Teaching for Learner Variability:

Supporting Neurodiverse Learners in Extension Settings

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As you enter the room

Answer questions on the sticky note

I learn best when…



I struggle teaching learners who…



Never Assume

Never Ask

Provide Resources for ALL

Objectives

- Recognize common learning needs that may be experienced by neurodiverse learners.
- Identify barriers within Extension learning environments that may limit participation and learning.
- Modify instruction, activities, and learning environments using practical inclusive teaching strategies.

1 Why Neurodiversity Matters

You tell me.

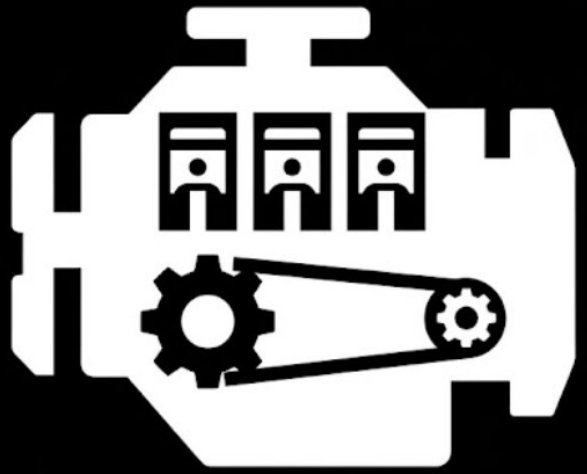
When a flower doesn’t bloom, you fix the environment in which it grows, not the flower.

- **-Alexander Den Heijer**



Medical Model

Illness or pathology to be cured



Critical disability Model

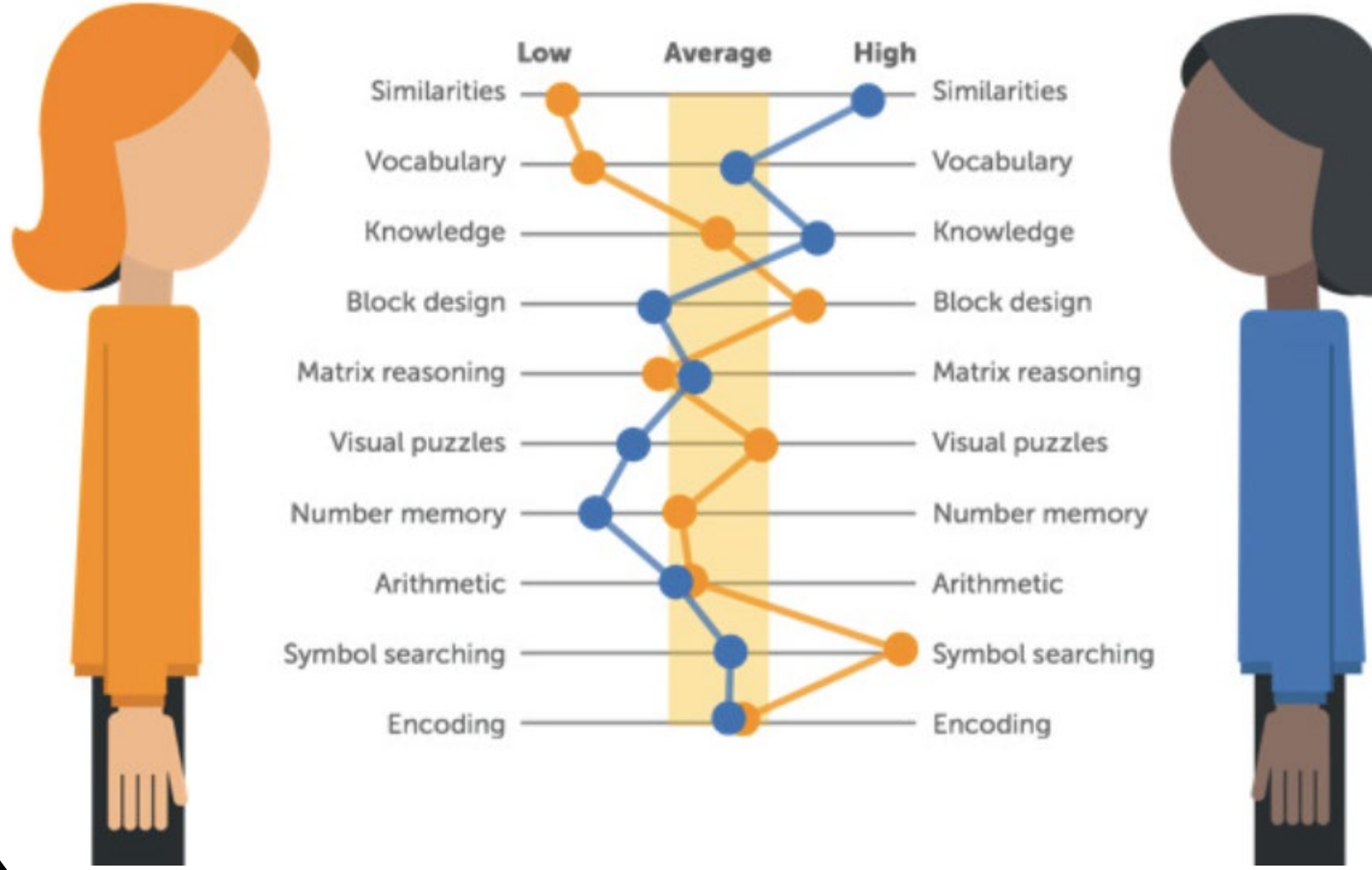
Mismatch with environment



https://digitalpromise.org/wp-content/uploads/2019/01/Jagged-Profile.jpg

Normal does not exist:

Jagged Learning Profiles



Diagnosis

Is **not** necessary to improve instruction

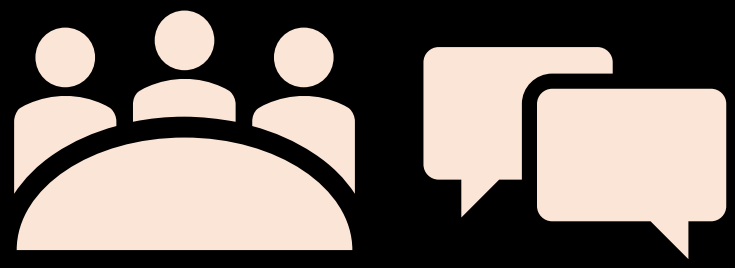


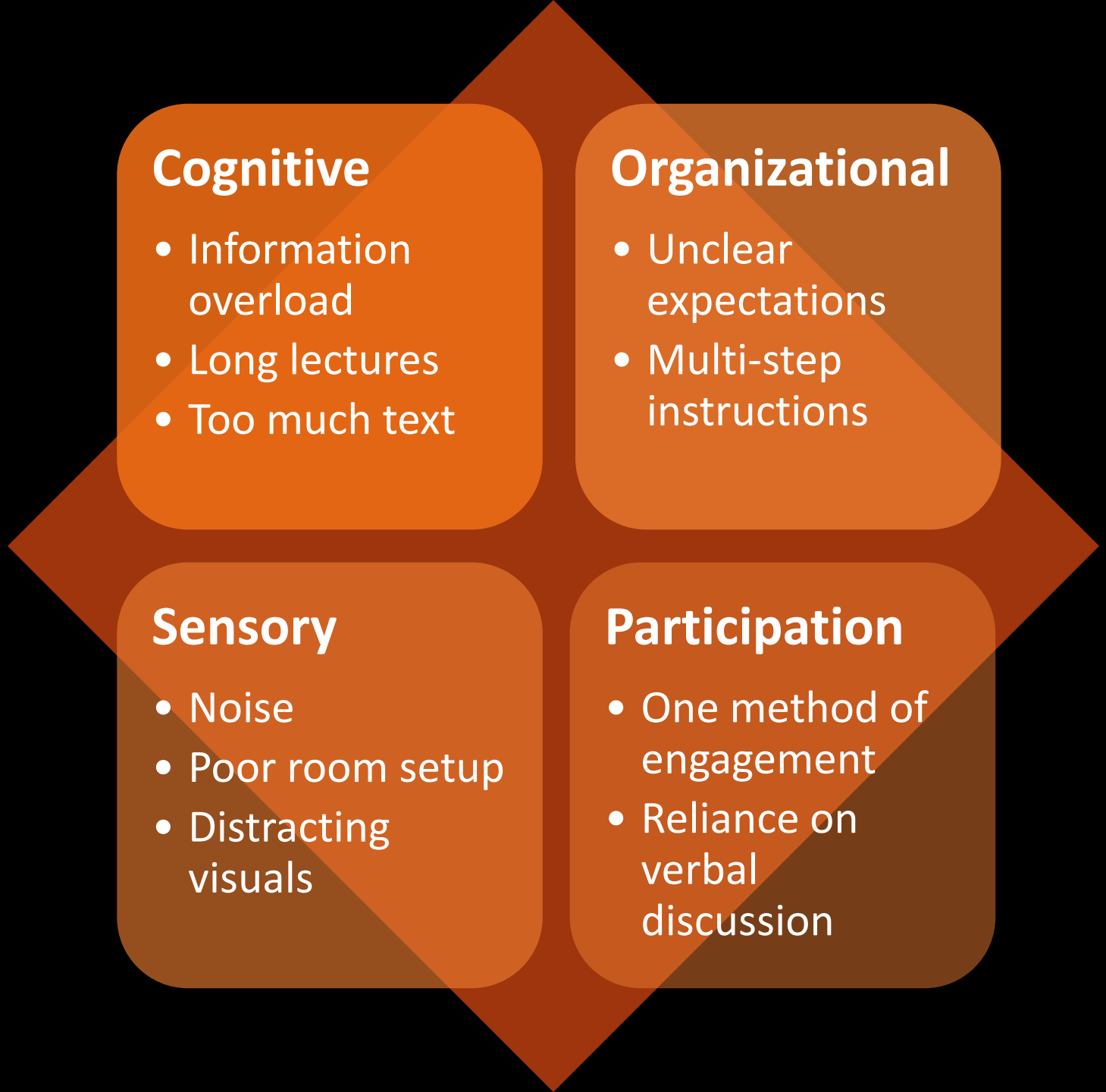
2 Learner Needs

What learner experiences have you witnessed?

