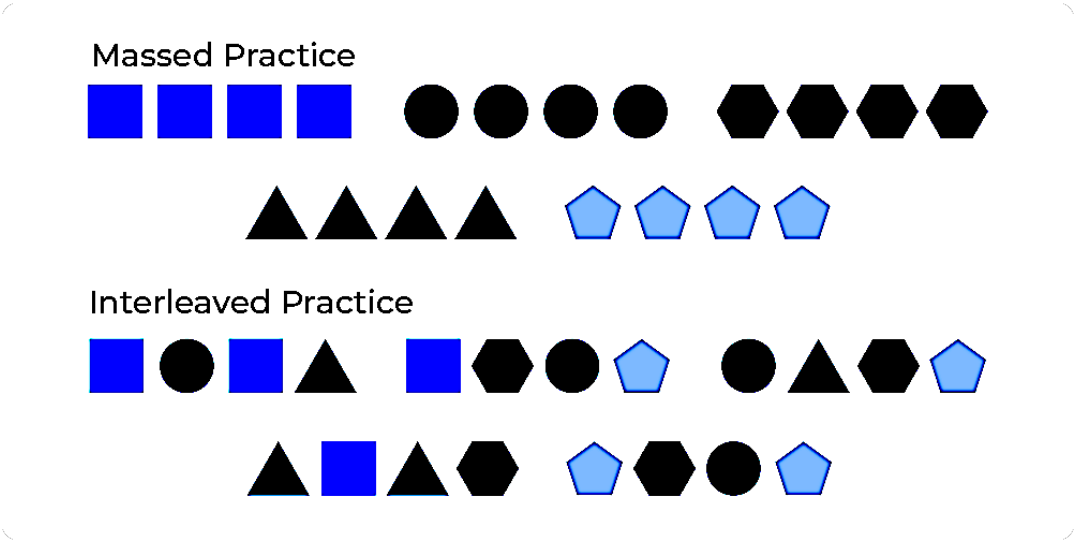


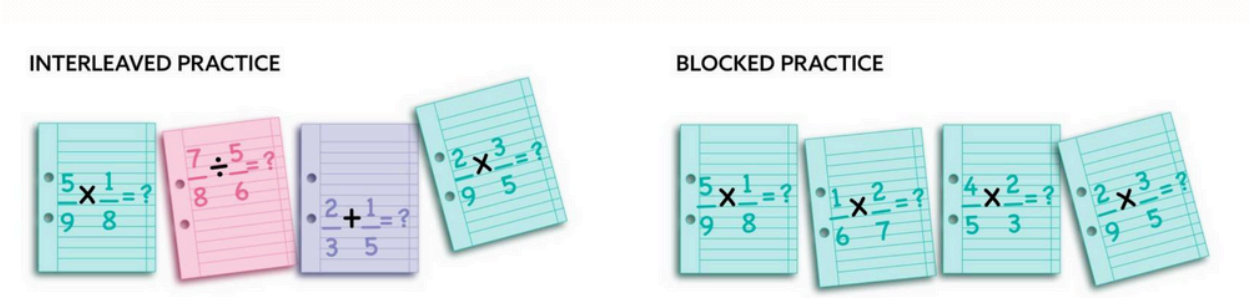
Interleaving

While studying a chosen subject, students alternate the types of practice problems and questions they solve or answer. Interleaving allows students to attend more to the individual concepts and decrease fatigue. Additionally, interleaving helps students build retention of understanding and promotes mastery of content long-term.

Studying the same concept for an extended period, or massed practice, can lead to mental blocks in memory once you switch to a new topic. Interleaving reduces the likelihood of “blocking” and, instead, allows students to remember concepts better.

The differences between Interleaving and Massed Practice is illustrated below.

