



TE KĀRETI TAMATĀNE O TE WHANGANUI-A-TARA

WELLINGTON COLLEGE

Founded 1867

KNOW YOUR BRAIN
UNLOCKING YOUR EXAM SUCCESS

KARAKIA



**Tau mai ko te mauri tū,
ko te mauri noho
Ko te mauri o Rangi,
ko te mauri o Papa
Ko te mauri aroha
Tau mai ko te mauri o lo
Ko te mauri o ngā tīpuna**

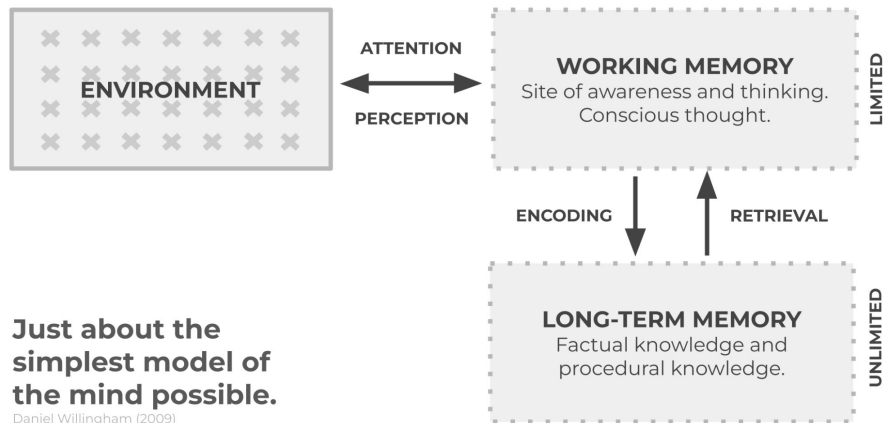
**UHI, WERO, TŪ MAI TE TOKI
HAUMI E! HUI E! Tāiki e!**

Why this?
Why now?

- Lots of work done for Externals in Term 1
- We know that students find it harder to achieve the same results in Externals than Internals
- We want to give you the tools to understand why, and help you to do things differently this year because...

Knowing how your brain works helps you to maximise its potential, **and that's a superpower.**

How does memory work?



**Just about the
simplest model of
the mind possible.**

Daniel Willingham (2009)

In order to think, we draw upon our environment (unlimited), working memory (limited) and long-term memory (unlimited)

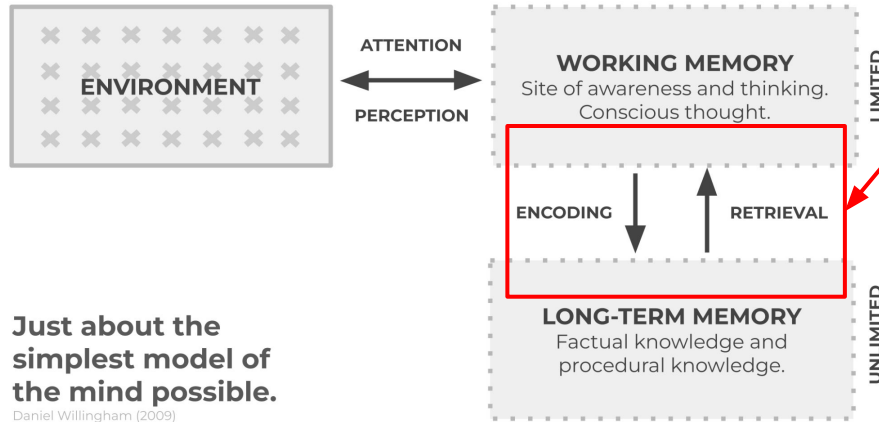
- Oliver Lovell, 2020



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How does memory work?



