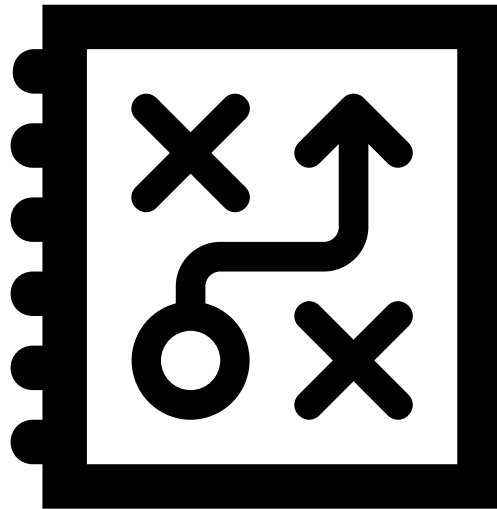


Planning with a Cognitive Science Lens



Dr Chris Baker

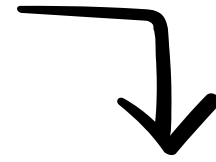
 drchrisbaker



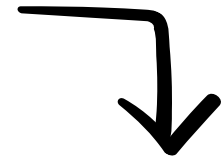
Cabot
Learning
Federation

Session Flow

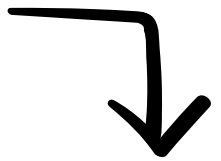
Attention



Working Memory



Long-term Memory



Cognitive Load Theory

Session Flow

Attention



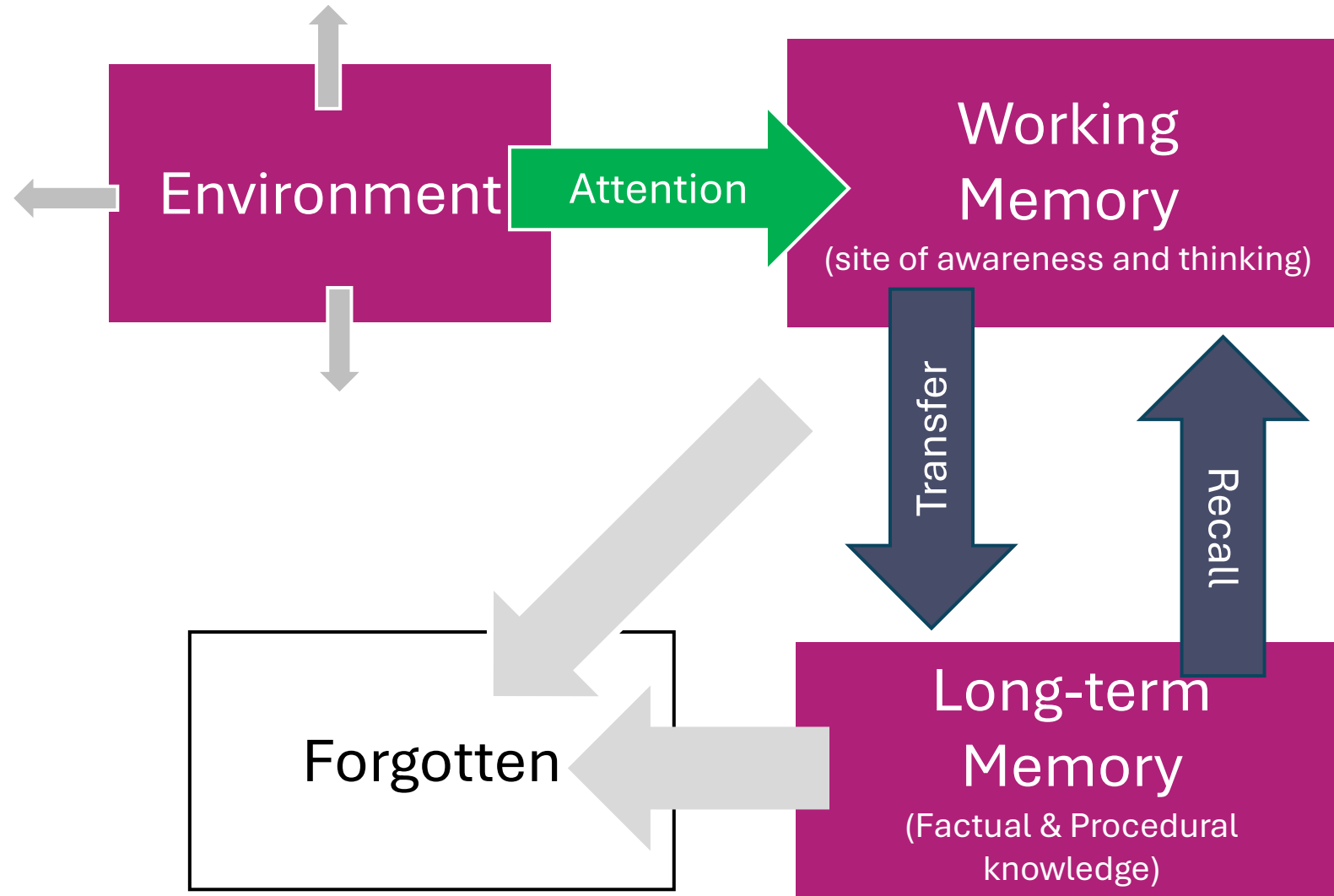
```
graph TD; A[Attention] --> B[Working Memory]; B --> C[Long-term Memory]; C --> D[Cognitive Load Theory];
```

