

## REVISITING NOTE-TAKING STRATEGIES FOR MATHEMATICS DURING ONLINE CLASSES

\*Muniroh Binti Hamat<sup>1</sup>, Jamal Othman<sup>2</sup>, Rofiza Aboo Bakar<sup>3</sup>  
\*muniroh@uitm.edu.my<sup>1</sup>, jamalothman@uitm.edu.my<sup>2</sup>, rofiza@uitm.edu.my<sup>3</sup>

<sup>1,2</sup>Jabatan Sains Komputer dan Matematik, UiTM Cawangan Pulau Pinang  
<sup>3</sup>Akademi Pengajian Bahasa, UiTM Cawangan Pulau Pinang

### ABSTRACT

*Teaching and learning have been done entirely online for the past two years because of the Covid-19 pandemic. Therefore, students should be aware of the good methods for taking notes in class as the ability in doing so will help them grasp important content well. In turn, reading and revising will be made much easier when they need to only refer to their notes which are simple yet complete with important details. The ability to take notes and write them in a way that corresponds with each lecturer's presentation is an art that should be learnt by all students. However, taking notes is sometimes overlooked by many, especially in mathematics. Thus, students should be informed of note-taking strategies and what to address in and review the materials that they need to read. This article aims to share with students some note-taking strategies that may serve as a guide in helping students improve their performance especially in mathematics.*

**Keywords:** *Online classes, note-taking strategies, improve, mathematics*

### Introduction

Taking good notes may help you remember what you learn in class and can be a useful study tool while studying for tests or examinations. It's critical to select the note-taking approach that best suits your study habits and thinking style. While your method of perfect math note taking may differ from that of others, several components are common. Pay attention in class and ask questions if you don't understand something, then experiment with different note-taking strategies until you discover one that works for you. (Cam, 2021). A good note-taking strategy can lead to more efficient study habits, better course results, and better retention of material after a course has ended (Friedman, 2014).

There are several methods for taking notes in school or at university. Some people prefer an organised approach and use an outline technique to take notes, while others prefer a visual approach and construct mind maps, while yet others employ no structure at all. However, there is one note-taking approach that is better than others in many instances, and research has proved that it is not only more efficient, but also makes it much simpler to review notes, such as while studying for an exam. As part of taking good notes, make sure you understand the information as early as possible, so that it can become more consolidated in your memory with repeated exposure to the material. Get ahead at this point by checking up new terms and topics if your professor posts pre-lecture slides for your upcoming class. Although the lecturer has provided lecture notes in the form of PowerPoint slides, OneNote, PDF files, live notes, and other formats, students must also take lecture notes before, during, and after the

presentation. Students should not depend entirely on lecturer-provided notes. They should integrate the notes in the form of their own understanding and creativity.

Research from iversity.org found out that we forget 47% of what we learn after 20 minutes. Or that we only remember 10% of what was said during an audio lecture. In the online learning world, this can make it hard for you to hold on to new information and material. But worry not, you can recall nearly 80% of a lecture by taking and refreshing yourself on your notes. Notes also help you get a clear of idea of the instructor's main points and keep you concentrated.

### **Notes-taking tips for mathematics.**

Taking notes while attending a lecture online might be difficult, especially if you are used to doing so on your computer. Toggling between your online course screen and a separate note-taking screen is challenging. Taking notes, on the other hand, should not be a difficult activity; rather, it should be a straightforward action that assists pupils in remembering what they've just learned. Here are a few tips to make taking notes for online classes a snap.

#### **1) Take notes by hand**

Taking handwritten notes throughout your online course may seem 'old fashioned,' but it may save you time and remove a lot of unnecessary computer processes. You won't have to go back and forth between your class and your typing document, for example. You won't have to pause any of the videos or courses you're watching. Simply take out a pen and paper and begin writing.

#### **2) Don't Write Everything Down**

According to Friedman (2014), while taking notes during an online course, students tend to write everything down. This is mostly due to the lack of textbooks, handouts, and other resources that would typically be supplied in a regular classroom. Writing down as much as possible, on the other hand, might harm a student's ability to study. Too many notes might result in information overload, reducing the amount of content a student can recall later.