**Just about the
simplest model of
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Daniel Willingham (2009)

This is the secret
to success

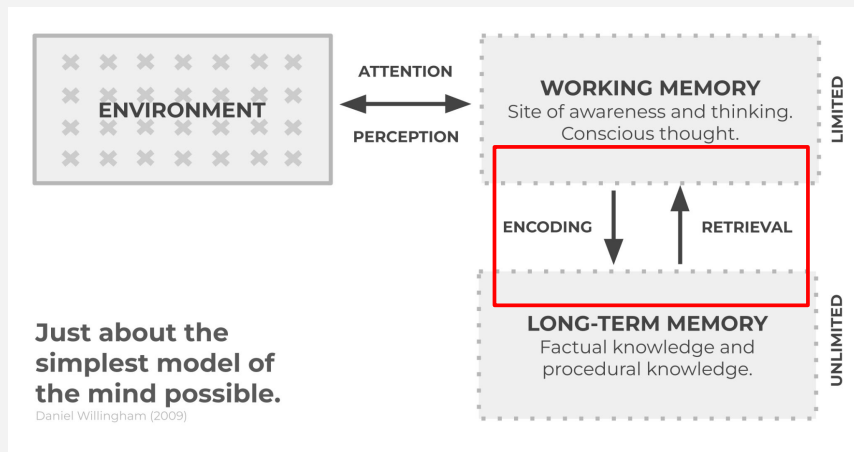
You need to be able to
retrieve both the
'what' and the 'how'
from your long term
memory on exam day.



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Why does this matter?



Learning is a change in long term memory.

We have only truly learned something once we are able to **retrieve it from our long term memory and use it** again at a later time.



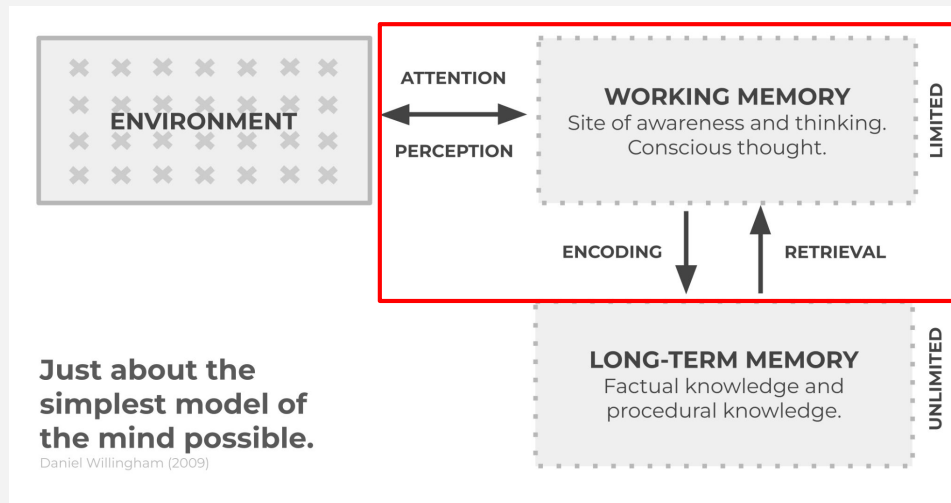
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How do we do this efficiently?

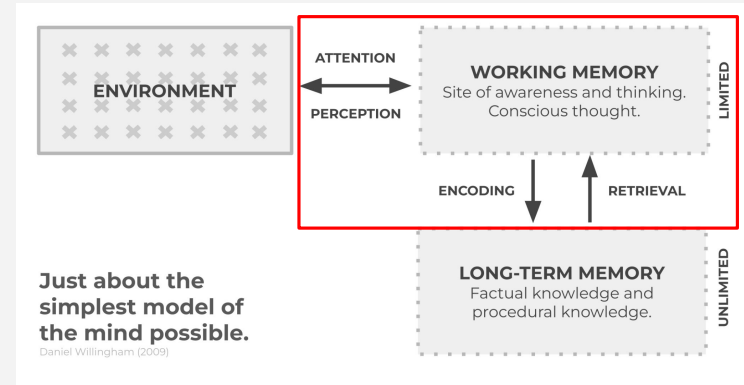
You need to manage two things:

- A) The load on your working memory
- B) Forgetting. Our brains are designed to forget.

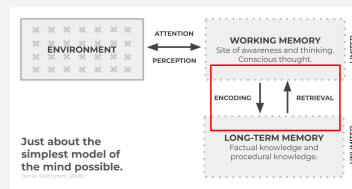


Managing your working memory (your cognitive load)

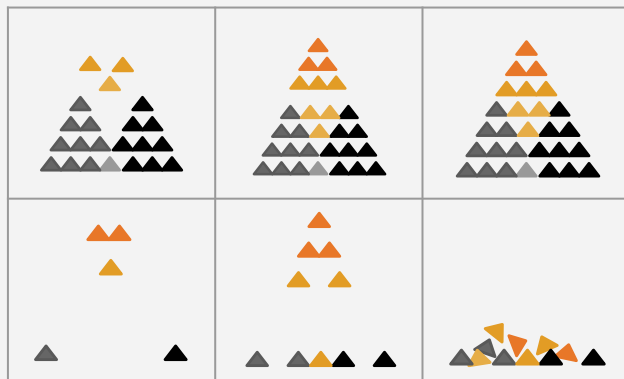
- **Cognitive Load Theory** is the idea that our working memory is *finite*, while our long-term memory is *infinite*.
- The brain pays **attention** to its environment.
- Approximately seven 'chunks' of information from the environment are held in working memory at any given time, where the brain can use it.
- **For learning to occur, we cannot exceed the capacity of working memory.** This is sometimes referred to as 'cognitive overload'. We do this by reducing 'distraction' and using tools such as chunking and retrieval.
- The size of a chunk varies greatly between a novice and an expert (because memory is sticky).
- **Multiple encounters with new information are needed for it to move to long-term memory.**



