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**Sandwich
Junior
High
SCHOOL**

HOW TO STUDY EFFECTIVELY

"The best way to predict your future is to create it." Abraham Lincon

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How should I study to make best use of my time?

Have you ever been told to go off and study but not really been sure how to do it?

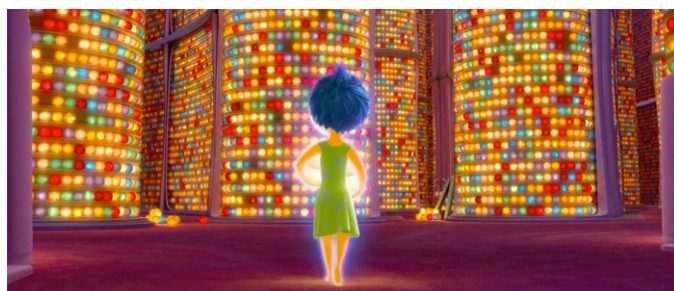
There are lots of skills involved in studying successfully:

- knowing how to rephrase things using your own words
- knowing how to select what's important and what isn't
- knowing how to use mind mapping
- knowing how to use flash cards
- knowing methods of note-taking such as the Cornell Method

This is all important stuff and we will go over as much as we can over the course of this term. However, in this booklet we are focusing on something different; we are focusing on how to study in order to help you store information in your long-term memory. We are going to cover six powerful research-based strategies that are proven to help students perform better in exams but also to retain that information long after the exam is over. Why is this important? Because if you are going on to study that subject again in the future, or need any of the information covered in that subject ever again, these strategies will mean that knowledge is stored away in your long-term memory just waiting to be accessed when you need it.

You might not want to, or feel able to, use all these strategies but if you can work even one or two of these methods into your study program, you stand a much better chance of actually remembering the material - and acing those exams!

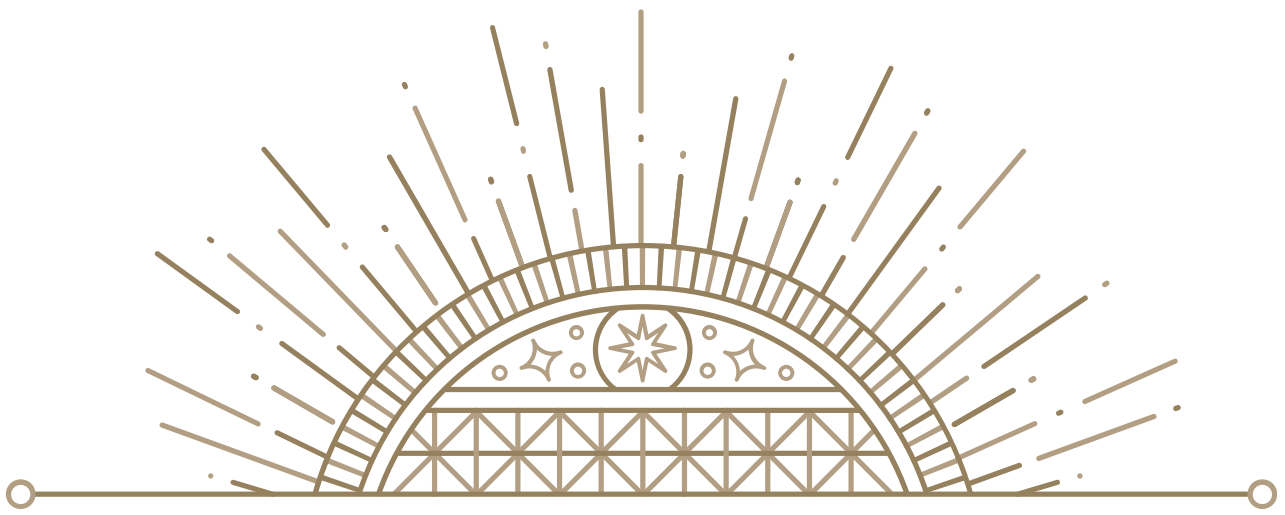
The information in this guide to study is based on a fantastic podcast by educator Jennifer Gonzalez called 'Cult of Pedagogy'. The episode is number 58. In it she interviews two cognitive scientists, Yana Weinstein and Megan Smith, who are dedicated to helping us all understand how we learn and how to study more efficiently. Their website is called The Learning Scientists. If you fancy taking a deeper dive into this topic go take a look and/or have a listen.





1. **SPACED PRACTICE**

**Space out your
study over time**



What is spaced practice, why does it work and how do I use it?