Working Memory

Long-term Memory

Cognitive Load Theory

Attention – The Theory





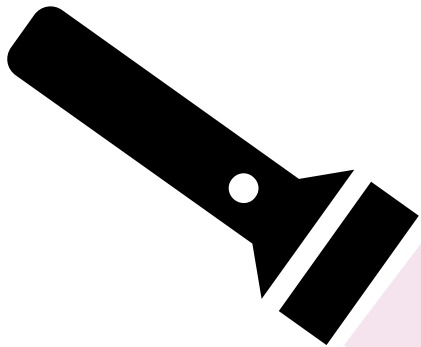
Key Takeaways?

What information is it essential that students move into their long-term memory?

Facts / Concepts / Common Misconceptions etc

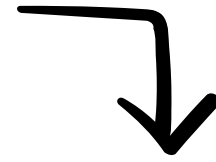
Spotlight Strategies?

- ✓ Text Formatting (Bold, Underline, Colour etc)
- ✓ Agreed Symbol (star, key etc)
- ✓ Verbal signposting

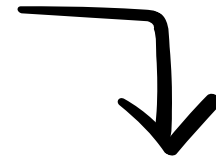


Session Flow

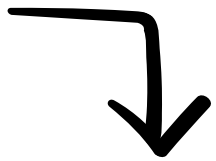
Attention



Working Memory

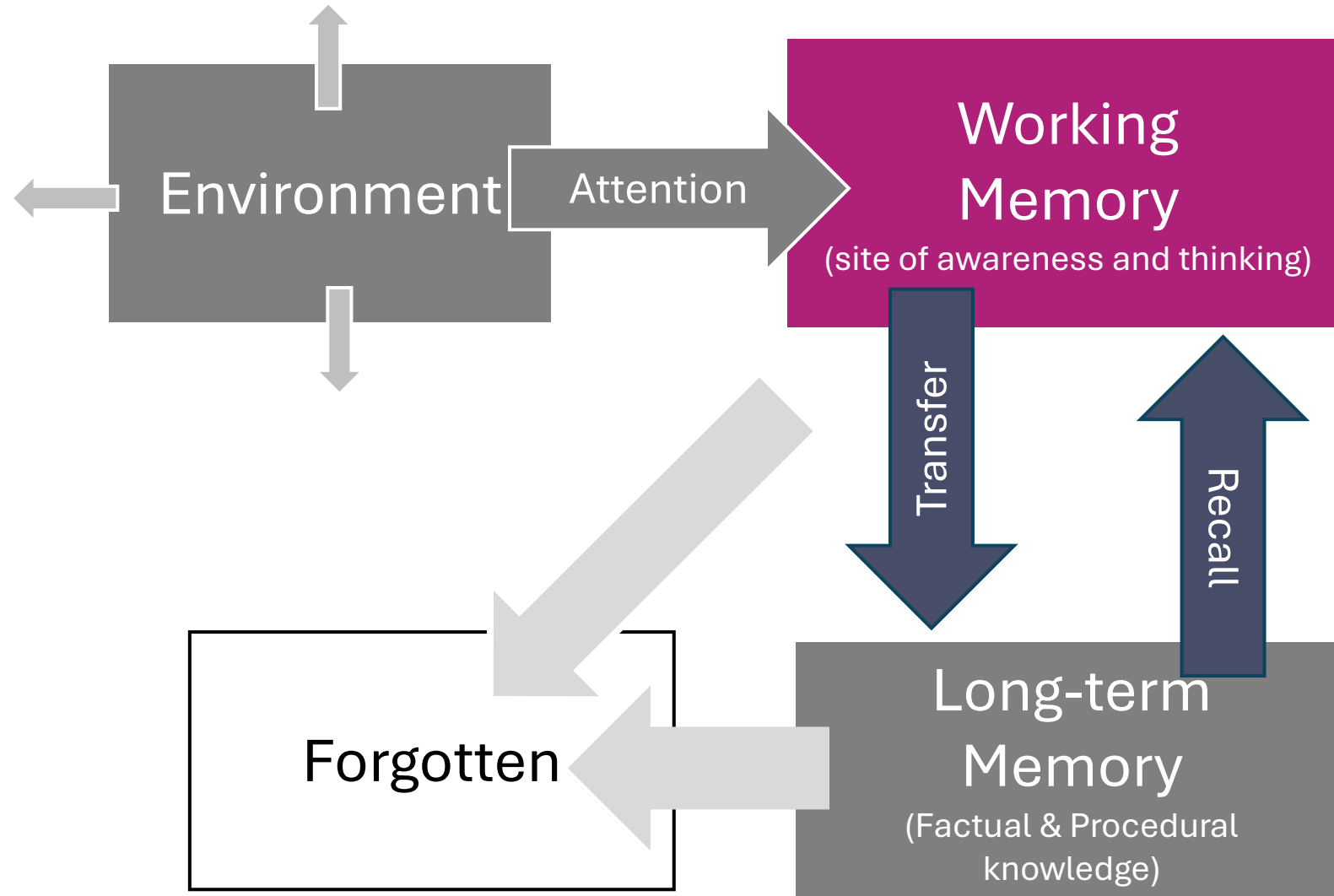


Long-term Memory



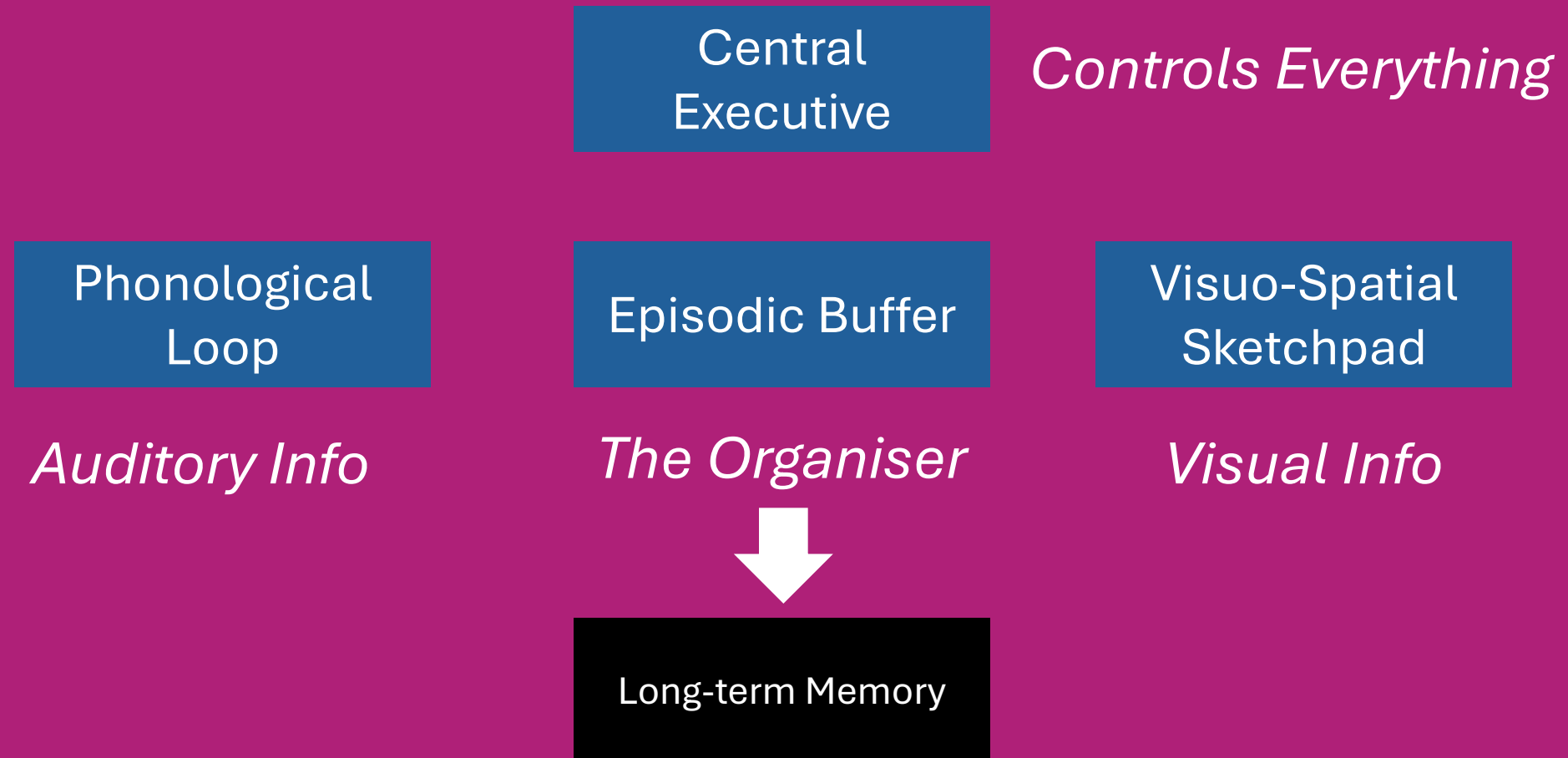
Cognitive Load Theory

Working Memory – The Theory



Working Memory – The Theory

a multi-component workbench where information is **temporarily held and manipulated**





Chunking

Breaking information down into logical and manageable chunks

Linking

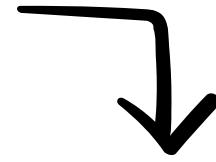
Activating prior knowledge

Combining Visual and Auditory?