#### **3) Option for diagrams or pictures**

When looking back over your notes, diagrams can also help you capture concepts in a form that you can comprehend and absorb fast. If the information available includes a diagram or picture, save it to your computer so you may print it out and add it to your notes later.

#### 4) Review the notes

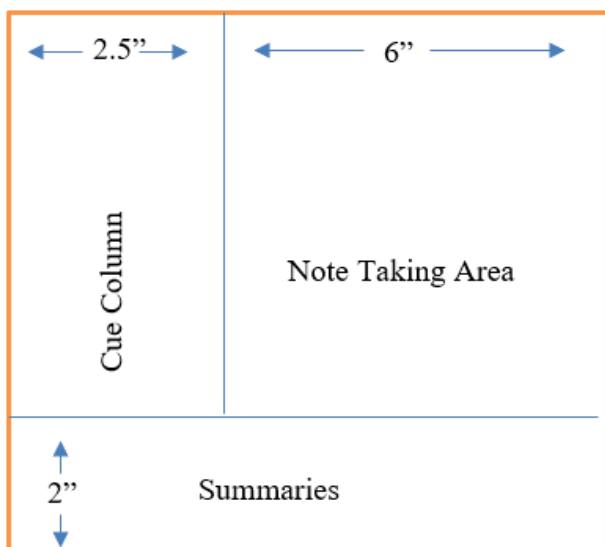
Regardless of whether you take notes by paper, on a computer, or using a phone app, it's a good idea to review your content soon after the online course is over. This is a great time to take notes since the material you've just absorbed is still fresh in your mind.

#### Some suggestion for option of picture and diagram

Draw pictures or diagrams if you're having trouble finding the appropriate words to describe what you're trying to say. They also make it easier to understand and remember information when you're looking back at your notes. Here are some options using this technique.

#### 1) The Cornell Methods

The Cornell technique allows you to condense and organise your notes in a methodical manner without having to recopy them. After you've written your notes in the main area, identify each idea and detail with a key phrase or "cue" in the left-hand space. Rule your paper with a 2-inch margin on the left and a 6-inch margin on the right for notes. During class, jot down notes in the six-inch space. Skip a few lines as the lecturer goes on to a different topic. Complete as many phrases and sentences as you can after class. Create a cue in the left margin for each key piece of information. To review, put a card over your notes, leaving the cues exposed. Say the cue aloud, then say as much of the information below the card as you can. When you've stated everything, you can, move the card and check to see if what you said matches what's written. You know it if you can say it.



**Note Taking Area** - Record the lecture as completely and effectively as possible.

**Cue Column** – Keep the cue column empty while you're taking notes. Immediately after the lecture, reduce your notes to just few short scribbles as hints.

**Summaries** – Sum up each page of your notes in a sentence or two.

## 2) Three Column Method

Students can use the three column notes method to write a question, an answer, and an example. As a result, students will have the opportunity to go deeper into the meaning of the term or phrase by putting it into question form, finding an answer to the question they have written, and presenting an example of the word/phrase in context that they may come across.

Make three equal columns on your pages. The three-column method, unlike the Cornell Method, is developed particularly for use in math lectures. To better organise your notes, you'll use each column for various types of material. With a ruler, divide the page into three pieces by drawing two lines from the top of the lined portion to the bottom. You may want to draw your separating lines using a marker or different coloured ink to make them stand out.

Problem	Solution	Explanation
Find an equation of the line with slope 4 that contains the point (2, =1).	Step 1: $y = 4x + b$	Substitute 4 for the "m" in $y = mx + b$ ; "m" is the slope.
	Step 2: $-1 = 4(2) + b$	Replace x with 2 and y with =1 in the equation.
	Step 3: $-1 = 8 + b$	In ordered pairs, the first value is for x, the second is for y.
	Step 4: $-9 = b$	Multiply to simplify.
	Step 5: Equation: $y = 4x - 9$	Solve for b by subtracting 8 from both sides.
	Step 6: $-1 = 4(2) - 9$ Is this true?	Replace the "b" with -9 in the equation $y = 4x + b$ .
	Step 7: $-1 = 8 - 9$ YES	Check the answer by substituting the x and y values in the answer.

