

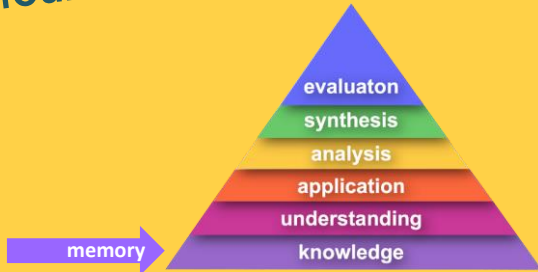
Memory In and Out



What Teachers
(and Learners)
Need to Know
about Encoding
and Retrieval

1

Memory is the
foundation of learning.

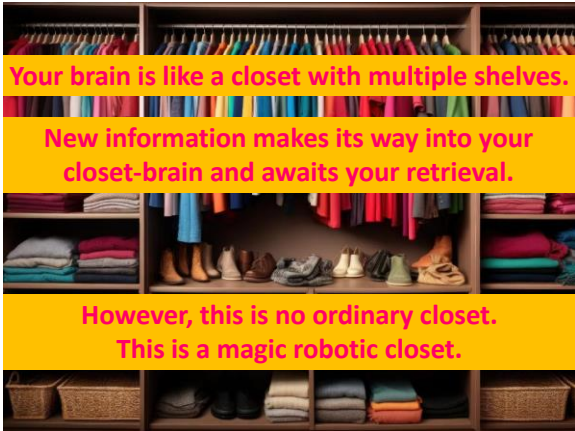


2

Memory is the
foundation of learning.

Successful learning involves
encoding and retrieval:
memory in and memory out.

3



4



5

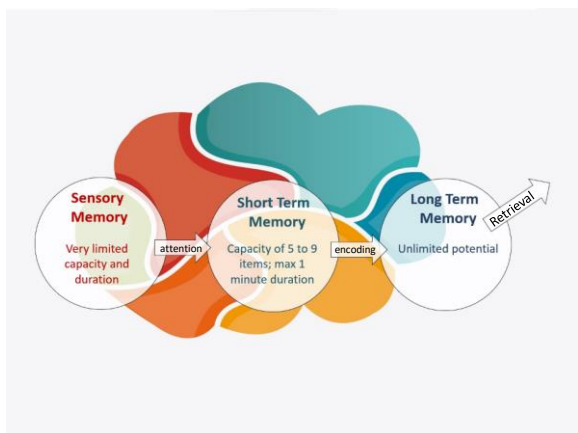


6

Types of Memory

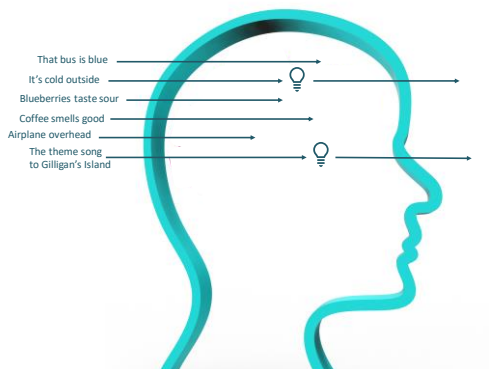


7



8

Sensory Memory: It all starts here.



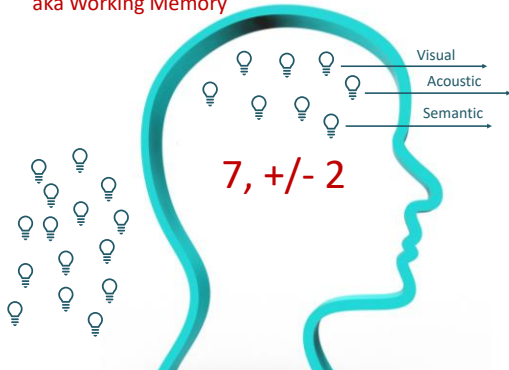
9

Short-term Memory: Limited Duration aka Working Memory



10

Short-term Memory: Limited Capacity aka Working Memory



11

Long-term Memory: The Closet



12

Long Term Memory



13

Long Term Memory



Explicit
(Declarative)
(Conscious Awareness)



Implicit
(Non-declarative)
(Unconscious Awareness)

Episodic
(Experiences)

Semantic
(Knowledge and concepts)

Procedural
(Skills and actions)

Emotional Conditioning

14

Long Term Memory



Explicit
(Declarative)
(Conscious Awareness)



Depends upon encoding and retrieval

Episodic
(Experiences)

Semantic
(Knowledge and concepts)

15

Encoding



16

Encoding is the process
of getting incoming
information into memory.