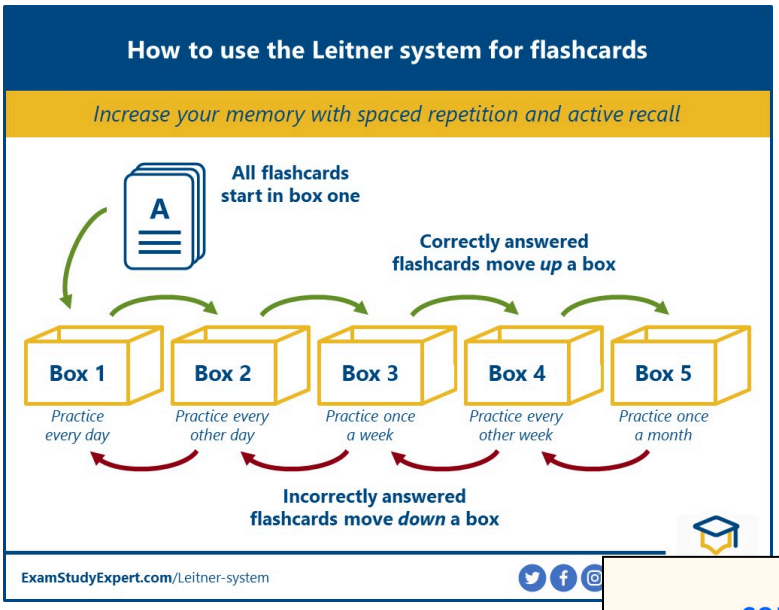




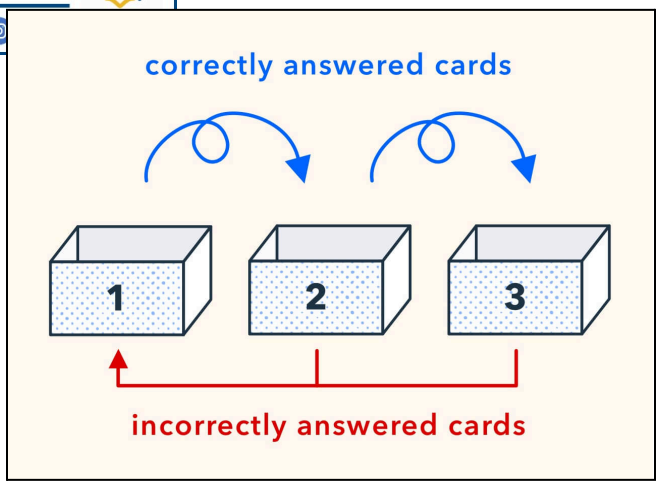
Leitner System - Studying with Flashcards

The Leitner System is a study technique that allows students to space out their learning in order to boost memory and performance. Students who use the Leitner System create flashcards for each individual concept in a course they want to study; in addition, students label 3-5 small boxes that flashcards will be placed into based on level of knowledge.

As flashcards are answered correctly, the student can move them forward in the sequence of boxes. Flashcards that are further along in the box sequence can be reviewed less often, while flashcards closer to the beginning of the box sequence should be reviewed daily. At any point, if a flashcard is answered incorrectly, it should be moved backward into the previous box so that it can be reviewed more often.

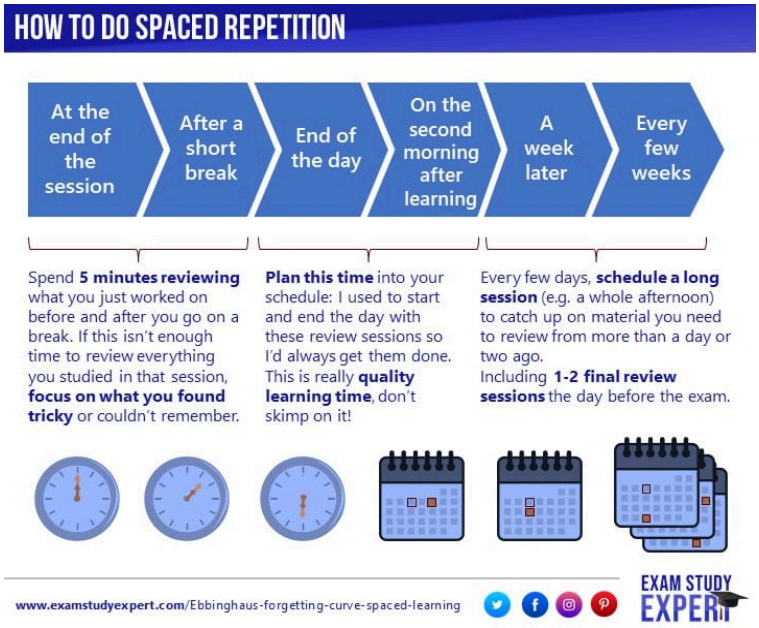


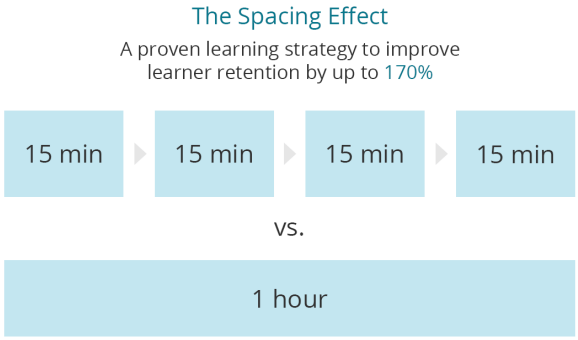
The images to the left and below depict the Leitner System.