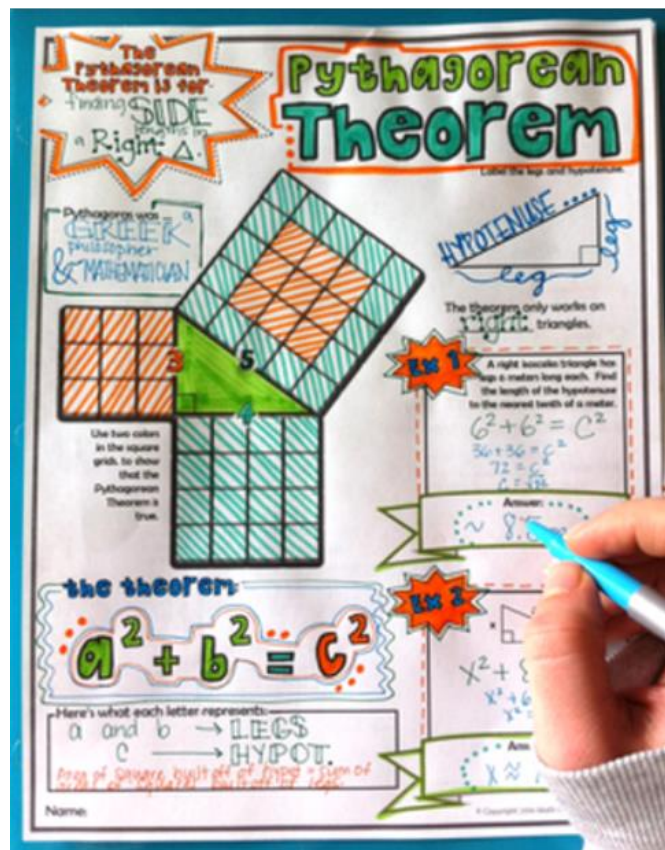
Key Words	Examples	Explanations/Rules
Distributive Property	$2(3x - 1) = 10$	Distribute to clear ( ).
Add the opposite of Term FIRST.	$6x - 2 = 10$ $\quad \quad \quad \cancel{-2} \quad \quad \quad +2$ <hr/> $6x = 12$	Add the opposite of the term, -2, to eliminate the term & compensate on other side by doing the same.
Divide by factor LAST.	$\cancel{6}x = 12$ <hr/> $\quad \quad \quad \cancel{6} \quad \quad \quad 6$	Divide by the factor, 6, to eliminate the factor & compensate by doing the same to the other side.
	$x = 2$	When x is all alone on one side, the equation is <u>solved</u> .

Step 1 : Record each problem step in the ‘Examples’ section.

Step 2 : Record the reason for each step in ‘Explanations/Rules’ section by using abbreviations, short phrase (not sentence) or key words, formulas and properties.

Step3 : Record key words and concepts in left hand side section either during or immediately after lecture by reworking the notes.

### 3) Doodle Notes Strategy



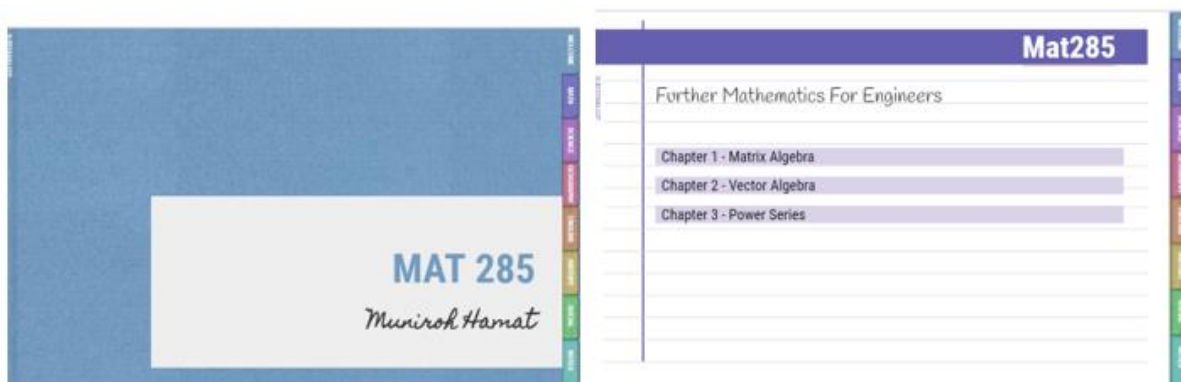
Doodling and colouring in a left-brain oriented subject like mathematics increases communication across the corpus callosum, the bundle of nerve fibres that divides the brain's two hemispheres. Relaxation is an extra benefit. These doodle notes, like the new adult colouring book therapy trend, can assist to reduce mathematics anxiety.