How do we do it? Through the process of encoding.



STRONG EXISTING
KNOWLEDGE



WEAK EXISTING
KNOWLEDGE

Memory is sticky.

The more memories you have on a topic, the easier it is to have more.

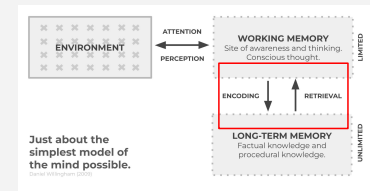
E.g. from *H* to *Hello*



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How you chunk the learning/ revision matters



Remember this:

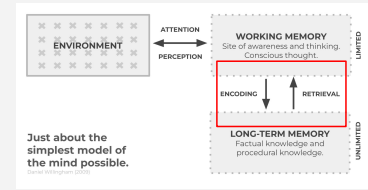
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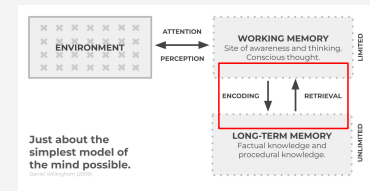
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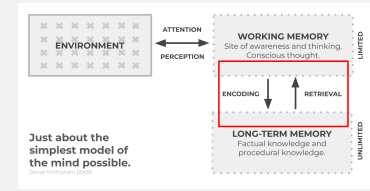
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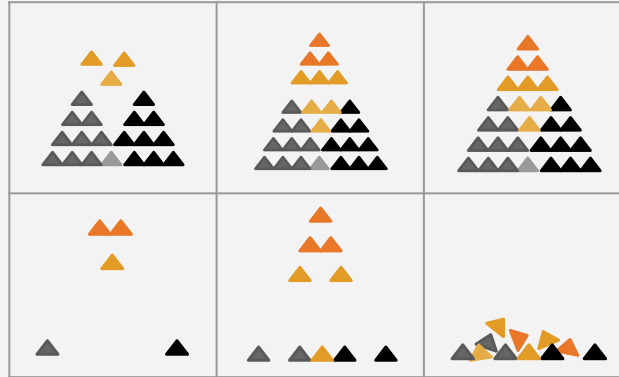
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How you chunk the learning/ revision matters



STRONG EXISTING KNOWLEDGE

WEAK EXISTING KNOWLEDGE



Remember this:

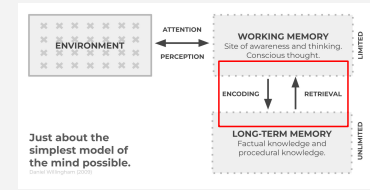
L A W R E N C E 1 2 3 4 5 6 7 8



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Paying attention matters for memory



We can think of attention as **‘the spotlight of the mind’**.



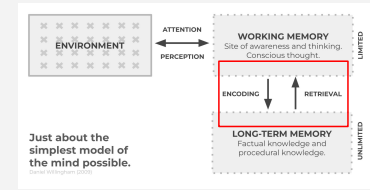
- When we focus on a particular thing, our brain is able to ‘filter’ everything else (give everything else less processing). **Without attention, information is essentially ‘invisible’ to the brain.**
- **Multitasking is a myth.** Instead, everytime we switch tasks, we suffer ‘switch cost’ as a result of the shift in attention. The brain must use extra working memory to re-establish the ‘thread’ of thinking each time it ‘switches’.
- **Distraction leads to cognitive overload.** We only learn what we pay attention to.