Many students wait until the night before a test to study for it. Similarly, teachers often wait until the day before a test to review. When enough students score well on the test, it appears they have learned the material. However, a few weeks later most of that information has vanished from students' minds.

For more durable learning, the studying has to take place in smaller chunks over time.

“Every time you leave a little space, you forget a bit of the information, and then you kind of relearn it,” cognitive scientist Yana Weinstein explains. “That forgetting actually helps you to strengthen the memory. It’s kind of counterintuitive, but you need to forget a little bit in order to then help yourself learn it by remembering again.”

To help you use spaced practice create a studying calendar/timetable to plan out how you will review chunks of content. You should also carve out small chunks of time everyday for review. In both cases, plan to include the things your currently studying in class concepts AND previously learned material





LEARN TO STUDY USING...

Spaced Practice

SPACE OUT YOUR STUDYING OVER TIME

LEARNINGSCIENTISTS.ORG



HOW TO DO IT

Start planning early for exams, and set aside a little bit of time every day. Five hours spread out over two weeks is better than the same five hours all at once.



Review information from each class, but not immediately after class.



After you review information from the most recent class, make sure to go back and study important older information to keep it fresh.



HOLD ON!



When you sit down to study, make sure you are using effective study strategies rather than just re-reading your class notes.



This may seem difficult and you may forget some information from day to day, but this is actually a good thing! This forces you to retrieve information from memory (see Retrieval Practice poster).



Create small spaces (a few days) and do a little bit over time, so that it adds up!