A recent study found that doodling really increases focus and recall of new knowledge. Students may utilise coloured pencils and the right side of their brains to recall important terminology, mathematical examples, and new ideas more easily with these colour-it-in, doodle-friendly note techniques.

4) Digital Notebook with section



Digital notebooks for distance learning and 1:1 classroom. Landscape and Portrait versions. Students can use it as is in Google Slides or PowerPoint or they can duplicate as many pages as they want or need, then save the file as PDF and use it with apps such as Good Notes, Notability or any PDF reader that supports handwriting with a stylus.



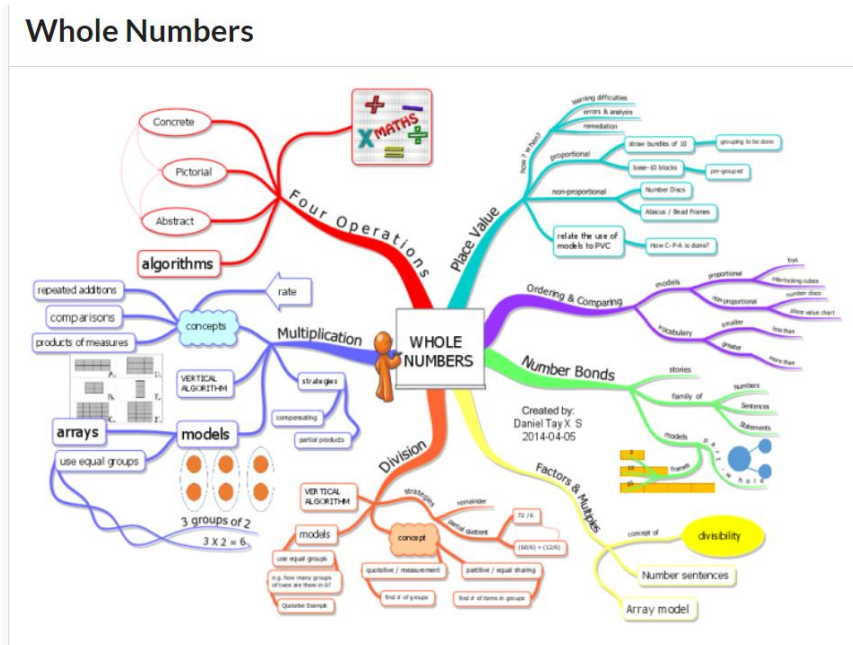
### 5) The Boxing Method



To begin, students should study and read mathematical notes twice: once while writing them and again when placing them in boxes. It's easier for me as a visual thinker to keep notes on different topics separated. It makes it easier for students to remember and recall them at the appropriate moments. It's easy to focus on one box at a time when studying. Because we don't want the boxes to be very long or wide, the notes are significantly shorter. When students use ruled/quad ruled paper, they can use the space much more efficiently. It's simple to move notes around using it.