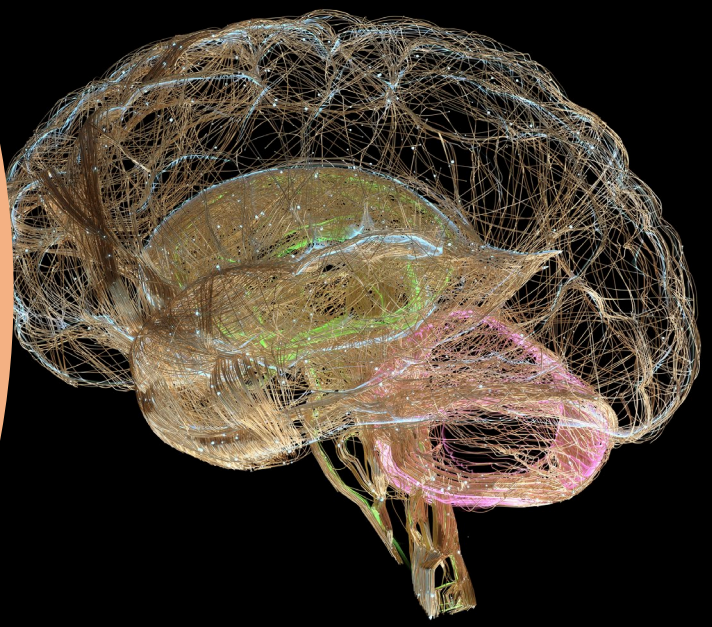
Learner Need	What it may look like
Sustaining attention	Fidgeting, multitasking, losing track, not listening, looking out window or on phone.

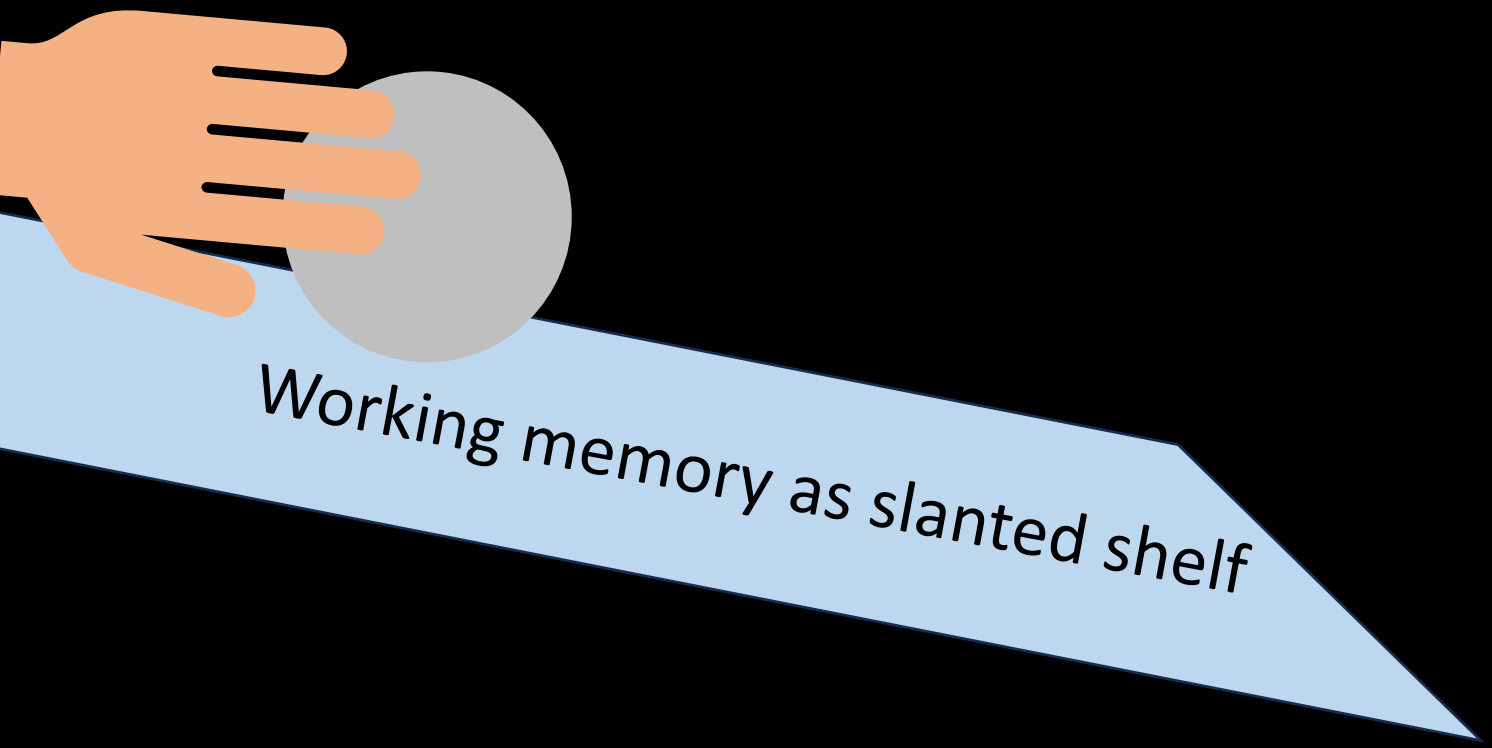
Star 3 your group agrees they see the most.




Cognitive
• Information overload
• Long lectures
• Too much text
Organizational
• Unclear expectations
• Multi-step instructions
Sensory
• Noise
• Poor room setup
• Distracting visuals
Participation
• One method of engagement
• Reliance on verbal discussion