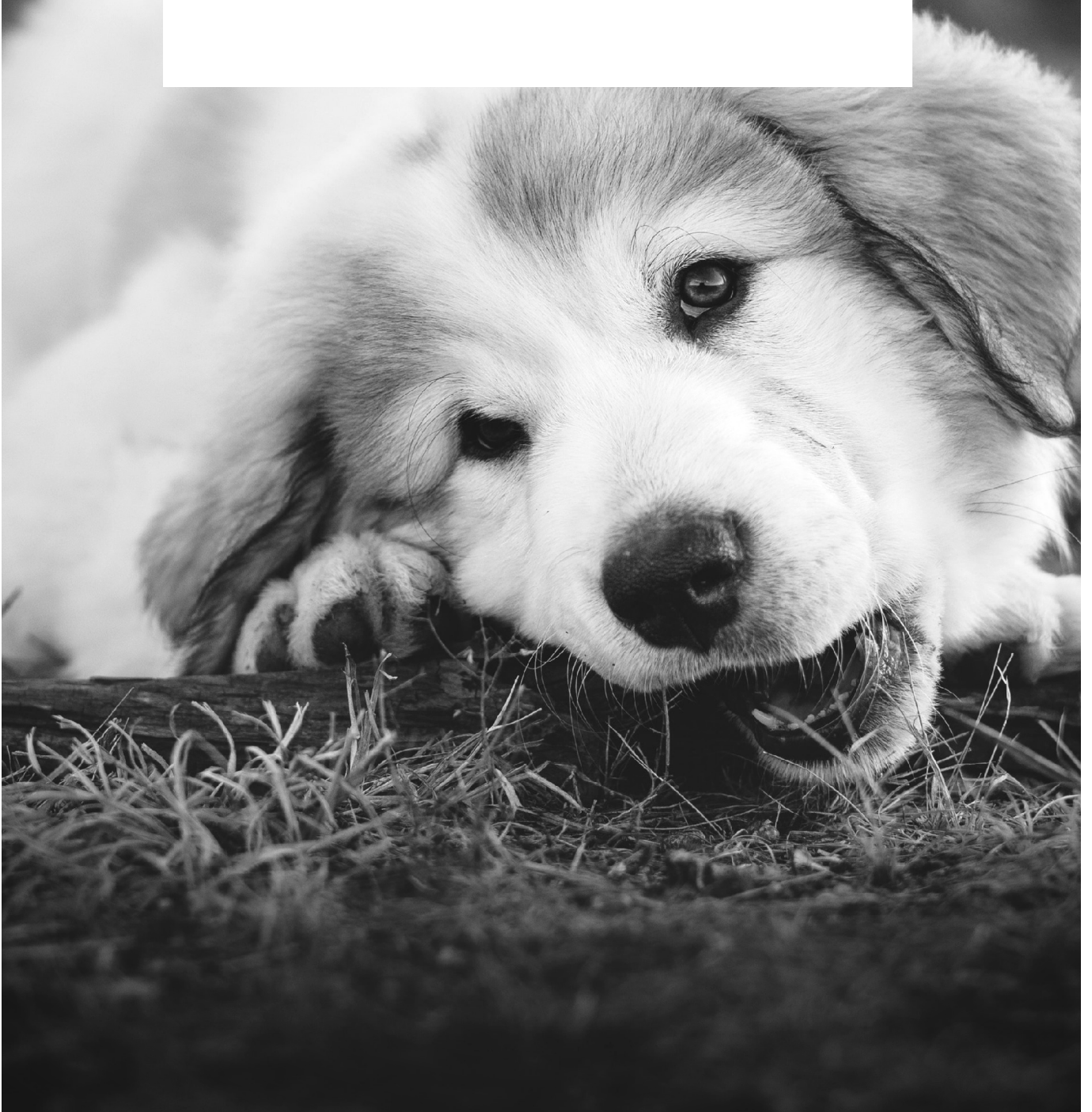
RESEARCH

Read more about spaced practice as a study strategy

Benjamin, A. S., & Tullis, J. (2010). What makes distributed practice effective? *Cognitive Psychology*, 61, 228-247.

2. Retrieval Practice

Practice bringing information to mind without the help of materials.





What is retrieval practice, why does it work and how can I apply it in my own study?

Many people think of “studying” as simply re-reading notes, textbooks, or other materials. But having the information right in front of us doesn’t force us to retrieve it from memory; instead, it allows us to trick ourselves into thinking we know something.

Recalling information without supporting materials helps us learn it much more effectively.

“Put your class materials away, and then write out or maybe sketch or speak everything you know and try to be as thorough as possible and then check your materials for accuracy,” Smith advises. “You’re bringing information to mind almost like you’re testing yourself. Though it can be a practice test, it doesn’t have to be. You can just sort of go through and explain what you know to a family member or teach a friend or explain what you know to your voice recorder. It doesn’t matter how or to whom you do it; the key is to work without notes and change the way information is stored in your brain making it easier to access and understand later on.

When the retrieval practice task is done, check your understanding by revisiting your materials and working out where you’ve misremembered or misunderstood something.





LEARN TO STUDY USING... Retrieval Practice

PRACTICE BRINGING INFORMATION TO MIND

LEARNINGSOCIETISTS.ORG



HOW TO DO IT

Put away your class materials, and write or sketch everything you know. Be as thorough as possible. Then, check your class materials for accuracy and important points you missed.



Take as many practice tests as you can get your hands on. If you don't have ready-made tests, try making your own and trading with a friend who has done the same.



You can also make flashcards. Just make sure you practice recalling the information on them, and go beyond definitions by thinking of links between ideas.



HOLD ON!



Retrieval practice works best when you go back to check your class materials for accuracy afterward.



Retrieval is hard! If you're struggling, identify the things you've missed from your class materials, and work your way up to recalling it on your own with the class materials closed.



Don't only recall words and definitions. Make sure to recall main ideas, how things are related or different from one another, and new examples.

RESEARCH

Read more about retrieval practice as a study strategy

Roediger, H. L., Putnam, A. L., & Smith, M. A. (2011). Ten benefits of testing and their applications to educational practice. In J. Mestre & B. Ross (Eds.), *Psychology of learning and motivation: Cognition in education*, (pp. 1-36). Oxford: Elsevier.



Interleaving

Switching between ideas while you study



What is interleaving and how do you do it?

Common knowledge tells us that to learn a skill, we should practice it over and over again. While repetition is vital, research says we will actually learn that skill more effectively if we mix our practice of it with other skills. This is known as interleaving.

“Let’s say you’re doing a bunch of math problems,” Weinstein says. “What’s fairly typical is ... five of the same problem, or 10 of the same problem. Instead of doing that, try different problems in different orders.”

So if you are learning to calculate the area of a triangle, instead of doing 20 problems with triangles, do one of a triangle, then one of a circle, then a triangle, then a square.

“The thing about that,” Weinstein notes, “is that it’s actually harder. So (you’ll) be getting more wrong, (you’ll) be making more errors, but (you’ll) also be learning something very important, which is how to choose a particular strategy for each problem, as opposed to just repeatedly doing the same thing.”

Resist the temptation to repeat the exact same process multiple times in a row. Instead, do a few of the new process, then weave in other skills, so that the repetitive behaviour is interrupted and you are forced to think more critically.





LEARN TO STUDY USING...

Interleaving

SWITCH BETWEEN IDEAS WHILE YOU STUDY

LEARNINGSOCIETISTS.ORG



HOW TO DO IT

Switch between ideas during a study session. Don't study one idea for too long.



