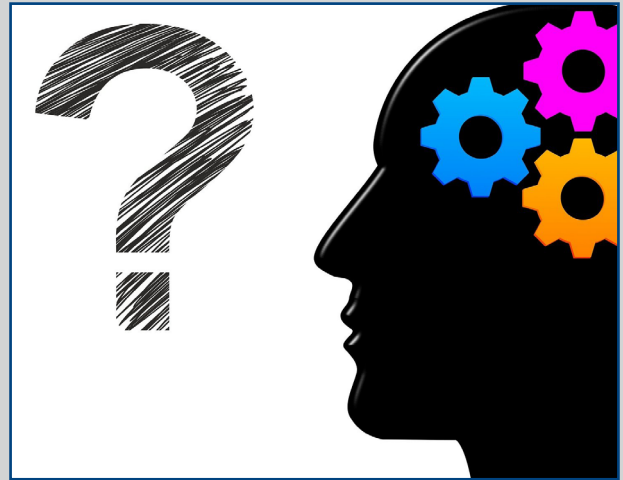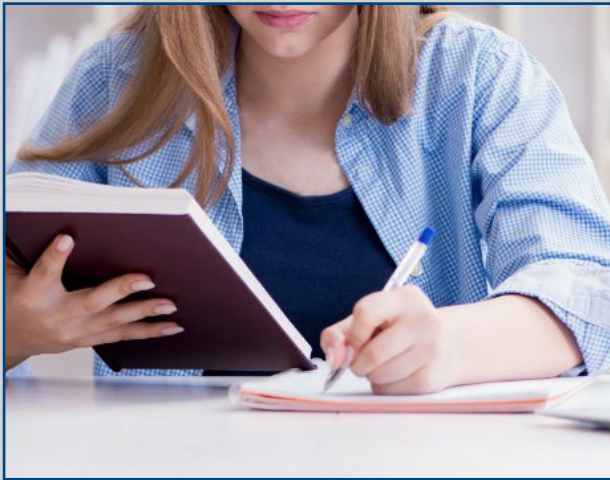# Revision Strategies

Understanding the 'Cognitive Load' theory to help you revisit information

'Cognitive Load' Theory was developed by John Sweller out of the study of problem solving.

What is Cognitive Load?

Cognitive load is the amount of information our working memory can hold at any one time. The **working memory** is where we **process information** and is key to learning.

How do we process new information?
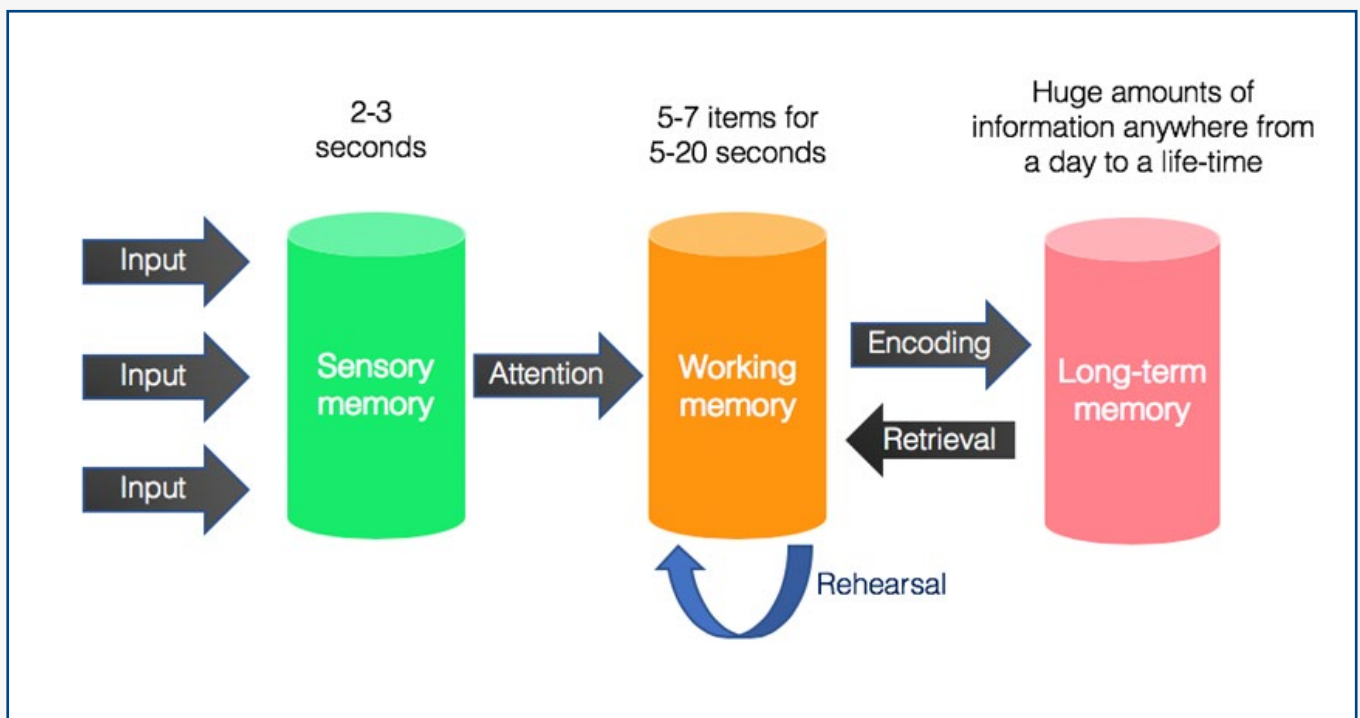
The capacity of our working memory is limited