Spaced Recall

Research shows that spacing out the learning process has positive effects on transfer of learning and recall. Using Spaced Recall allows students to improve their mastery of content by increasing the amount of review time while maintaining space between study sessions to build retrieval skills.





Another tip is to study in 15 minute increments. Set a timer and work for 15 minutes, take a short break, and then repeat

Key Points: (information from Kang 2016)

- The timing or arrangement of review/practice affects learning.
- Practice is more effective when spaced out over time, instead of massed or grouped together (equating total practice time)
- Spaced practice enhances memory, problem solving, and transfer of learning to new contexts.
- Spaced practice offers great potential for improving students' educational outcomes.

Note-Taking and Note-Reviewing Strategies

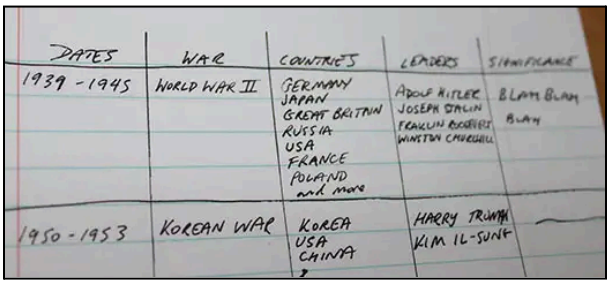
Charting Technique

The Charting Technique allows students to keep track of important events, dates, key figures, and event significance. If your lecture will follow a chronological format, you can prepare a chart, labeling categories and dates, in advance. This technique can also be used to quiz yourself and organize important events when studying for exams.

How to Use the Charting Method:

Country	Capital	Population	Facts	National Flag
Japan	Tokyo	126 million	- negative population growth - aging population - composed of 4 main islands	
New Zealand	Wellington	4.471 million	- oriental name: Aotearoa - the first modern country to give women the right to vote	
Canada	Ottawa	36 million	- the most educated country in the world - has the world's largest coastline	
United States	Washington DC	324 million	- has the world's largest coral reserves - has 50 states	
Australia	Canberra	28 million	- the 6th largest country in terms of land - the Great Barrier Reef is the world's largest reef system	

Think of the created chart as a quick fact sheet for your future reference.