Filling the shelves

17

Information is encoded
three ways:

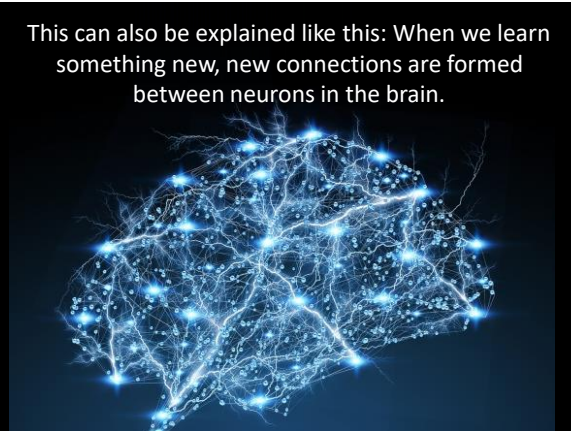
Visual
Acoustic
Semantic

18

Information is encoded
three ways:
Visual
Acoustic
Semantic

19

This can also be explained like this: When we learn something new, new connections are formed between neurons in the brain.



20

These connections are reinforced every time the material is encountered...but paths that remain unused begin to fade away....

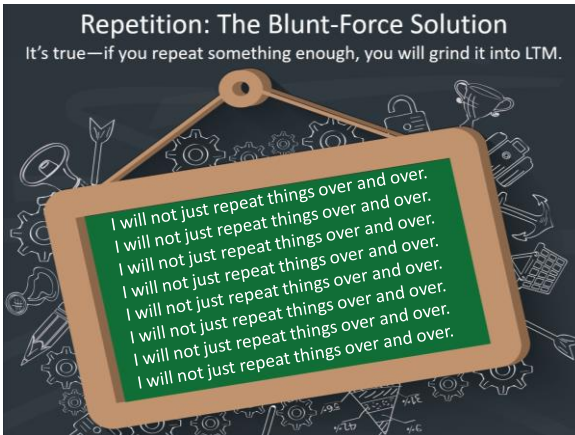


21

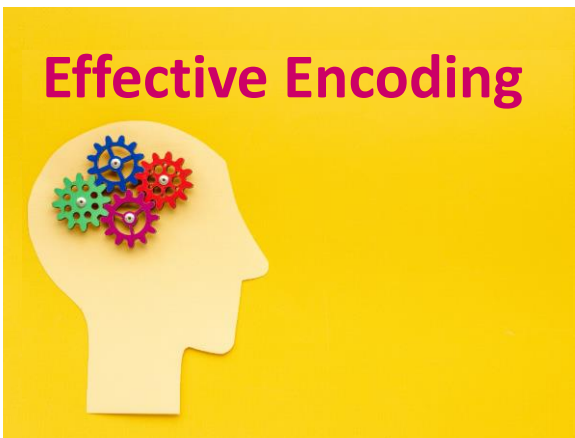
*To encode something on
your memory*

*Repetition is
almost always necessary*

22



23



24

How do we reinforce information without resorting to the grind?

JUST ABOUT ANYTHING
is better than
read, reread, repeat.

25



26

Read, attend lectures, watch videos, and...



PASSIVE

- Speak: read aloud
- Write: take summary notes
- Summarize in your own words out loud
- Create a shrinking outline
- Create cloze exercises
- Storytelling (describe the context)
- Plan a trip (whether you take it or not)
- Make your own flashcards
- Draw your own maps
- Create/draw your own diagrams
- USE the information in some way



ACTIVE



ACTIVE



ACTIVE



ACTIVE

27

Get Meta...Metacognition



Before reading, consider:

- What do I already know?
 - Link to prior knowledge/activate your schema
- What do I need to know?
 - Create engagement/dramatic tension

After studying:

- What is clear as day?
- What is clear as mud?
- Make a list: top 5 things I learned today
- Make a list: top ten facts to know about _____

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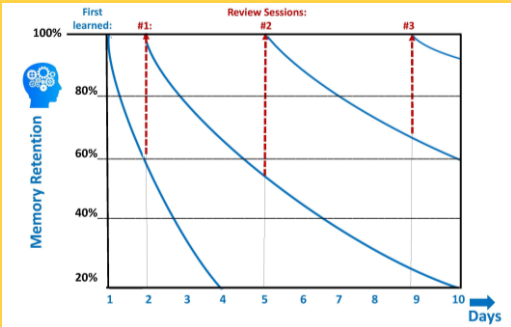
For a more information on these (and other) **active study techniques**, please see the "For Further Learning" slide at the end of your handout!