3 Memory




Working memory as slanted shelf

Working memory

"Indexing" to long term memory

3-5 chunks of info

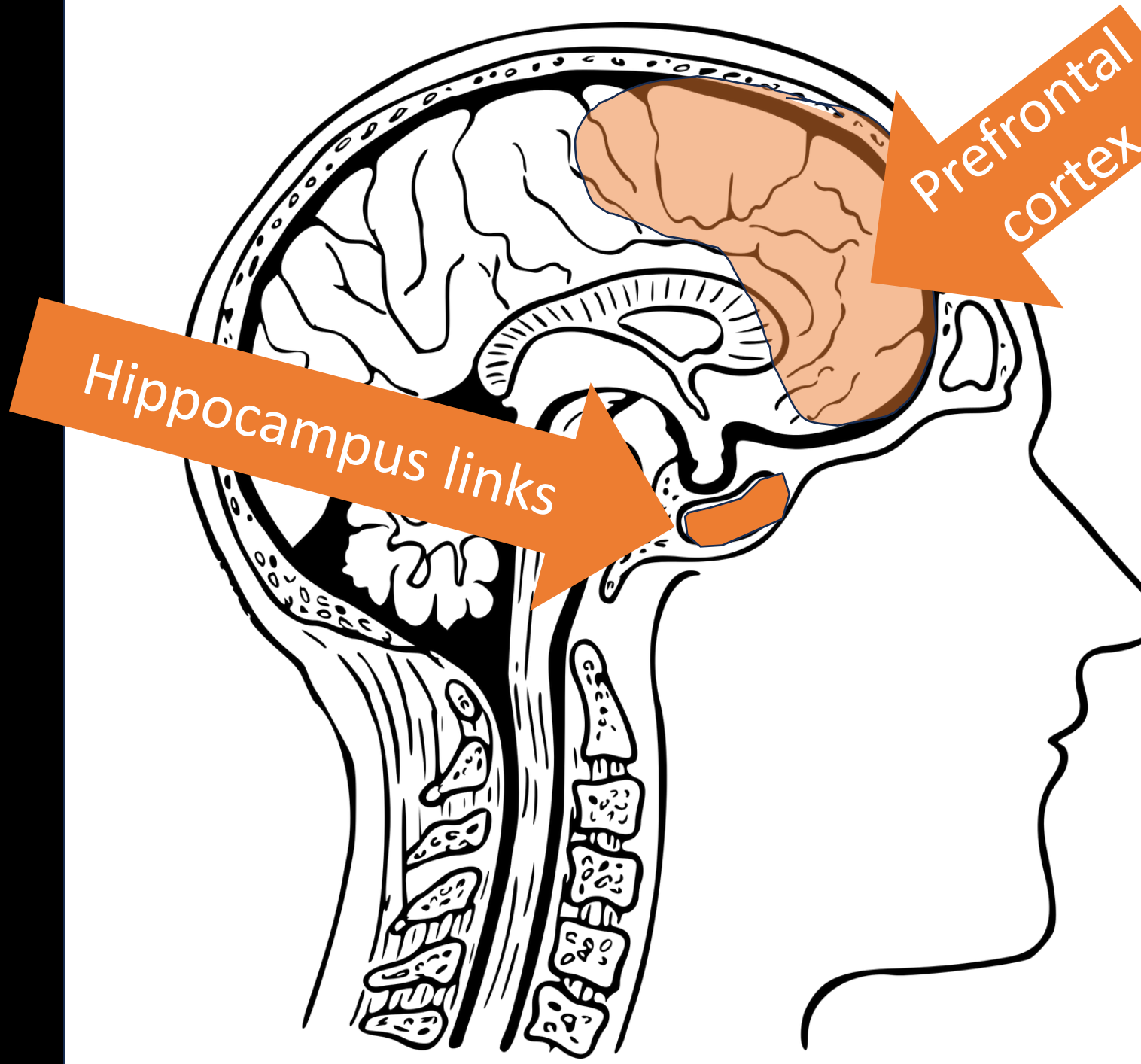


Image by OpenClipart-Vectors from Pixabay



Image generated 10.22.24 by DALE-E AI

Long-term memory

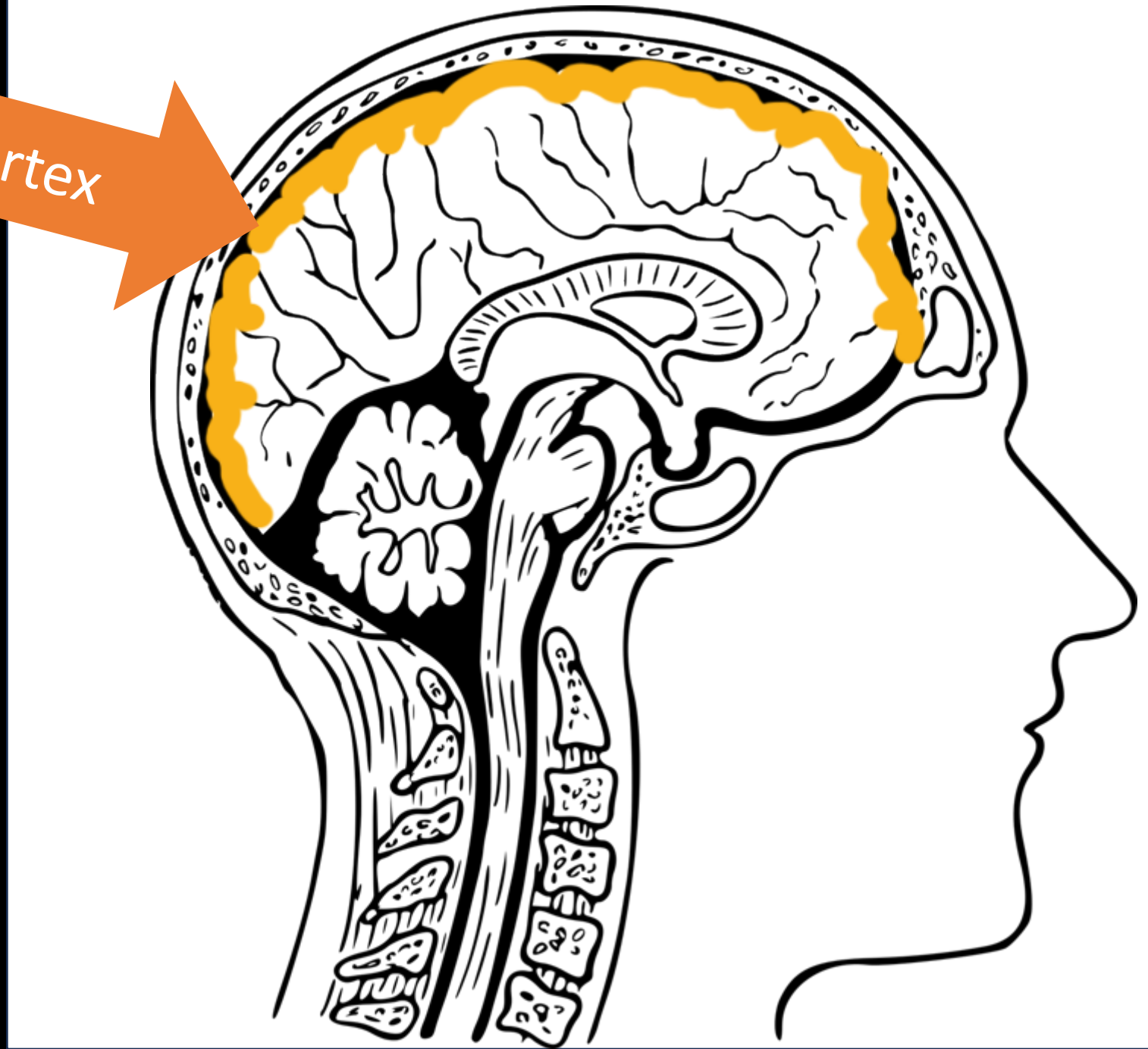
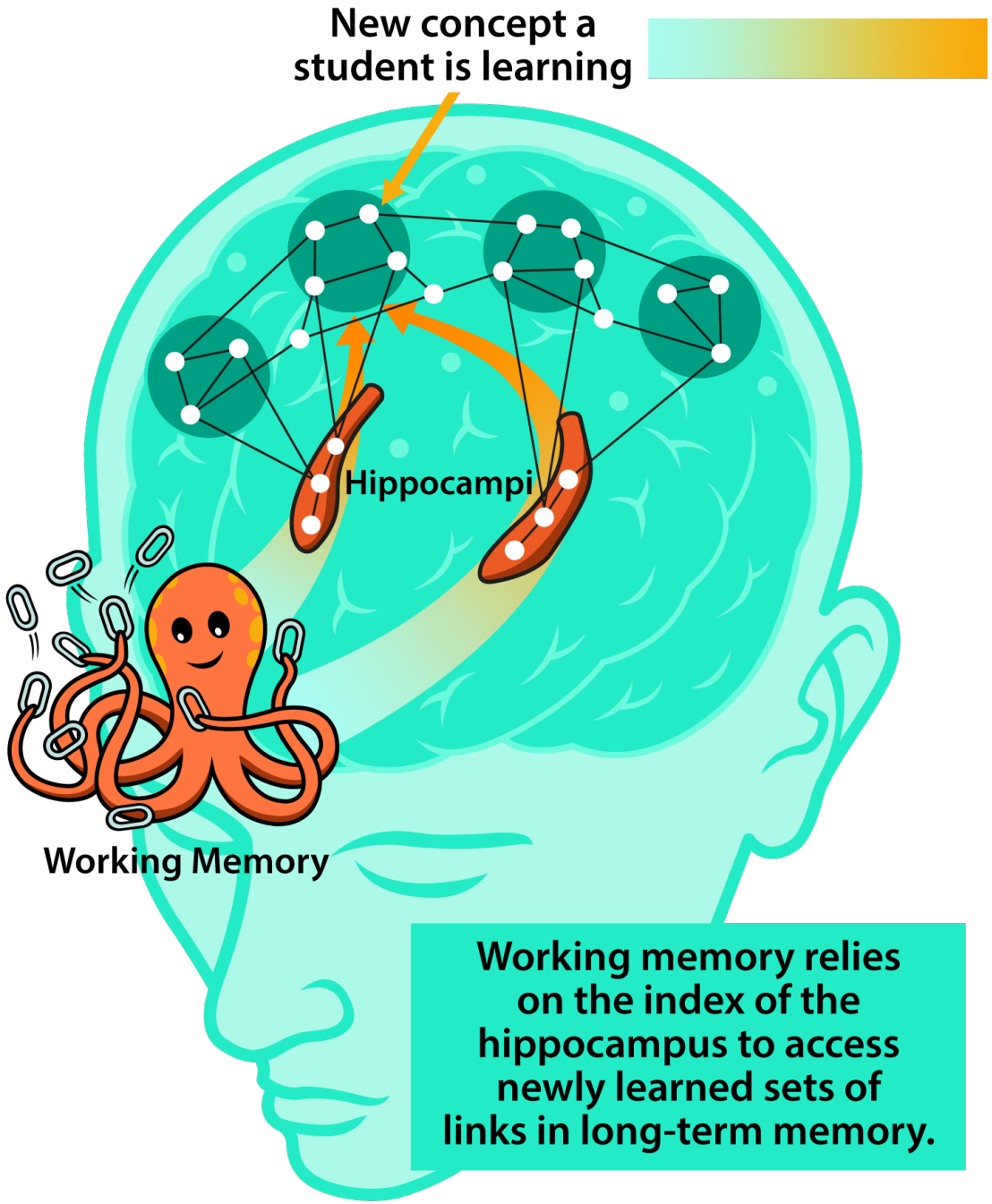