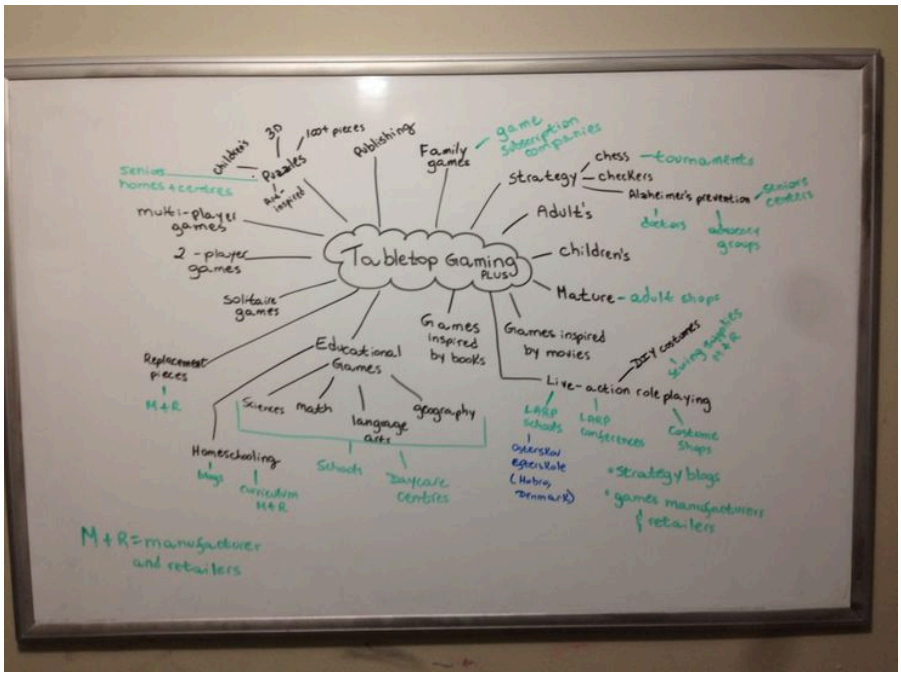


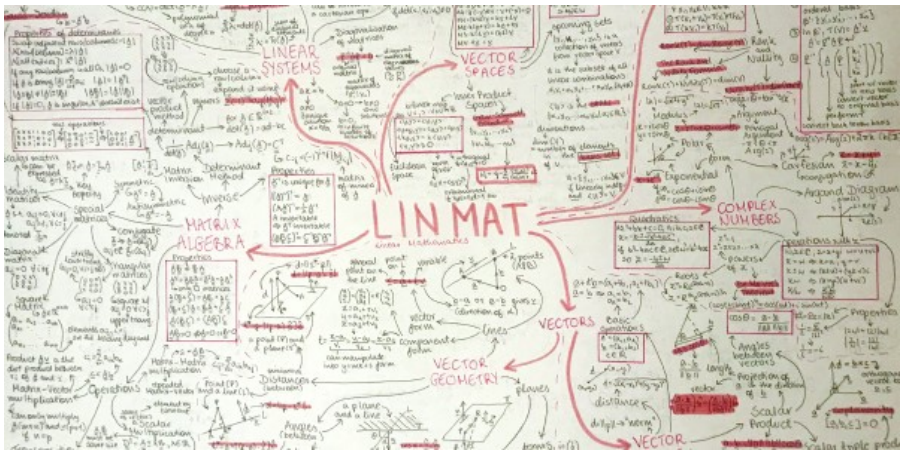
Concept Mapping

Students often use concept mapping to study the relationships between ideas. Through diagraming, students can connect concepts together and learn how these connections may be impactful.

Whether used for brainstorming purposes or for linking terms, concept mapping is an easy way for students to organize course content.

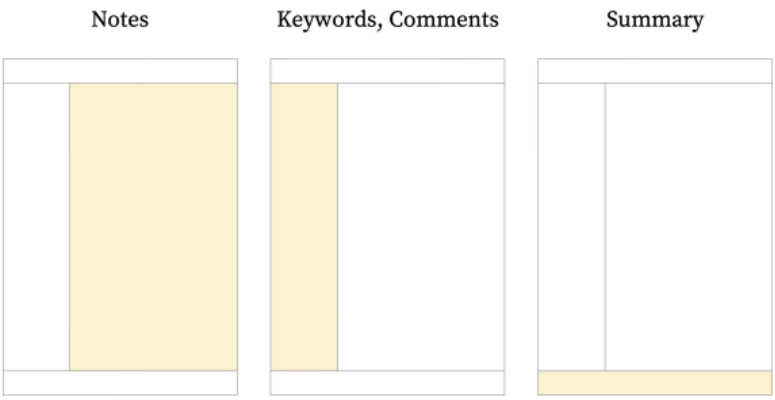
Want a bigger surface? Try using a giant white board to create a concept map.