We must therefore manage our working memory using different strategies. **There are 3 types of working memory:**

1. **Intrinsic Load** - this means how complex a task is. If a task or problem is really complex then it can take over most of our working memory. If a task is simple it uses less working memory.
2. **Extraneous Load** - these are the instructions you are given or how questions are written. Incomplete instructions take up space in working memory and don't help you learn.
3. **Germane Load** - This is the amount of work you put in to create a permanent store of knowledge.

What does this mean? You should ALWAYS ASK if you don't understand

Top 10 tips to help you apply the Cognitive Load Theory to revisit and learn new information:

1. **Break the problem down into parts.** This reduces the problem space and lightens the cognitive load, making learning more effective
2. **Look at worked examples** to understand how to complete tasks
3. Take advantage of **auditory and visual channels** in your working memory
4. Start with **learning simple information** and build on it
5. **Create an environment with as few distractions** as possible so turn off your phone, music or the TV. Distractions add to your working memory
6. **Avoid overloading your brain** with too much information at one time
7. **Always review information** from your lessons as you go along because this will help improve your retention and add knowledge to your long-term memory
8. **Focus on one task or topic at a time**
9. **Rehearse the components of a complex task** so that it becomes automated, thus freeing up working memory capacity
10. **Create stories from information** to be remembered or group information into more memorable categories or more accessible chunks

Did you know?

The mind processes visual and auditory information separately BUT too much visual and text displayed together compete with each other in your mind.

When you have multiple sources of visual information, such as diagrams, labels and explanatory text, your attention is divided between them. This adds to the cognitive load, making it more difficult for you to learn.

Top tips to help you revise:

- **Incorporate labels into diagrams** rather than writing text in separate boxes
- **Use acronyms to help you learn** so information can be 'retrieved' more easily from your memory
- **Try talking through the problem out loud**
- **Watch videos with animation** and voiceovers

How will using the Cognitive Load Theory affect your learning?

- Improve your long-term memory and knowledge
- Learn new skills more easily
- Remove unnecessary distractions
- Reduce anxiety and feelings of being overwhelmed

Don't overload your brain when you want to learn more efficiently!

Using flashcards for revision

Using flashcards

- Using flashcards is a repetition strategy
- They are a simple 'cue' on the front and an 'answer' on the back
- Flashcards engage 'active recall'

Why flashcards can help you learn

- **They engage in 'Active recall'** - this creates stronger connections for your memory to recall information
- **They promote self-reflection** - also known as **metacognition**, which firmly commits knowledge to your memory
- **Metacognition** - When you make and use flashcards, you take control of your own learning. You have to decide what to put on each card, how often you're going to use them, and then evaluate how well you know the information on each card
- They can **help you memorise facts quickly**
- **Drilling** - flashcards help you to practise the same information over and over again - and as we know, practice makes perfect

> *You need to 'be smart' when making and using flashcards to make sure you are effective.*

How to make flashcards

1. Ensure that the flashcards have a **question or key term** on one side and the **answer or definition** on the other - the flashcard must work the memory - if flashcards only contain notes then no **retrieval practice** will be happening
2. Ensure the right questions and knowledge are on the cards
3. Keep information as short as possible
4. Write clearly. You should be able to read what you wrote at a very quick glance
5. Use different **coloured cards or pens** to categorise your flashcards. For example, use a different colour for each subject or topic. This can help your brain to categorise information better
6. Make your flashcards as soon as you've learnt the topic in class