Image by OpenClipart-Vectors from Pixabay



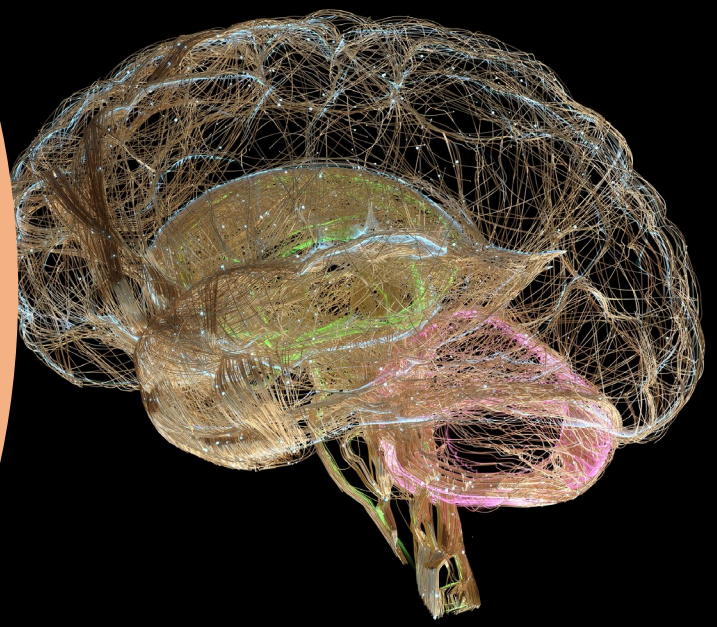
Damage to hippocampus

- Impacts recent memories

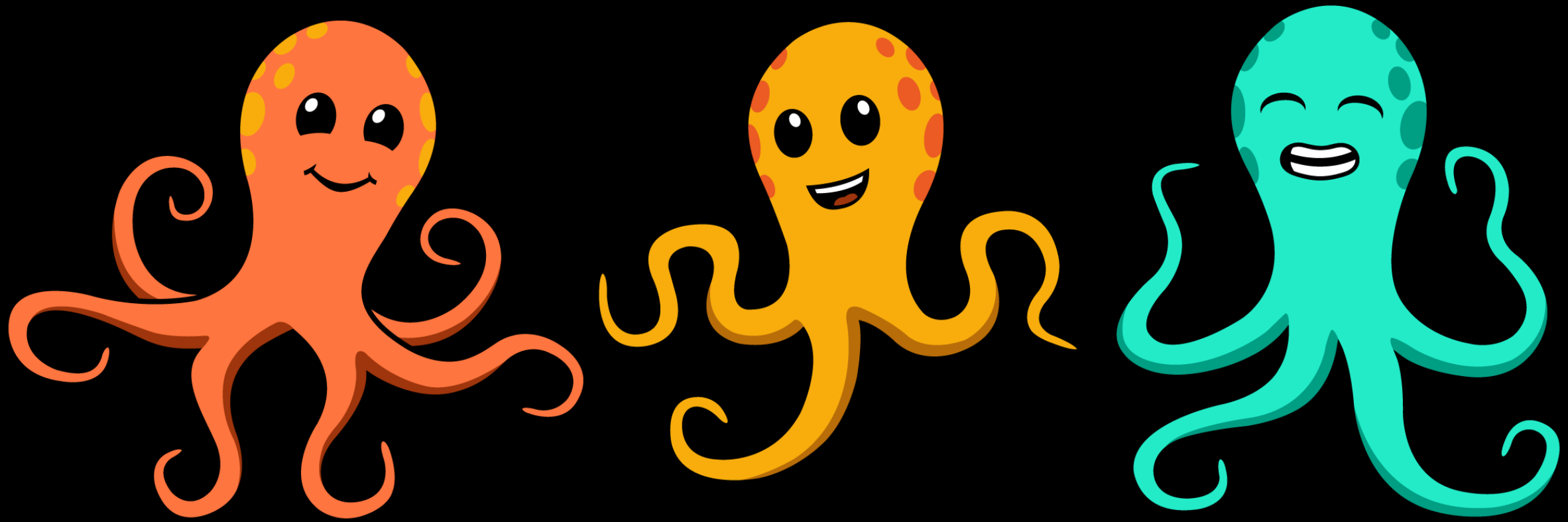
Depression

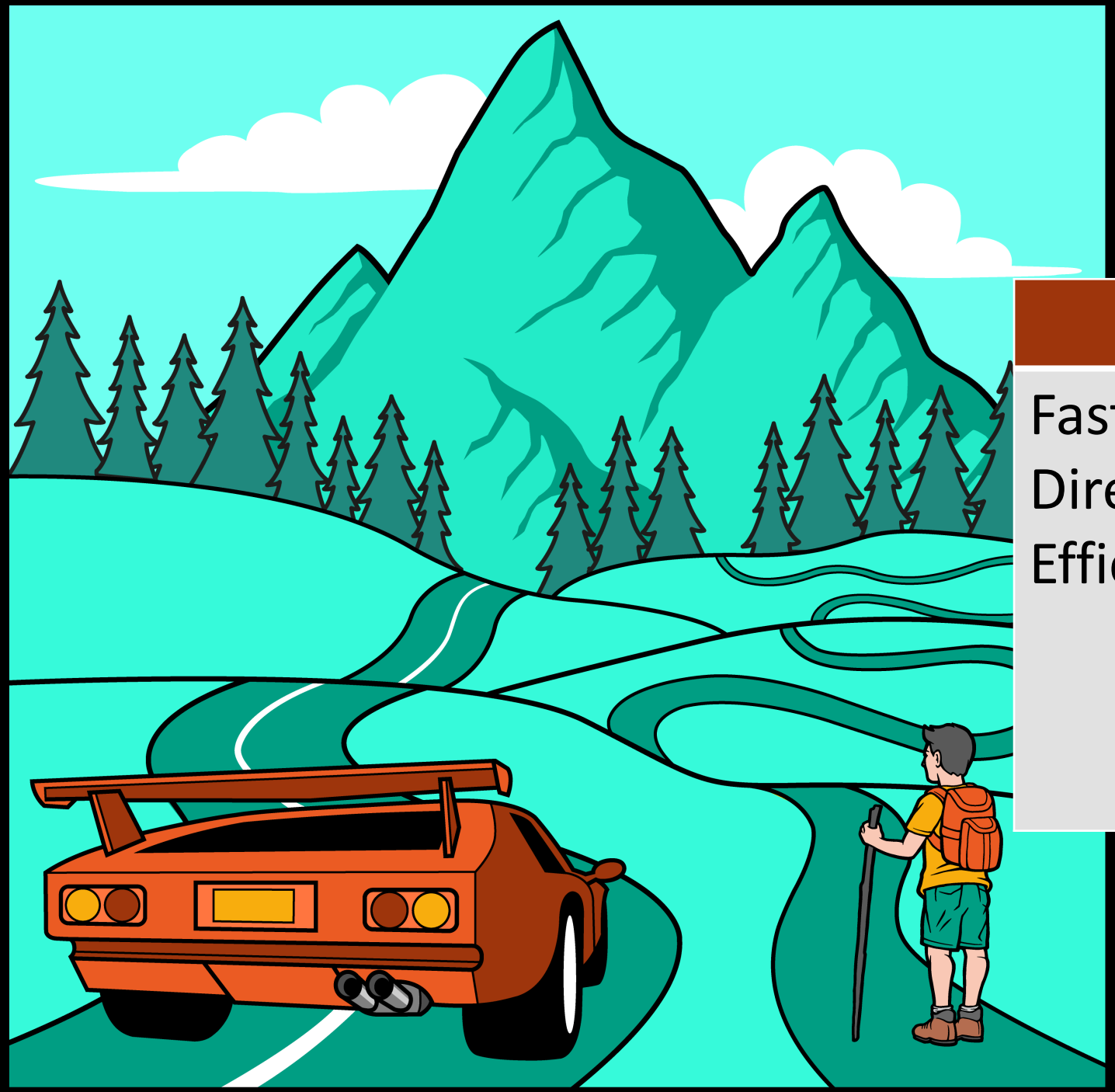
- Atrophy of hippocampus → Memory issues

4 Neurodiversity & Memory



Neurodiversity of Working Memory

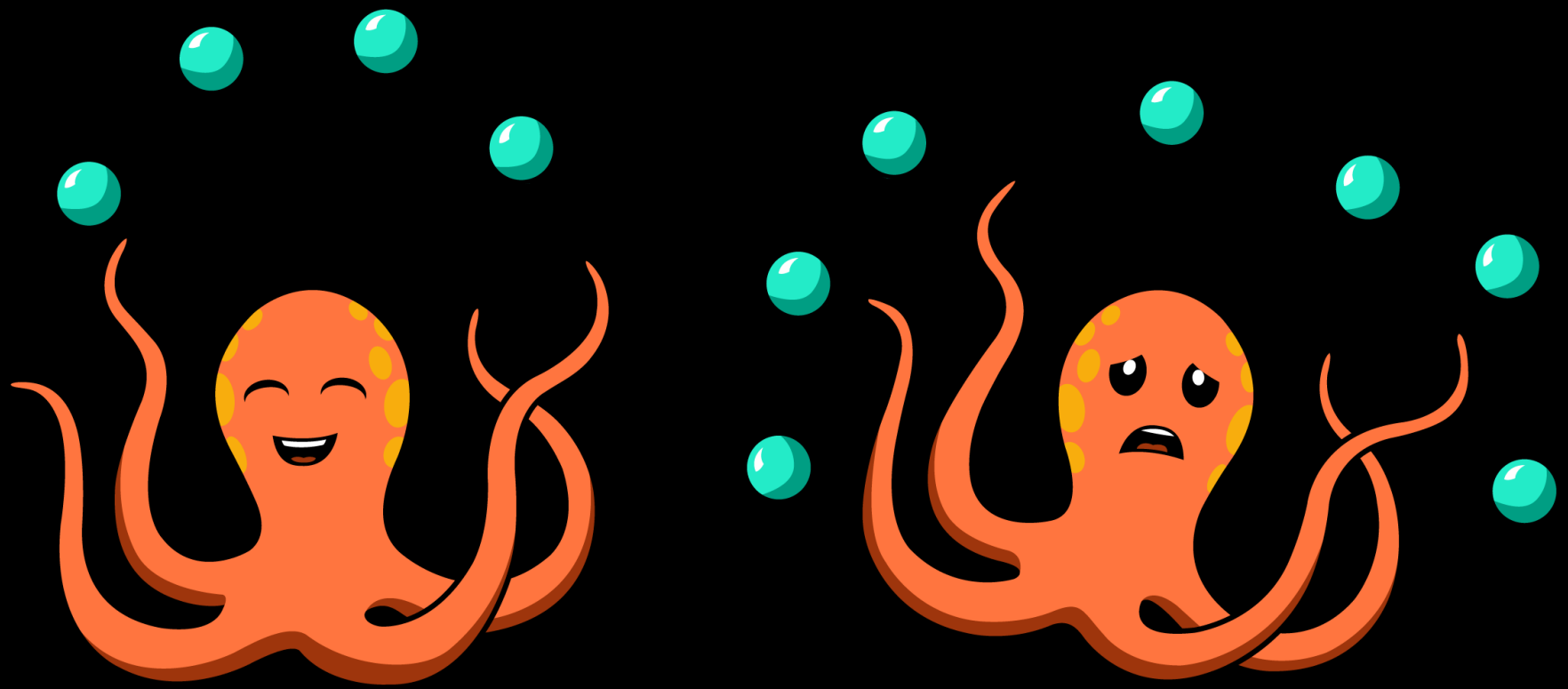




Neurodiversity of Working Memory

Race Car	Hiker
Fast Direct Efficient	Notices details Creative thinking & questioning Flexibility