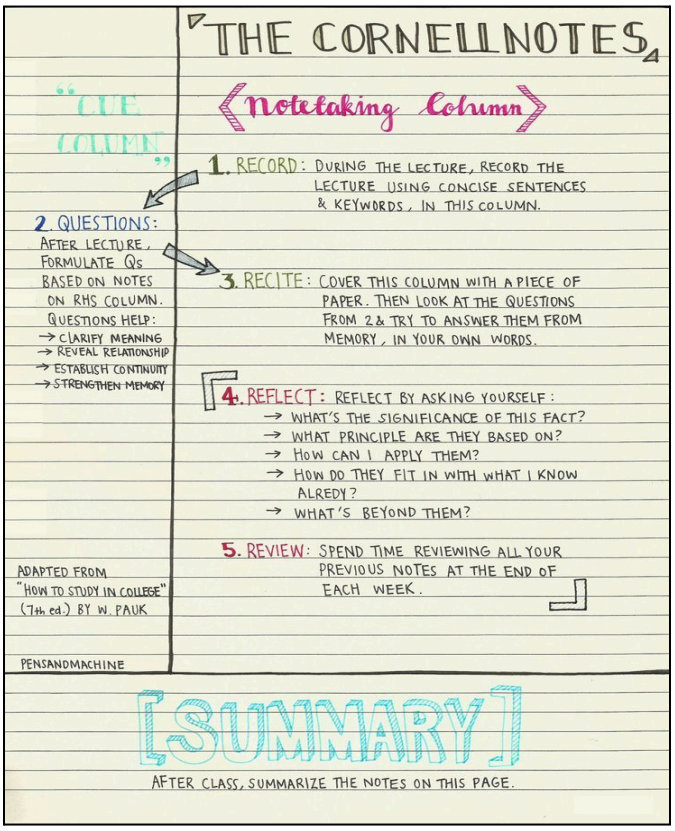




The Cornell Note-Taking Method

Students use the Cornell Method to take, organize, and review class notes. To practice this method, divide your pages into three main sections: notes, cues, and summary. See the below image for guidance on how to format the sections.





During class, take notes in the section for note taking. Try to be concise and focus on writing down key points, definitions, and other important concepts the professor shares.

After class, write down important cues, comments, or questions in the cues section.

Finally, use the summary section to summarize the content on the page or add additional notes for the textbook that you want to have as a supplement.

The picture on the left is an example of how a page would be structured.

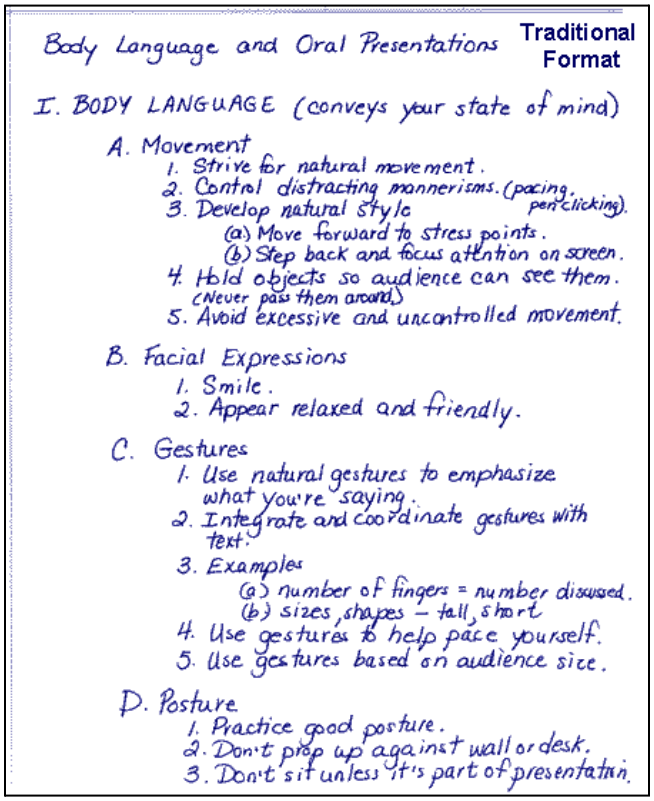
Outline Method

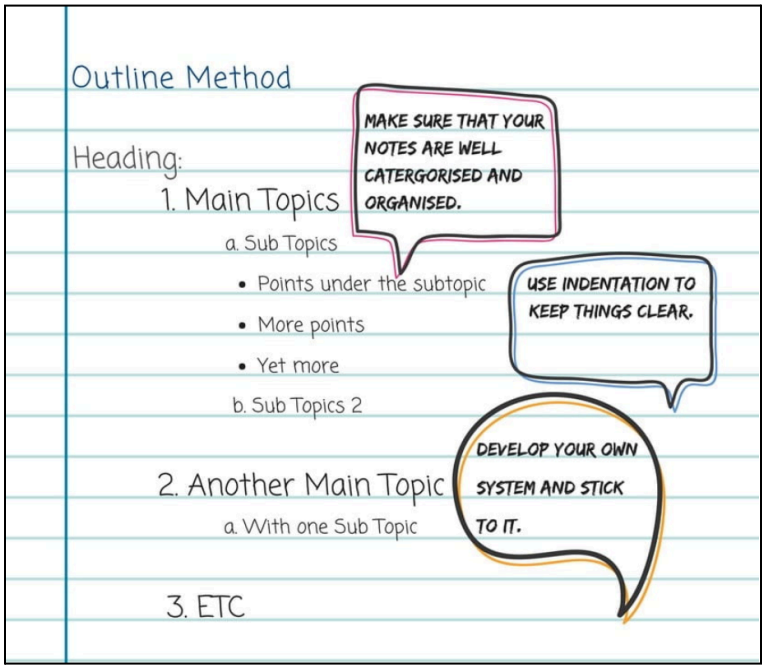
The Outline Method is a note-taking technique that allows students to quickly record key points and course content in an organized way.