> *Studies have found that it's more effective to review a whole stack of cards in one sitting rather than to carry them around with you and glance at them every so often.*
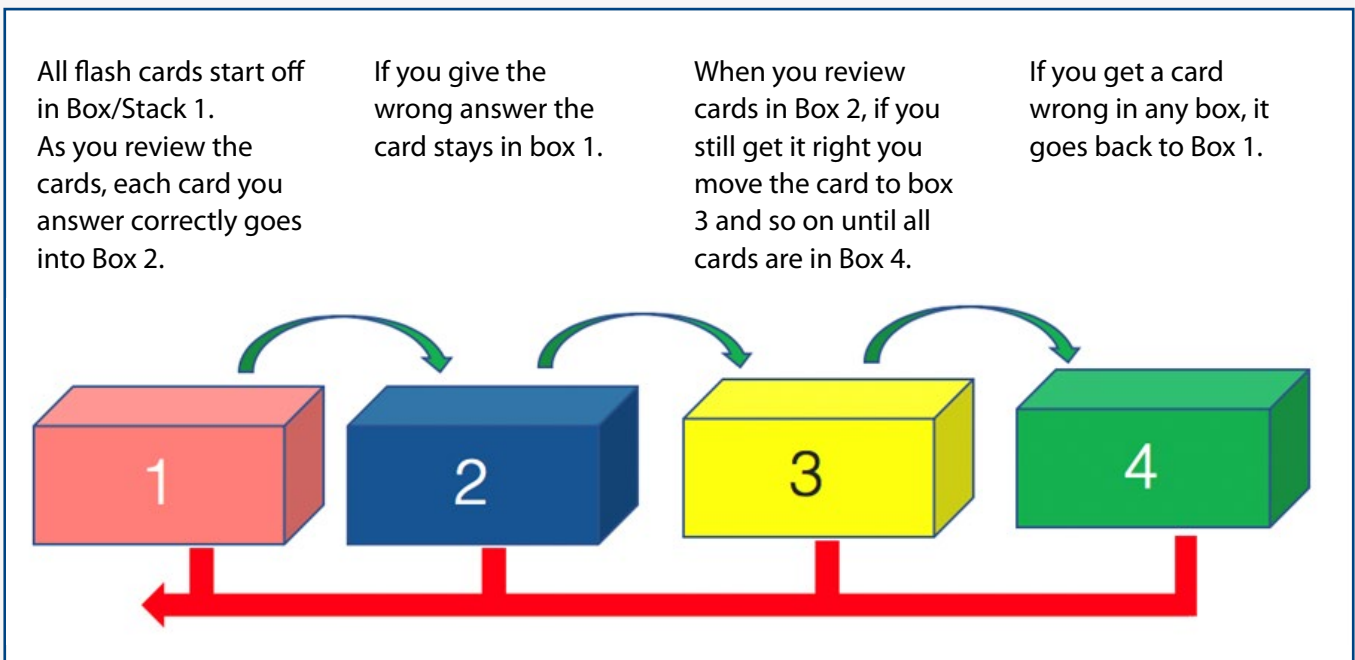
Being smart when using flashcards

1. **Use spaced repetition** - review your cards at specific, increasing intervals: for example, on Day 1, Day 2, Day 4, Day 8 and so on. Spaced repetition works because it activates your long-term memory, while leaving small breaks in between studying uses your short-term memory

2. Make sure you have a **'thinking pause'** after picking the card up and reading the question, then turn it over to read the information

3. Once you get an answer right using your flashcard - **DO NOT DISCARD IT!** You need to keep **repeating the question** even if you get it right multiple times - otherwise it will fall off your memory

4. As well as retrieving your knowledge, **try writing the answer or definition in your own words and giving examples.** This will help your learning and recall

5. **Try 'interleaving'.** Once you have several decks of flashcards for different subjects and topics, try mixing them up. This will test your knowledge across subjects in a single session. Make sure **you are confident** enough to do this every so often

Using a system to revise with flashcards

The **Leitner System** is a well-known and very effective method of using flashcards. It's a form of **spaced repetition** that help you study the cards you don't know more often than the cards you already know well.

Leitner System - The Method

All flash cards start off in Box/Stack 1.
As you review the cards, each card you answer correctly goes into Box 2.

If you give the wrong answer the card stays in box 1.

When you review cards in Box 2, if you still get it right you move the card to box 3 and so on until all cards are in Box 4.

If you get a card wrong in any box, it goes back to Box 1.