Cognitive load

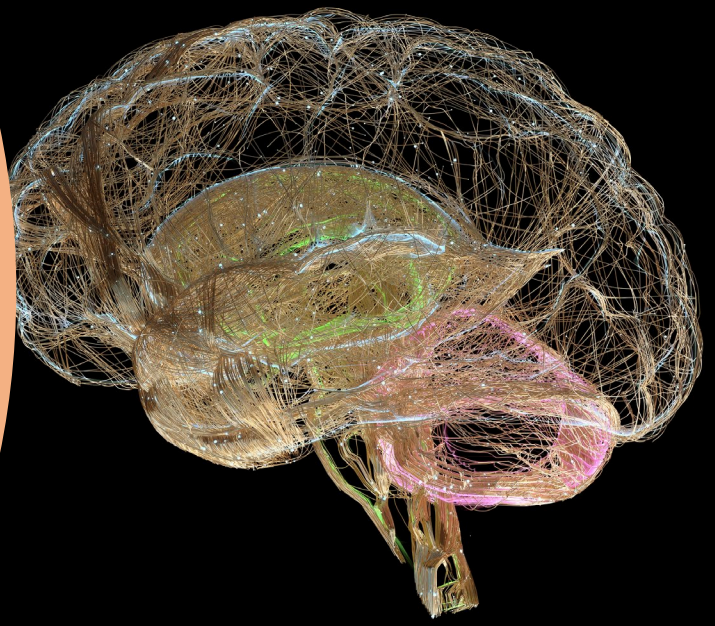


Too much going on!

Which do teachers have the MOST/LEAST control over?

Prior knowledge Nature of task	*Intrinsic (task complexity)*
Fluff Language use Presentation mode	*Extraneous* (unneeded info)
Reflecting on learning Metacognition Linking to the known	*Germane* (learning processes)

5 Helping students remember

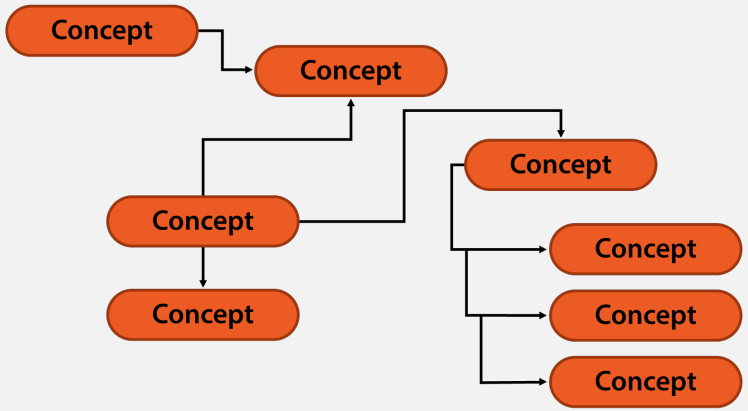


Reread

Highlight or underline

Recall (Retrieval practice)

Create a concept map

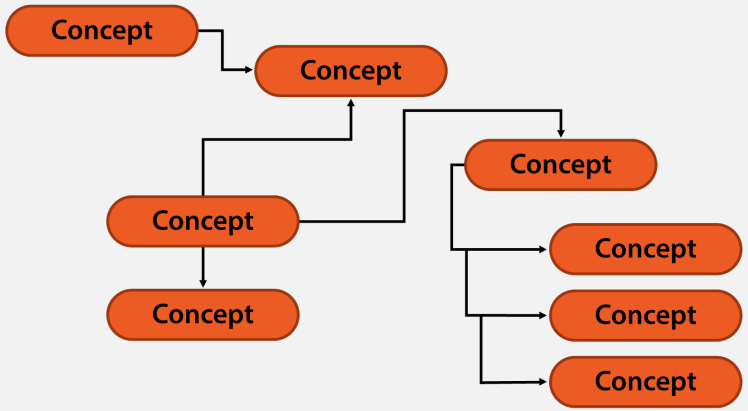


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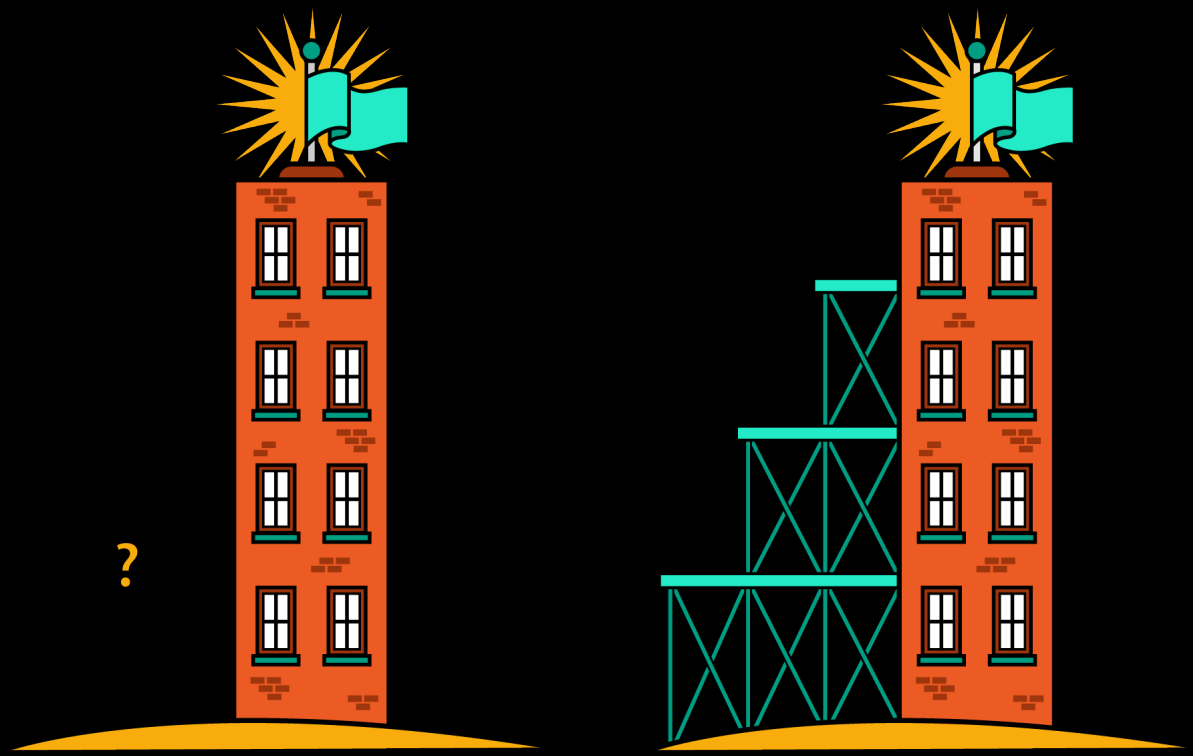
Recall (Retrieval practice)