Important Things to Remember about the Outlining Method (according to the University of Tennessee Chattanooga):

1. The information which is most general begins at the left with each more specific group of facts indented with spaces to the right.
2. The relationships between the different parts are carried out through indenting.
3. No numbers, letters, or Roman numerals are needed because you can use a bullet point system; however, if you prefer to use numbers, letters, or Roman numerals, then by all means do so.

This note-taking method can be very helpful to use for lecture style classes; however, some students leave a little extra space between points in case they want to go back and add additional thoughts or questions later.





Resources for Reading

General Reading Tips

> "Adjust your speed and style of reading to their reading objectives and the type of materials to be read… Some reading materials can be scanned, skimmed through, and read lightly, while others must [be] read closely and critically" (Kaminske, 2023).

- If your professors provide reading questions or aids, look over those before starting to read in order to have an idea of what sorts of answers and content understanding your professor is looking for
- Read chapter subheaders and summaries prior to reading the text to get an idea of what concepts are generally important in the chapter
- Skim or lightly-read the assigned chapter or article and write down key points
- Try highlighting key points and noting connections in the margins of your readings and textbooks if possible
- Write down any questions you have while reading so you can remember to ask your professor about them during class or office hours

Reading Apps

The College of William & Mary does not directly sponsor any of these apps; however, these apps have been found to be very helpful by many students who use them.

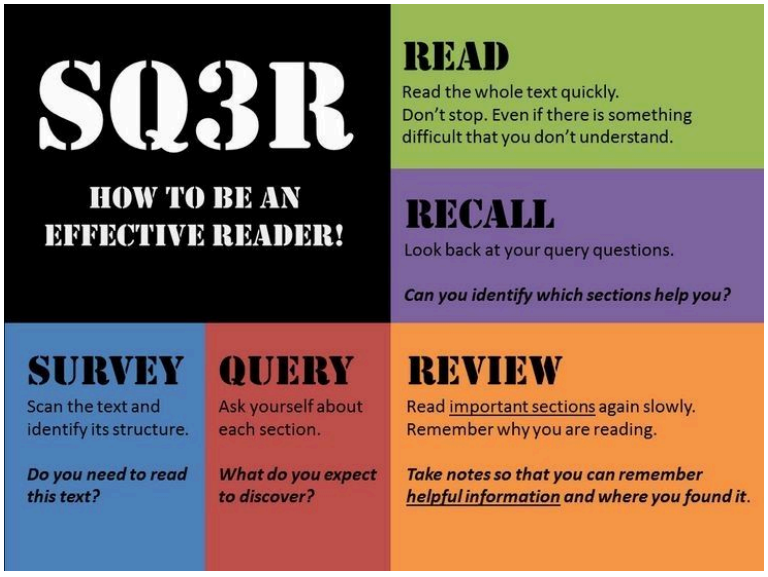
1. ***Bookly*** is an app designed to help students track their reading progress and keep short annotations and notes of the things you've read. For more information about *Bookly*, please click HERE.
2. ***Dolphin EasyReader*** is a free accessible reading app. This app allows students to enlarge the font of their readings, as well as have the readings read out loud if needed. For more information about *Dolphin EasyReader*, please click HERE.
3. ***SwiftRead*** is a reading comprehension app that allows students to learn how to read faster and more efficiently while maintaining high levels of reading comprehension. For more information about *SwiftRead*, please click HERE.

The “SQ3R” Method

According to the Marbella International University Centre, using the SQ3R method while reading allows “the readers to increase their understanding of the text by engaging in the reading process, both before, during, and after, intentionally’.

Steps of SQ3R:

1. **Survey** - a preliminary skim of the text, acknowledging notable headers and charts.
2. **Question** - write down a list of questions based on the survey of content. This may include turning the headers into questions themselves.
3. **Read** - read the text, keeping in mind your previously formed questions
4. **Recall/Recite** - either orally or in writing, answer your questions based on your understanding of the reading. Try to use your own words as much as possible.
5. **Review** - look back over your answers and general content notes. Make a note of any additional questions or key points you want to remember.