Go back over the ideas again in different orders to strengthen your understanding.

TOPICS
A B C



STUDY
SESSION
1

TOPICS
C B A



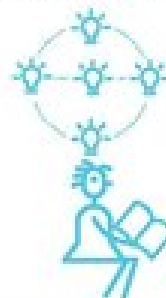
STUDY
SESSION
2

TOPICS
A C B



STUDY
SESSION
3

Make links between different ideas as you switch between them.



HOLD ON!



While it's good to switch between ideas, don't switch too often, or spend too little time on any one idea; you need to make sure you understand them.



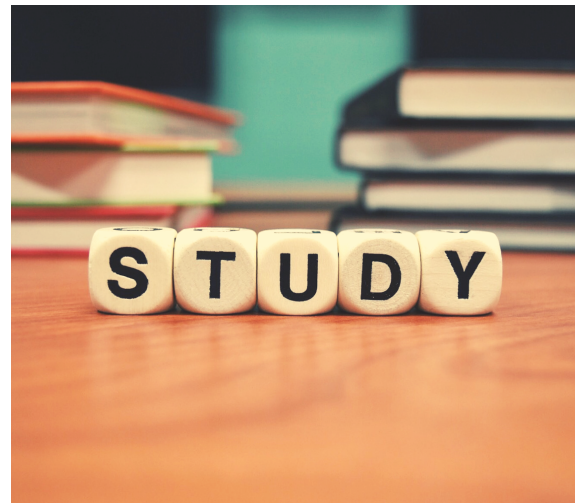
Interleaving will feel harder than studying the same thing for a long time. But don't worry - this is actually helpful to your learning!

RESEARCH

Read more about interleaving as a study strategy

Rohrer, D. (2012). Interleaving helps students distinguish among similar concepts. *Educational Psychology Review*, 24, 355-367.

**Dual
Coding**
Combine
Words and
Visuals





What is dual coding and how do you use it?

When information is presented to us, it is often accompanied by some kind of visual: an image, a chart or graph, or a graphic organiser. When you are studying, you should make it a habit to pay attention to those visuals and link them to the text by explaining what they mean in your own words. Then, you can create your own visuals of the concepts you are learning. This process reinforces the concepts in the brain through two different paths, making it easier to retrieve later.

“And when we say visuals,” Smith explains, “we don’t necessarily mean anything specific, so it depends on the types of materials. You could have an infographic, a cartoon strip, a diagram, a graphic organizer, timeline, anything that makes sense to you so long as you’re sort of depicting the information both in a way with words and a way with pictures.”

“This isn’t just for students who are good at drawing,” Weinstein adds. “It’s not about the quality of the drawing. It really just needs to be a visual representation as you can depict it.”

Look at the visuals used in textbooks, on websites, and even in teachers' slideshow presentations. Make connections with what you’re learning. Create your own visuals of the content you are covering to further reinforce it. You can include diagramming, sketching and creating graphic organisers when you study at home.





LEARN TO STUDY USING...

Dual Coding

COMBINE WORDS AND VISUALS

LEARNINGSOCIETISTS.ORG



HOW TO DO IT



Look at your class materials and find visuals. Look over the visuals and compare to the words.



Look at visuals, and explain in your own words what they mean.

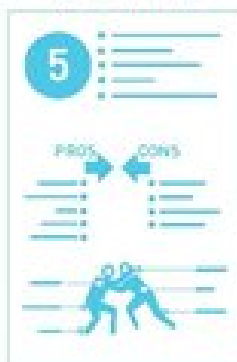


Take information that you are trying to learn, and draw visuals to go along with it.

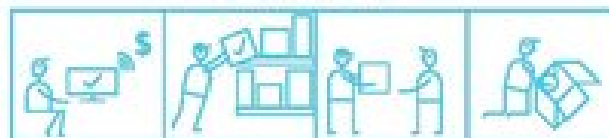
HOLD ON!

Try to come up with different ways to represent the information visually, for example an infographic, a timeline, a cartoon strip, or a diagram of parts that work together.

INFOGRAPHIC



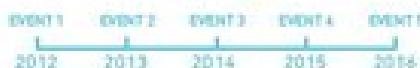
CARTOON STRIP



DIAGRAM



TIMELINE



GRAPHIC ORGANIZER



Work your way up to drawing what you know from memory.



RESEARCH

Read more about dual coding as a study strategy

Mayer, R. E., & Anderson, R. B. (1992). The instructive animation: Helping students build connections between words and pictures in multimedia learning. *Journal of Educational Psychology*, 4, 444-452.