Create a concept map



Background Knowledge

Ex: 3x-5=25

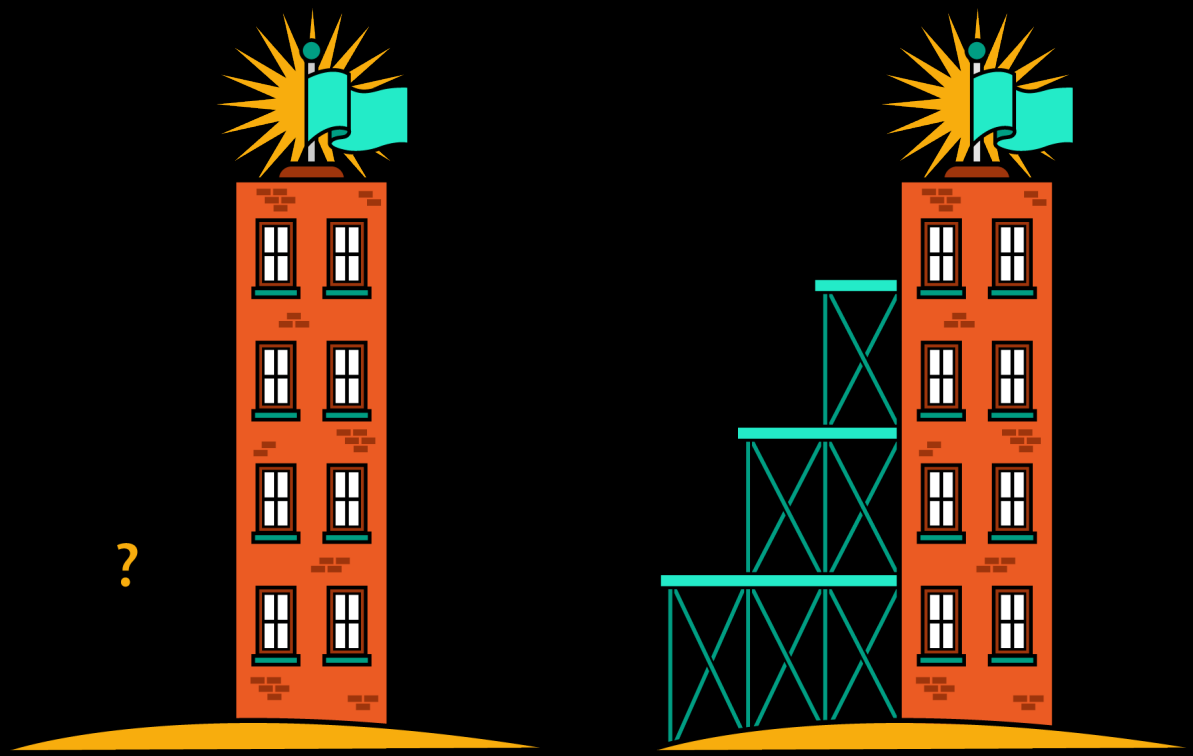


Background Knowledge

Ex: 3x-5=25

(3*8)-5=21

(3*10)-5=25

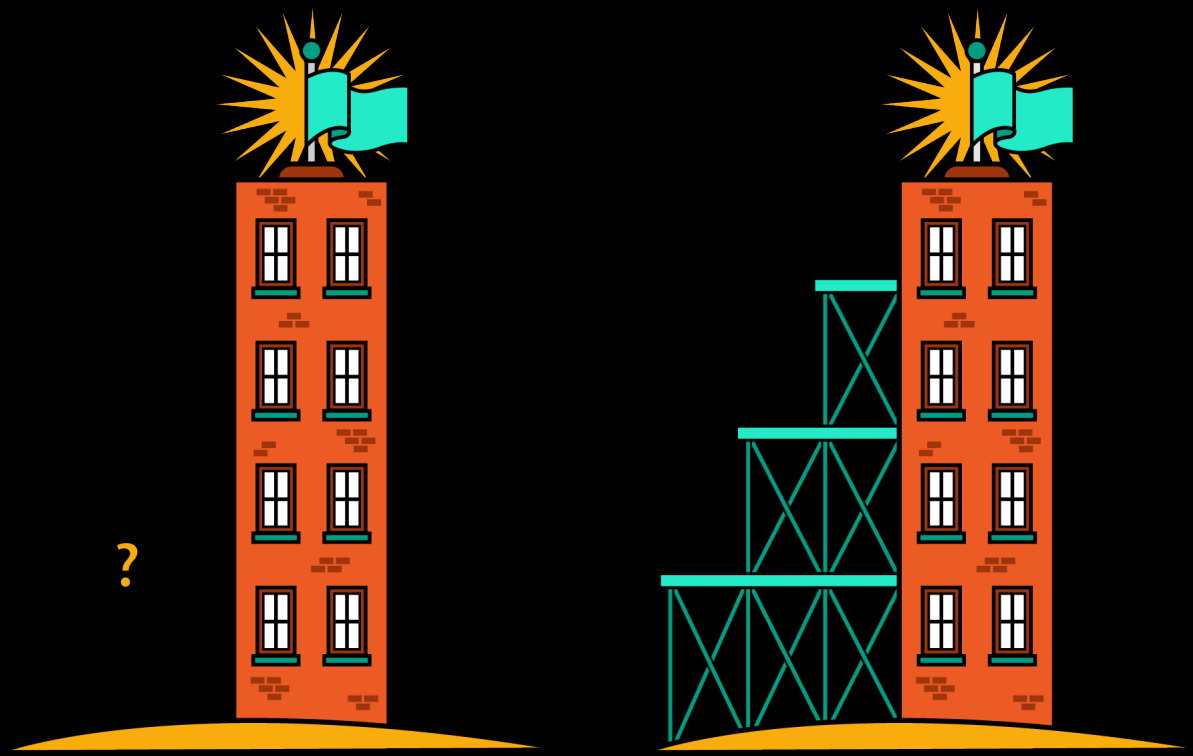


Background Knowledge

Ex: 3x-5=25

3x=30

X=10





When is your memory failing you?

When is it sharp?

“Ready to Learn” States



- Metacognition
- Need to know / Importance
- Mindfulness
- Positive emotional state

Presenting Information: What way is best?

Blocking

$A_1A_2A_3B_1B_2B_3C_1C_2C_3$



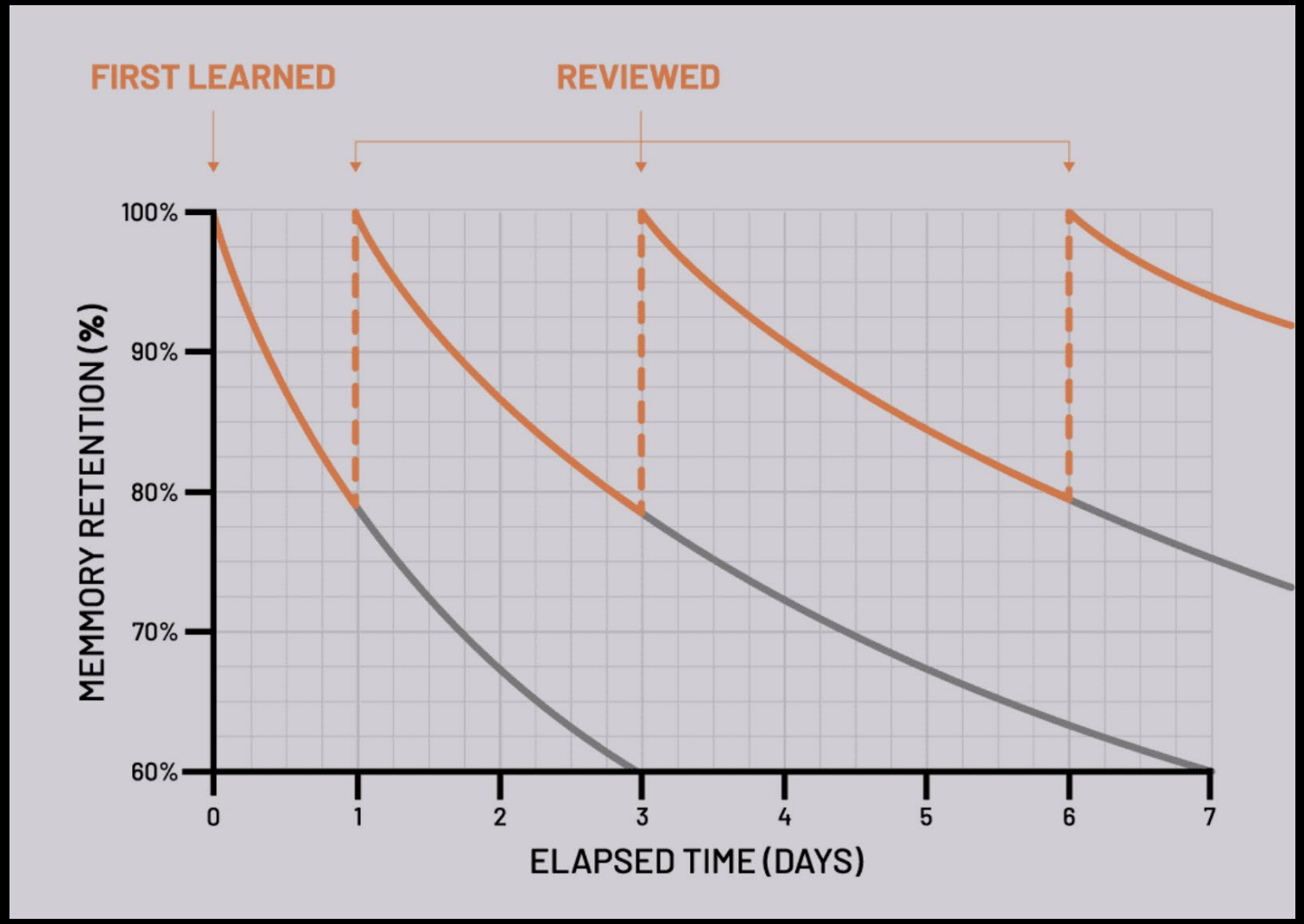
Interleaving

“$A_1B_1C_1A_2B_2C_2A_3B_3C_3$



(Samani & Pan, 2021)

Spaced Repetition



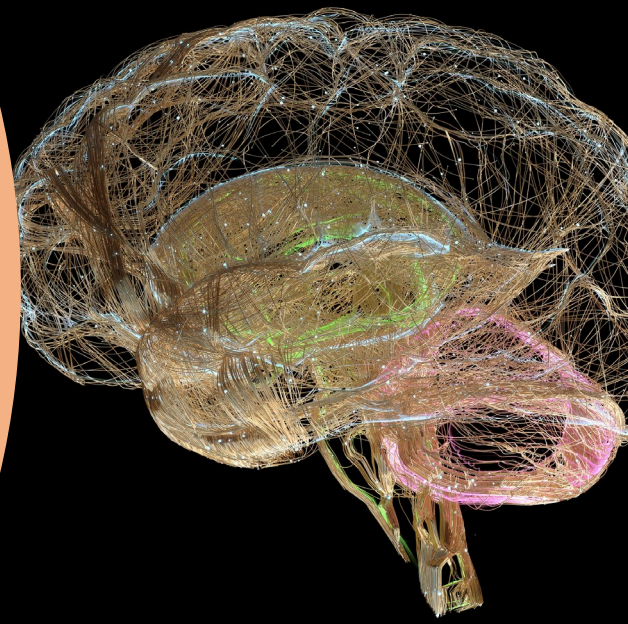
https://www.lifehack.org/851026/spaced-repetition

Gradually decreasing the frequency of review.

- Space - Spaced Repetition
- Spaced learning app
- FluentU
- SuperMemo
- Memoo - Spaced Repetit...
- AnkiDroid Flashcards

6

Learners with Less Working Memory



Learners with Less Working Memory

Ideas?