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30

Use Spaced Repetition to Conquer the Curve of Forgetting!



31

Retrieval



32

Retrieval is the process
of getting information
out of your memory

...from storage to recall

33

Use it or lose it.



Practice
active
recall!

34

Active recall is a study technique that involves retrieving content from your memory—*practicing the skill of retrieving and using knowledge.*

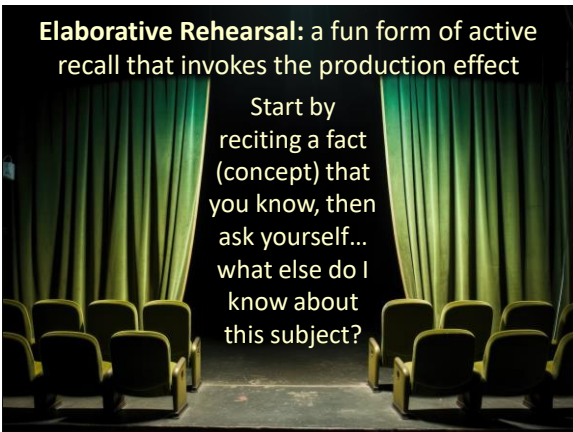
No peeking, no lists, no notes—close your eyes and flex your brain.



35

Elaborative Rehearsal: a fun form of active recall that invokes the production effect

Start by reciting a fact (concept) that you know, then ask yourself... what else do I know about this subject?



36

**Active Recall
+
Spaced
Repetition
=
Retrieval
Magic!**



37

Let's Review!



38

**What are the three stages
of memory?**



39

What is considered to be the capacity of (items in) STM?



40

What are the two main types of LTM (having to do with states of awareness)??



41

What type of explicit memory involves real-life experiences?



42

What type of explicit memory involves knowledge and concepts?



43

The process of moving new information into LTM is known as _____.



44

Information is encoded three different ways:



45

To encode something on your LTM, _____ is almost always necessary.



46

_____ is a study technique that involves practicing the skill of retrieving content from your memory.



47

A study technique known as _____ can help with the inevitable "curve of forgetting" that evolves over time.



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References

- Craik, Fergus and Jacoby, Larry. *Memory (The MIT Press Essential Knowledge Series)*. Cambridge: MIT Press, 2023.
- Dirksen, Julie. *Design for How People Learn*. Berkeley, California: New Riders Publishers, 2012.
- Edutopia: <https://www.edutopia.org/article/what-do-teachers-need-know-about-memory>
- The Peak Performance Center: <https://thepeakperformancecenter.com/educational-learning>
- Simply Psychology: <https://www.simplypsychology.org/declarative-memory.html>
- The Learning Scientist Blog: <https://www.learningscientists.org/blog/2016/7/7-1>
- Psych Learning Curve: <https://psychlearningcurve.org/what-every-teacher-and-student-needs-to-know-about-memory/>



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For Further Learning/Active Study Techniques

- *Break out the Books*-presented by Jane Nickles. Recorded webinar available on the membership portal of the SWE website.
- Spaced Repetition: <https://bubblyprofessor.com/2020/02/19/spaced-repetition-conquer-the-curve-of-forgetting/>
- Active Recall: <https://bubblyprofessor.com/2020/01/30/use-it-or-lose-it-active-recall-for-wine-and-spirits-students/>
- Shrinking Outline/Cloze Exercises: <https://bubblyprofessor.com/2021/02/07/spotlight-re-write-tips-for-transforming-your-mangled-messy-notes-into-an-awesome-study-tool/>
- The Production Effect: <https://bubblyprofessor.com/2018/11/09/un-study-techniques-say-it-scream-it-sing-it/>
- Plan a Trip: <https://bubblyprofessor.com/2018/08/08/how-to-succeed-at-wine-studies-without-really-trying-part-one/>



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Memory In and Out



Thank you for
joining us!

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