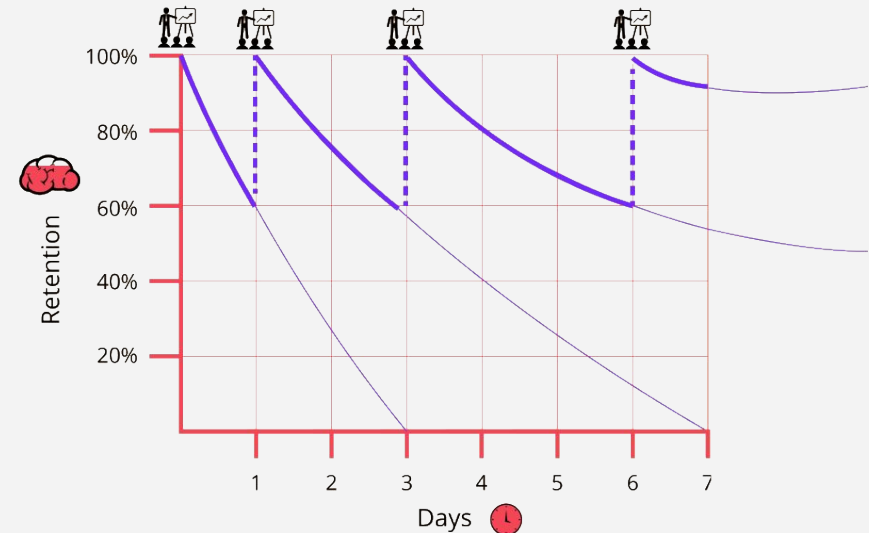
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Moving from working to long term memory: The impact of forgetting



- **Rapid Initial Decay:** We lose around 50% of new information within an hour of learning it, and up to 70% within 24 hours.
- **The ‘Savings’ Effect:** While it appears as if learning has been forgotten, the brain does retain a ‘trace’. This means that ‘re-learning’ the material becomes significantly faster.
- **The Power of Spaced Repetition:** Retention of information increases when revisited at increasing intervals (e.g. one day, one week, one month).
- **Flattening the Curve:** Each time you retrieve information, the rate of forgetting slows.



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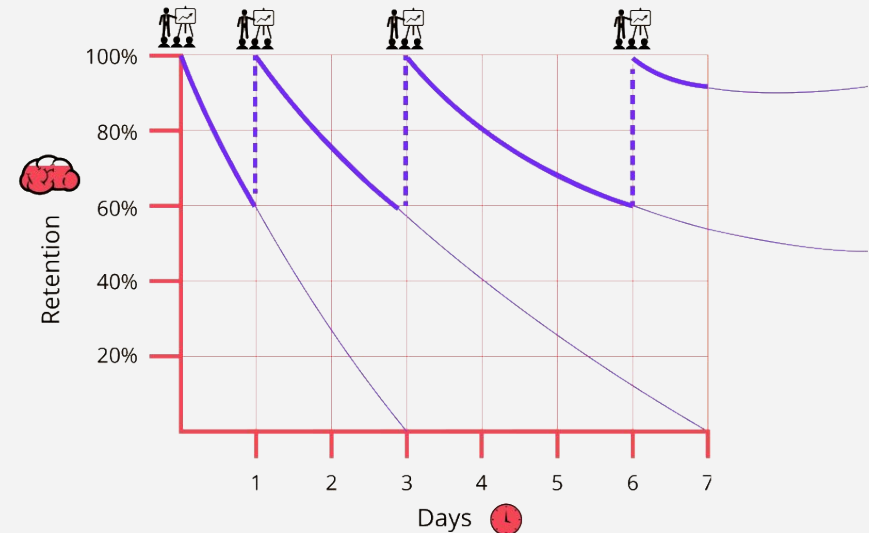
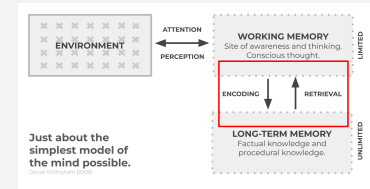
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Memory is not a library - it is reconstructive

- Every time you retrieve a memory, you are changing it.

E.g. story telling, everytime you tell the story it is a little more polished, and each new time will be closer to the time before, rather than the original, moving further and further away from where the story began.

- This matters in regards to learning, because everytime we retrieve information we are able to make it 'more polished', but we also have to be sure we aren't reinforcing misconceptions/misunderstandings.



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The takeaways

- In order to be ready for your exams, you need to **learn both the what and how** for each of your subjects
- You can only do this by **moving knowledge from working to long term memory**
- To do this, you need to **manage your cognitive load**, and **overcome forgetting**
- You do this by **chunking your learning** and **spreading it across time**
- **Cramming will fail you**, it's just not how the brain works

KARAKIA



E oha ki runga
E oha ki raro
Āna

*"I greet those things from above
I greet those things from below
Yes I do"*