Learners with Less Working Memory

- Routines
- Clear instructions (one step at a time / written)
- Connect new with known
- Spelling / definitions in advance
- Partial outlines
- Wait time / processing time
- Frequent breaks with retrieval exercises
  - Teach content
  - Ask learners to pause and write main ideas

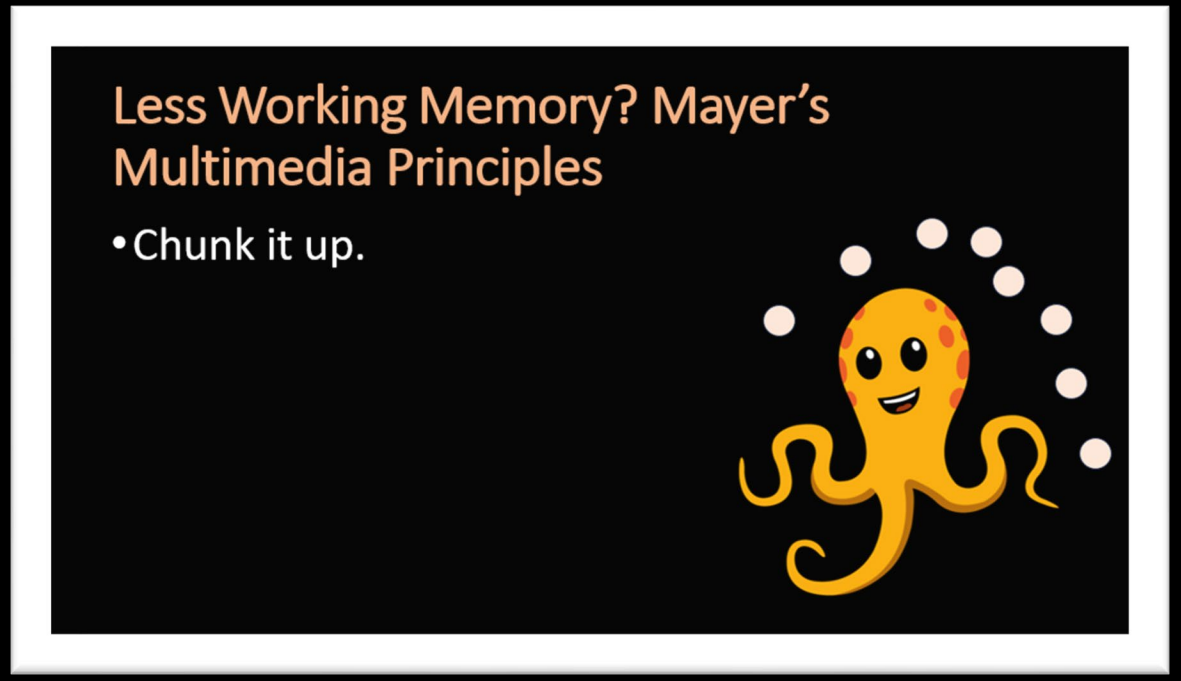
Less Working Memory? Mayer's Multimedia Principles

- Chunk it up.



Less Working Memory? Mayer's Multimedia Principles

- Chunk it up.
- Hear words. See images.



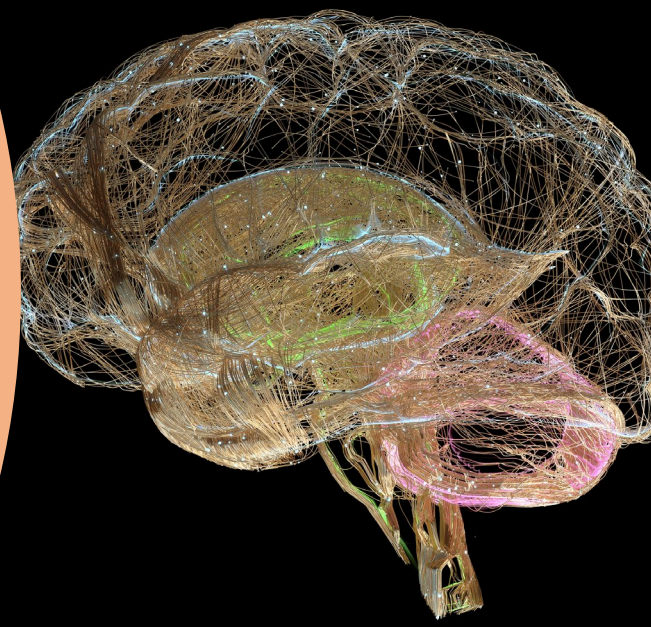
Less Working Memory? Mayer's Multimedia Principles

- Chunk it up.
- Hear words. See images.
- Eliminate fluff.

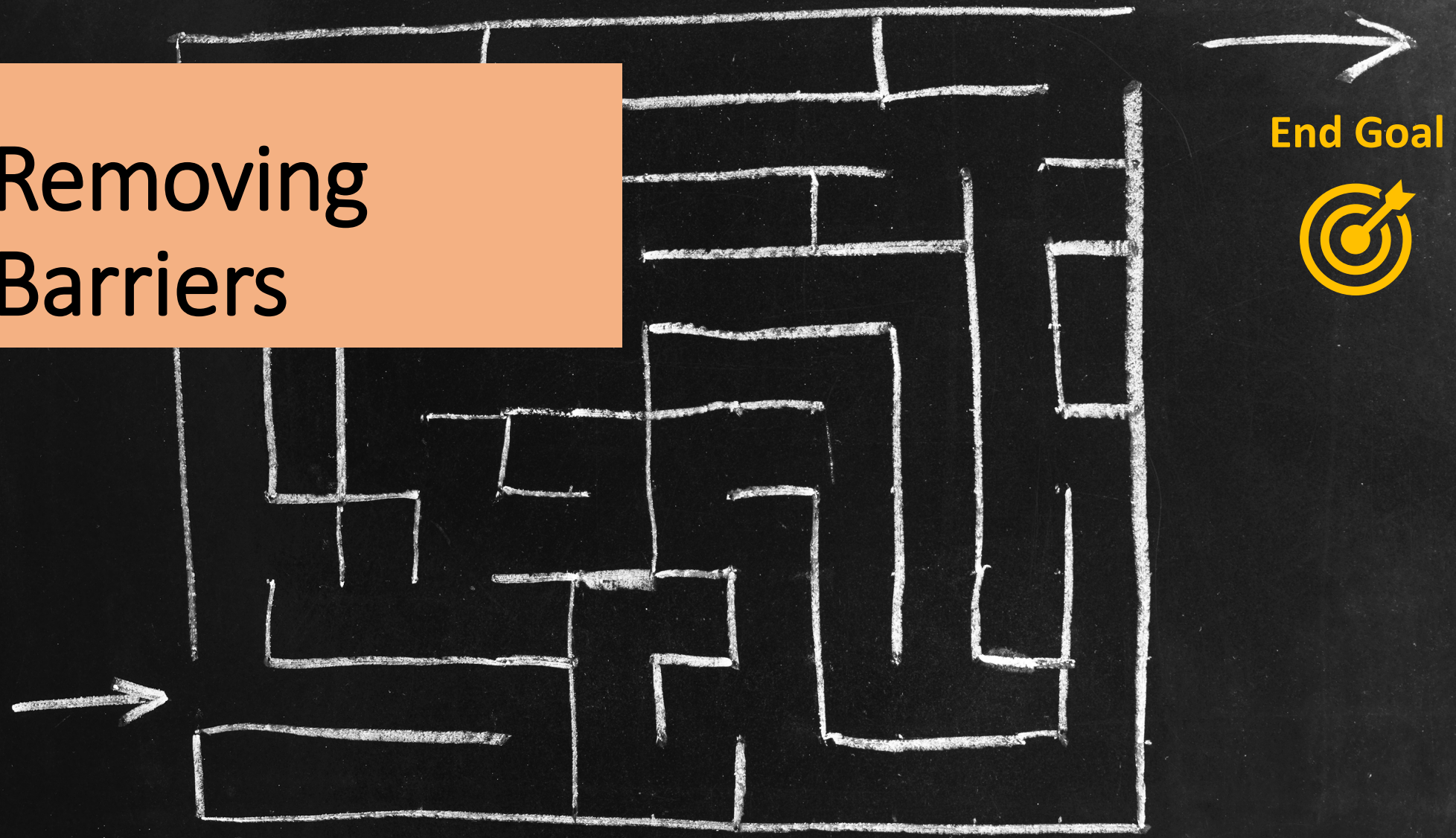
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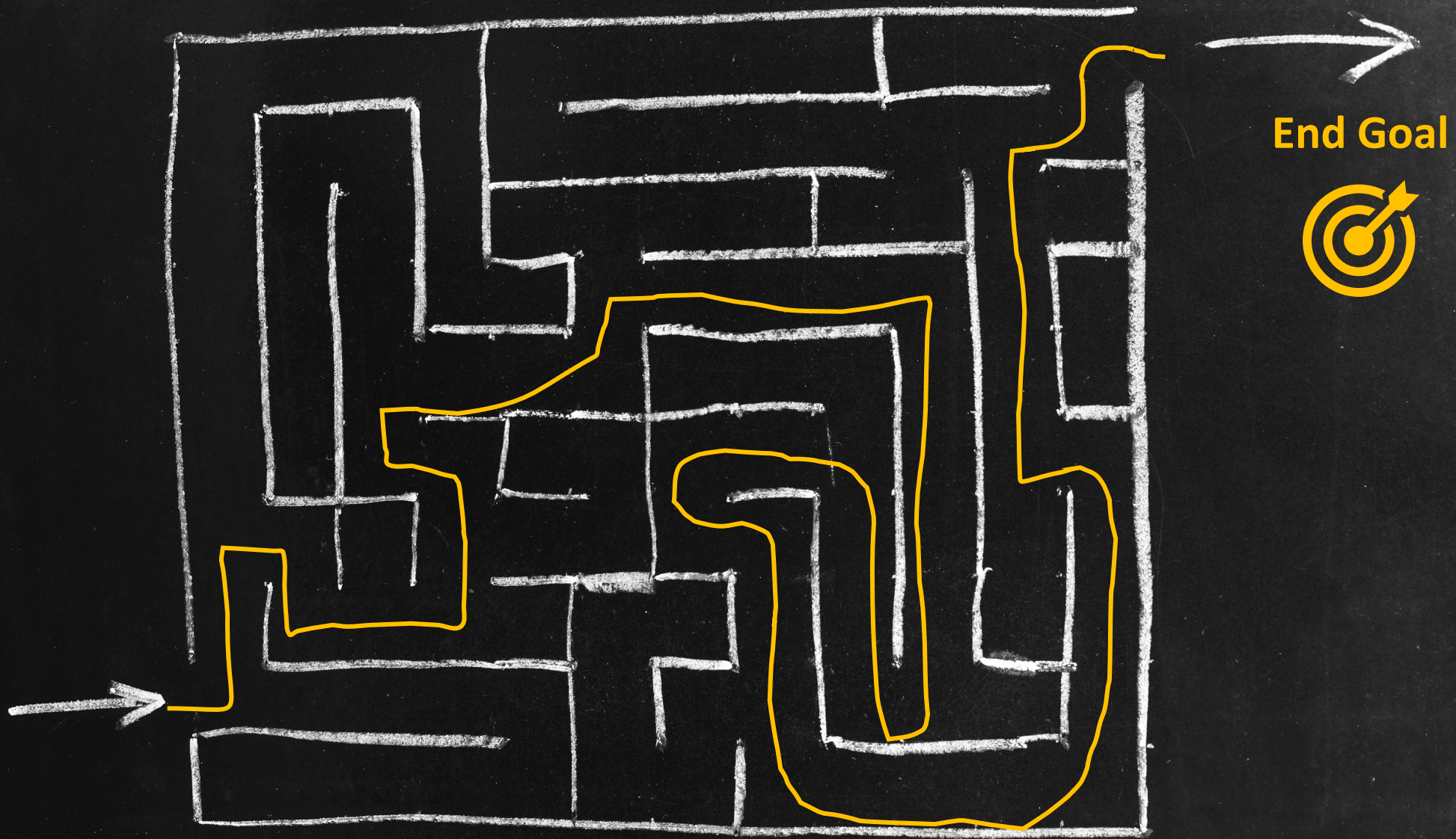
- Chunk it up.
- Hear words. See images.
- Eliminate fluff.
- Make important points obvious.