Additional SQ3R Strategies

SQ3R READING STRATEGY

FUN-DAMENTALS

STRATEGIES TO USE TO PREPARE FOR READING, ENGAGE IN READING, AND REVIEW READING

HOW TO SURVEY	HOW TO QUESTION	HOW TO READ	HOW TO RECITE	HOW TO REVIEW
• Look over the material: title, preview, headings, visuals, bolded words, summary • Read the summary if possible • Think about background knowledge or information	• Turn headings into questions • Ask what? Who? Why? And How?	• Look for answers to your questions • Write in the margins • Underline or highlight important concepts • Break up the reading into chunks • Take breaks when needed	• Say it out loud in your own words • Write a summary of the paragraph or section • Write notes or notecards for information • Create a mind map or graphic organizer of the ideas and how they relate	• Look over your reading notes and quiz yourself on the information • Make connections between readings and notes from class • Revisit it weekly and test yourself on new and old material each week
WHY SURVEY?	**WHY QUESTION?**	**WHY READ?**	**WHY RECITE?**	**WHY REVIEW?**
• It gives you the big picture • It helps you decide what's important • You can connect information to what you already know • It prepares you to read	• It helps you stay focused on the reading • It gives you a purpose (looking for the answer) and creates interest • It's good practice for quizzing yourself on topics	• It's how to get information from the textbook • It's good preparation for your lectures & discussions • It's an essential part of test preparation	• It helps you retain information after you read it • It checks for your level of understanding • It's a way to interact with the reading and stay awake	• It helps you retain information from week to week • It helps you prepare for exams, papers, and assignments

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The Learning Corner
@ the Academic Success Center
success.oregonstate.edu/learning

SQ3R Chart
Use this to help grasp and absorb textbook and other longer reading passages

Survey	*Record titles and subtitles from selected reading.*
Question	*Write the Questions: "Who, What, Where, When, Why and How?" from the main topics of the reading.*
Read	*Answer the above questions as you read.*
Recite	*Record the fact and phrases that will help you remember the information for the questions.*
Review	*Summarize the information in a paragraph for each question.*

Try creating a chart with each prompt that you can fill in as you read through a chapter or article.

Study Strategies for Math

General Strategies

- **Attend your professor's office hours or tutoring appointments for guidance and extra support**
    - The professors are the experts on the material they teach. The best way to get any questions answered or extra support is to reach out to them for help. Whether it be attending their office hours or asking questions during class, your professors should be able to support you in your understanding of the material.
    - Have more questions? Schedule an appointment to meet with a TutorZone math tutor!
- **Break down problems and try to understand why and how a problem works**
- **Become familiar with commonly used formulas** - consider creating a formula sheet and studying what formulas are related to certain concepts.
- **Practice problems over and over again** - Practicing and solving fundamental problems builds confidence and solidifies understanding of basic concepts. In addition, being comfortable with the basics allows for students to expand their knowledge and understanding when learning more difficult concepts. Make sure to solve different types and complexities of problems
    - After practicing some basic problems for a unit, attempt to solve a few more challenging ones. As you grow more comfortable with harder problems, you can practice breaking them down and explaining your solution process to yourself to boost understanding.
- **Study and practice problems a little bit every day** - last minute cramming may be tempting, however, many students find that practicing a few problems every day increases their understanding and comfort solving problems, as well as allows them to achieve higher grades when exams come around.
- **Watch YouTube Videos** - to improve your understanding and problem-solving skills, consider watching a YouTube video explanation or tutorial.

TutorZone YouTube Channel Recommendations

The College of William & Mary does not directly sponsor any of these channels and videos; however, several of our math tutors highly suggest the following YouTube Channels to students who need additional help understanding and solving mathematical equations.