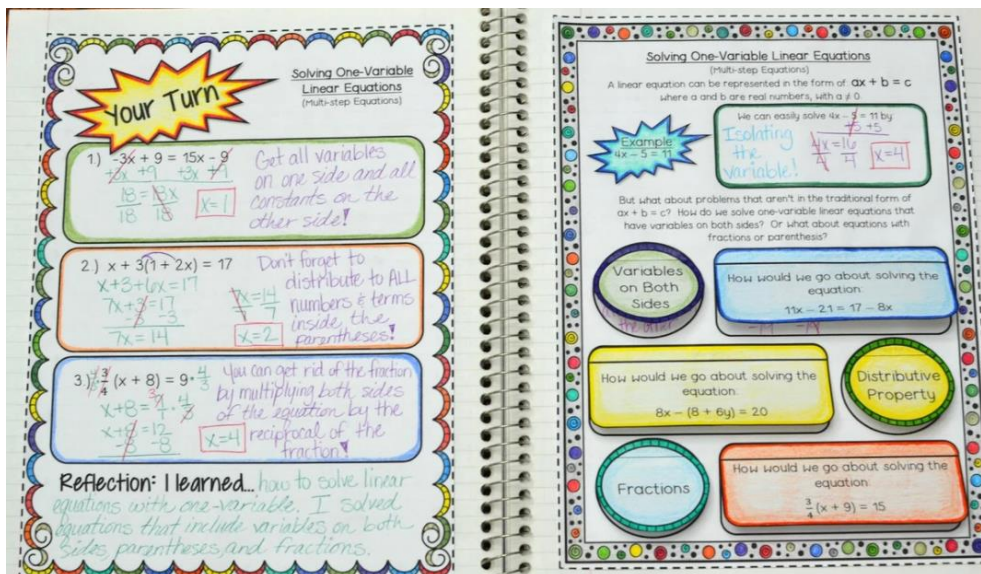
### 6) The Mapping Method

Mind mapping is a process where all the brainstorming, such as designing a business strategy, investigating an error, defining an approach to achieve a specified target, learning a complex concept or subject, etc. It is done via graphical illustrations, typically using a well-labelled diagram. A mind map comprises a box that represents the main topic of the plan or strategy. This box can then be further extended with the help of several small boxes that represent categories or parts, and with even smaller boxes to denote subcategories, and so on.



7) **Foldable**

A foldable graphic organizer is one that folds in some way. In the last few years, foldables have been used to help engage students in the classroom. There has been a large push in recent years to move towards a classroom with more hands-on learning and student-centered classrooms. Foldables were created to help present material that would otherwise be given in direct instruction or notes in order to engage students and get them to do the thinking.





## Conclusion

However, the best note-taking strategy for you will depend on your learning needs as well as the type of learner you are. Logical learners such as students in mathematics classes the methods that better to use are involved with logic, reasoning, patterns, and other systems to understand new information. The best note-taking method for logical learners is those that involve associations or connecting seemingly unrelated ideas together, such as the Boxing Method, Charting, or Mapping.

## References

- Academic Centre for Excellence, The Florida State University. (n.d.). Note taking tips for math. [http://ace.fsu.acsitefactory.com/sites/g/files/upcbnu296/files/Math\\_Note\\_Making\\_System.pdf](http://ace.fsu.acsitefactory.com/sites/g/files/upcbnu296/files/Math_Note_Making_System.pdf)
- Cam, D. (2021). How to take perfect math note. <https://www.wikihow.com/Take-Perfect-Math-Notes>
- Cara mengambil nota matematik yang sempurna (n.d.). <https://ms.rgbsf.com/Take-Perfect-Math-Notes-9133>
- Chang, S. (2020). How to take rock-solid notes for online lectures. <https://students.ubc.ca/ubclife/take-rock-solid-notes-online-lectures>
- Cornell note taking — The best way to take notes explained. (n.d.). <https://medium.goodnotes.com/study-with-ease-the-best-way-to-take-notes-2749a3e8297b>
- Edmond, S. (2015). Three-Column Note-Taking. <http://www.edmondschools.net/portals/0/docs/three-columnnotes.pdf>.
- Friedman, MC., Notes on note-taking: Review of research and insights for students and instructor. Havard Initiative for Learning and Teaching, 1-34.
- How to take study notes: 5 effective note taking methods. (2017). <https://www.oxfordlearning.com/5-effective-note-taking-methods/>
- Lundin, E. (2021). How to take better notes: The 6 best note-taking systems. <https://collegeinfo geek.com/how-to-take-notes-in-college/>
- Pauk, W. & Owens, R. J. Q. (2005). How to study in college (8<sup>th</sup> edition). Houghton Mifflin Company.
- Robinson, K. (2005). Cornell notetaking method. <https://lifel hacker.com/cornell-notetaking-method-125400>
- The University of Tennessee. (n.d.). Common note-taking methods. <https://www.utc.edu/enrollment-management-and-student-affairs/center-for-academic-support-and-advisement/tips-for-academic-success/note-taking>
- Math strategies (n.d.). <https://mathematicstrategies.weebly.com/cornell-notes.html>