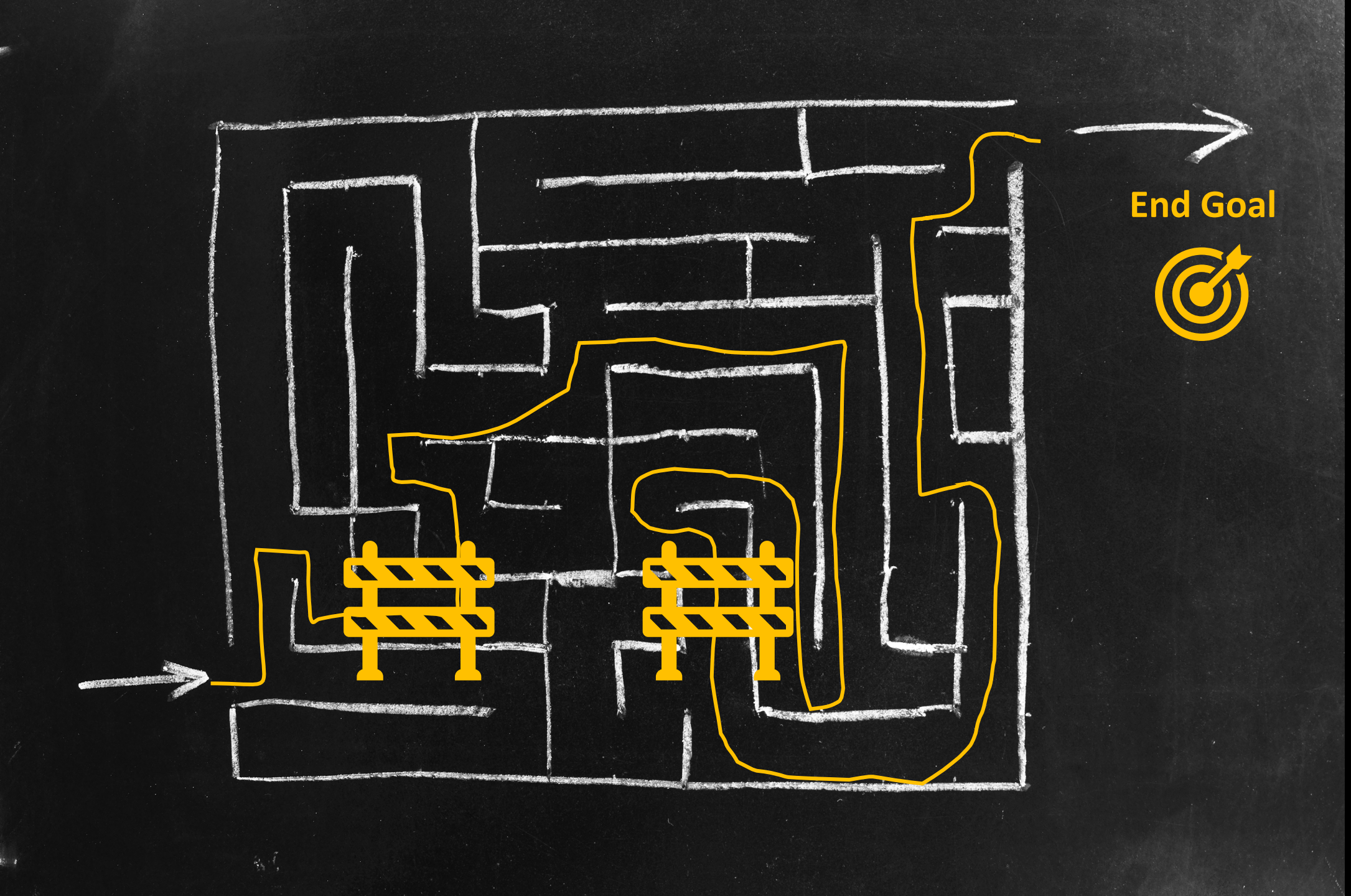
7 Removing barriers



Removing Barriers




End Goal


End Goal



Engagement

What sparks your interest / motivates you to learn?



Representation

What types of materials do you prefer?



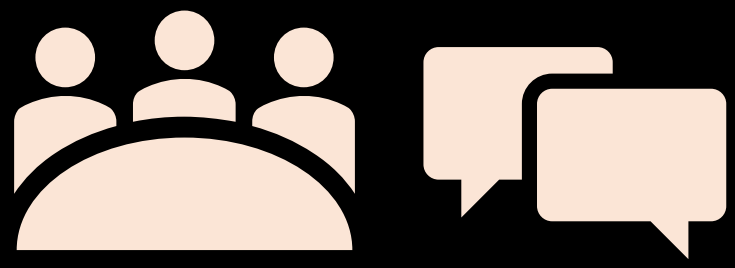
Action & Expression

How do you like to show you have learned?

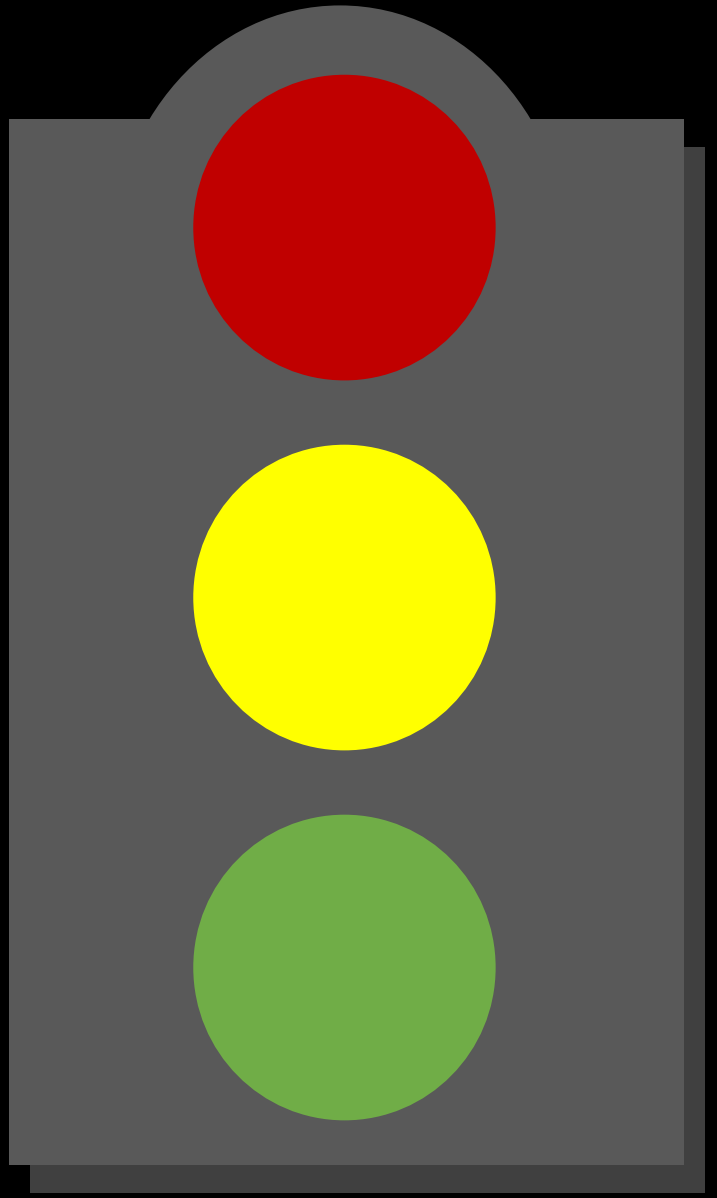
Universal Design for Learning

What learner experiences have you witnessed?

Learner Need	What it may look like	How can you remove barriers?
Sustaining attention	Fidgeting, multitasking, losing track, not listening, looking out window or on phone.	



- Stop doing
- Continue doing
- Start doing



Top 5 Next Steps

- Learn about audience to anticipate (& reduce) learning barriers
- Vary activities
- Same content in different forms
- Minimize cognitive load & aid memory
- Encourage thinking about HOW they think/learn (metacognition)

Keep Learning.

- Welcome Neurodiversity (elevateU book)
- Cast.org (Universal Design for Learning)