- **Animated Math, 3Blue1Brown:** https://www.youtube.com/c/3blue1brown
  - Essence of calculus - YouTube
  - Essence of linear algebra - YouTube
  - But what is the Central Limit Theorem?
  - Differential equations - YouTube
- **Introduction to Statistics**

Study Strategies for Science

General Strategies

- **Draw out the major mechanisms.** This allows you to learn the step by step process and it will also organize the material in a way that seems like it is less material.
- **Drawing out relevant pathways.** You can then test yourself on your understanding of the pathway by trying to draw the pathway out from memory. By using this method, students better visualize the concept they are working with and can also practice explaining the process verbally or even written out.
- **Breakdown the material into smaller chunks.** This also allows you to learn the mechanism really well, and if you know the mechanism, you will be able to answer any questions asking how a change can affect the mechanism.
- **Be able to apply concepts to different situations.** Biology professors love to ask about experiments and mutations, making exams applications heavy. Students should have a foundational understanding of the material in addition to being able to apply that knowledge to application questions. For example, students can brainstorm examples of what might happen if one aspect of a pathway goes wrong due to a mutation.
- **Study a little bit every day and start early!** Cramming for an exam is not the best way to study, as you may retain some information but will forget most of it. An hour or two a night looking over information a week or more in advance will allow the student to effectively learn the material, but most importantly to not feel overwhelmed.
- **Practice!** Getting comfortable answering problems will help build confidence and speed, and allow for a stronger performance on the day of the exam.

TutorZone YouTube Channel Recommendations

- **Chads Prep:** Chad's Prep - YouTube
  - Chad's General Chemistry Videos - YouTube
  - Organic Chemistry 2021 - YouTube
  - Chad's General Physics Videos - YouTube

Quick Study Tips

Academic Wellbeing presents . . .

STUDY TIPS

Take brain breaks! Studies show that taking 15 minutes "brain breaks" periodically while studying increases focus and productivity.

Set a fun realistic study plan and execute it consistently.

Work with friends or classmates.

Designate specific times to work on certain assignments

Create a list of priorities. Ask yourself, "what is urgent? Or what can I wait to work on?"

Resource Links

Active Recall

https://www.goodnotes.com/blog/active-recall-studying

https://www.windsor.edu/active-recall-how-to-use-this-effective-study-technique-to-score-a-good-gpa/#:~:text=Active%20recall%20is%20a%20key,and%20improve%20your%20test%20performance.

Charting Technique

https://www.utc.edu/enrollment-management-and-student-affairs/center-for-academic-support-and-advisement/tips-for-academic-success/note-taking#charting

https://sheridancollege.libguides.com/takingnotesmodule/taking-notes-in-class/charting-method

Concept Mapping

https://link.springer.com/content/pdf/10.1007/s10648-014-9273-3.pdf

https://www.verywellmind.com/classical-conditioning-2794859

Concrete Examples

https://www.google.com/url?q=https://lsc.cornell.edu/how-to-study/concept-maps/&sa=D&source=docs&ust=1702045560095489&usg=AOvVaw2aD6csJcvncjEIOeWo58VX

The Cornell Note-Taking Method

https://thinkinsights.net/consulting/cornell-method-great-notes/

https://lsc.cornell.edu/how-to-study/taking-notes/cornell-note-taking-system/

Elaboration (The Feynman Technique)

https://www.bucknell.edu/sites/default/files/teaching_learning_center/feynmantechnique.pdf

https://www.colorado.edu/artssciences-advising/resource-library/life-skills/the-feynman-technique-in-academic-coaching

Interleaving

https://www.google.com/url?q=https://blog.alexanderfyoung.com/interleaving/&sa=D&source=docs&ust=1702051296701775&usg=AOvVaw07M2OT6ITH1q_ZOwh6jYO0

Outline Method
https://www.utc.edu/enrollment-management-and-student-affairs/center-for-academic-support-and-advisement/tips-for-academic-success/note-taking#outlining

https://www.missouristate.edu/BusAdv/_Files/p-24.pdf

Leitner System - Studying with Flashcards
https://mindedge.com/learning-science/the-leitner-system-how-does-it-work/#:~:text=Rather%20than%20cramming%20information%20into,learner's%20own%20needs%20or%20preferences.

https://examstudyexpert.com/leitner-system/

Spaced Recall
https://examstudyexpert.com/spaced-learning/

https://wm.primo.exlibrisgroup.com/discovery/fulldisplay?context=PC&vid=01COWM_INST:01COWM_WM_NEWUI&search_scope=WMCWF&tab=Everything&docid=cdi_scopus_primary_624945111

https://www.youtube.com/watch?v=cVf38y07cfk&t=2s

The "SQ3R" Method & Reading Strategies

https://discover.hubpages.com/education/How-to-Improve-Reading-Comprehension-with-the-SQ3R-Method

https://miuc.org/sq3r-study-method/

https://www.learningscientists.org/blog/2021/8/19-1