- The key is that the cards you know less well are reviewed more frequently than the cards in the higher boxes
- You now must choose the frequency at which you review each box
- For example - Box 1: Every day, Box 2: Every 2 days, Box 3: Every 3 days, Box 4: Every 4 days

Spacing and timing of revision to help you learn

Did you know? The brain requires a physical **'prompt'** in order to keep something in **long-term memory.** Otherwise, it is designed to **let it go.**

What is 'Spacing'?

- Spacing is a revision technique which is all about **spacing out your revision** so you don't get swamped and overwhelmed
- It means introducing **time intervals** into your revision sessions as well as spacing out the days which you use to revise for topics
- To commit something to memory, it takes time and repetition

Why is spacing beneficial?

- Doing something little and often – **spacing** – beats doing it all at once, or cramming.
- The time in between revision allows you to forget and re-learn the information, which cements it in your **long-term memory**
- We can learn more information over time than in one longer session
- It helps you revise more efficiently

Optimal spacing

- Research suggests there is an 'optimal gap' between revision sessions so you can retain the information
- If the test is in a month, you should review the information around once a week. If the test is in a week, create time once a day

Time to the test	Revision gap
1 Week	1-2 Days
1 Month	1 Week
3 Months	2 Weeks
6 Months	3 Weeks
1 Year	1 Month

What does this mean? You should ALWAYS ASK if you don't understand

Create the perfect revision plan using the spacing technique

1. **Organisation:** determine where you need to focus your time - e.g. which subjects, topics, what you know, what you struggle with etc.

2. **Planning:** map out what you are going to revise and when. Use a timetable or revision planner to do this. Choose a mixture of a subject's topics to focus on each day to make sure you are spacing them out

3. **Review:** build in different revision techniques to help you do some quick 5-10 minute reviews of your topics throughout your revision plan - e.g. reading through notes, highlighting information, making post-it notes

4. **Transformation task:** these are 30 minute activities to help you take in information. For example, writing summary sheets, flash cards or mind maps for topics

5. **Practice testing:** test yourself on the area that you have reviewed such as with quizzes or by testing yourself with a friend

6. **Exam questions:** complete an exam question or questions on the area you have reviewed and mark this yourself, using a mark scheme

> *Five hours of time, spent in smaller chunks and spaced periodically, is a far more effective way to learn something than five hours spent the night before.*

Top tips to manage your revision time

1. Know what your **revision goals** are and **set aside blocks of time**
2. Don't work too much - **work smarter, not harder**
3. Establish **good habits** and a structured **revision routine**
4. **Don't procrastinate** - don't waste precious time worrying or thinking about what to do - **just do it!**
5. **Review** your work - **prompt your brain** with short review exercises

To commit something to memory, it takes time and repetition!

## Understanding the 'Interleaving' theory to help you revisit information

What is Interleaving?

Interleaving is a method to use when revising, to help you remember more for the exam and to understand it better as well. It is about what **you do with your time** when revising.

How does Interleaving work?

Learning is spread over time rather than in concentration on narrow topics one after the other.

Blocking vs Interleaving
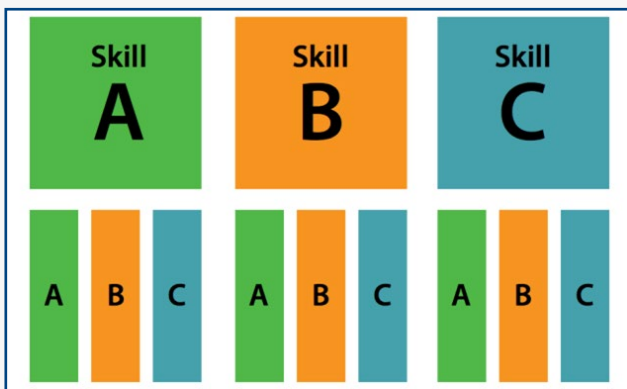
*Pan (2015) says **'Mixing it up boosts learning'** compared to more traditional methods of block learning where students master one topic before moving on to the next in preparation for exams.*

What are the benefits of Interleaving?

- Strengthens memory recall
- Your brain is continually changing focus and attempting to find different responses to bring into your short-term memory
- By revisiting material from each topic several times, in short bursts, you can increase the amount you remember in the exams
- Each time you revise information it strengthens your memory recall

How to apply Interleaving

1. Break units down into small chunks and split these over a few days rather than revising one whole topic all at once
2. Decide on the key topics you need to learn for each subject
3. Create a revision timetable to organise your time and space your learning

Focus on quality and not quantity - short targeted bursts are more effective.

Do little and often, and mix it up every day!