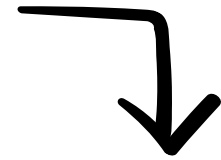
Taking advantage of both coding channels?

Session Flow

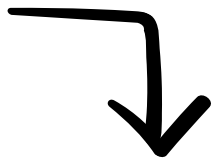
Attention



Working Memory

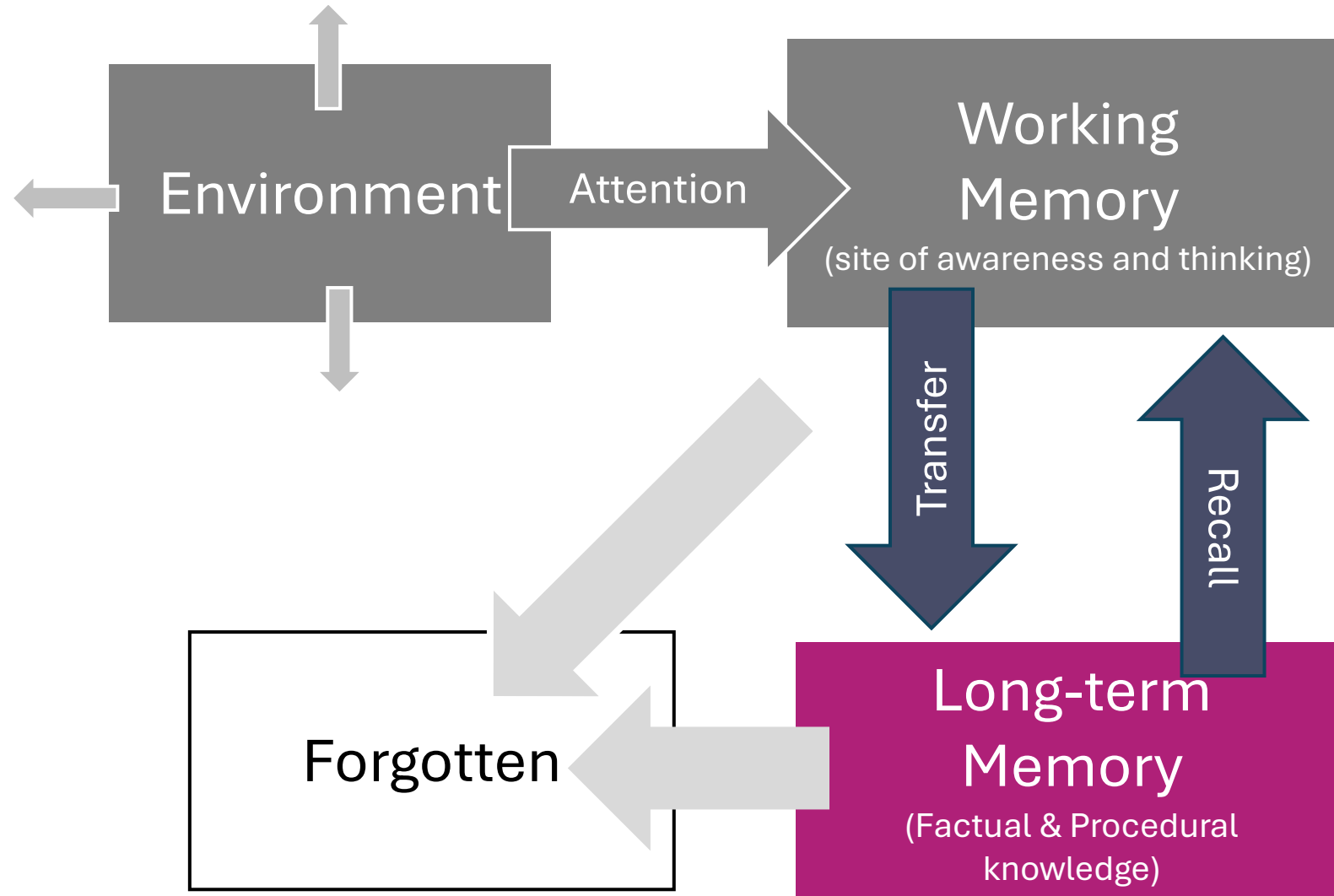


Long-term Memory

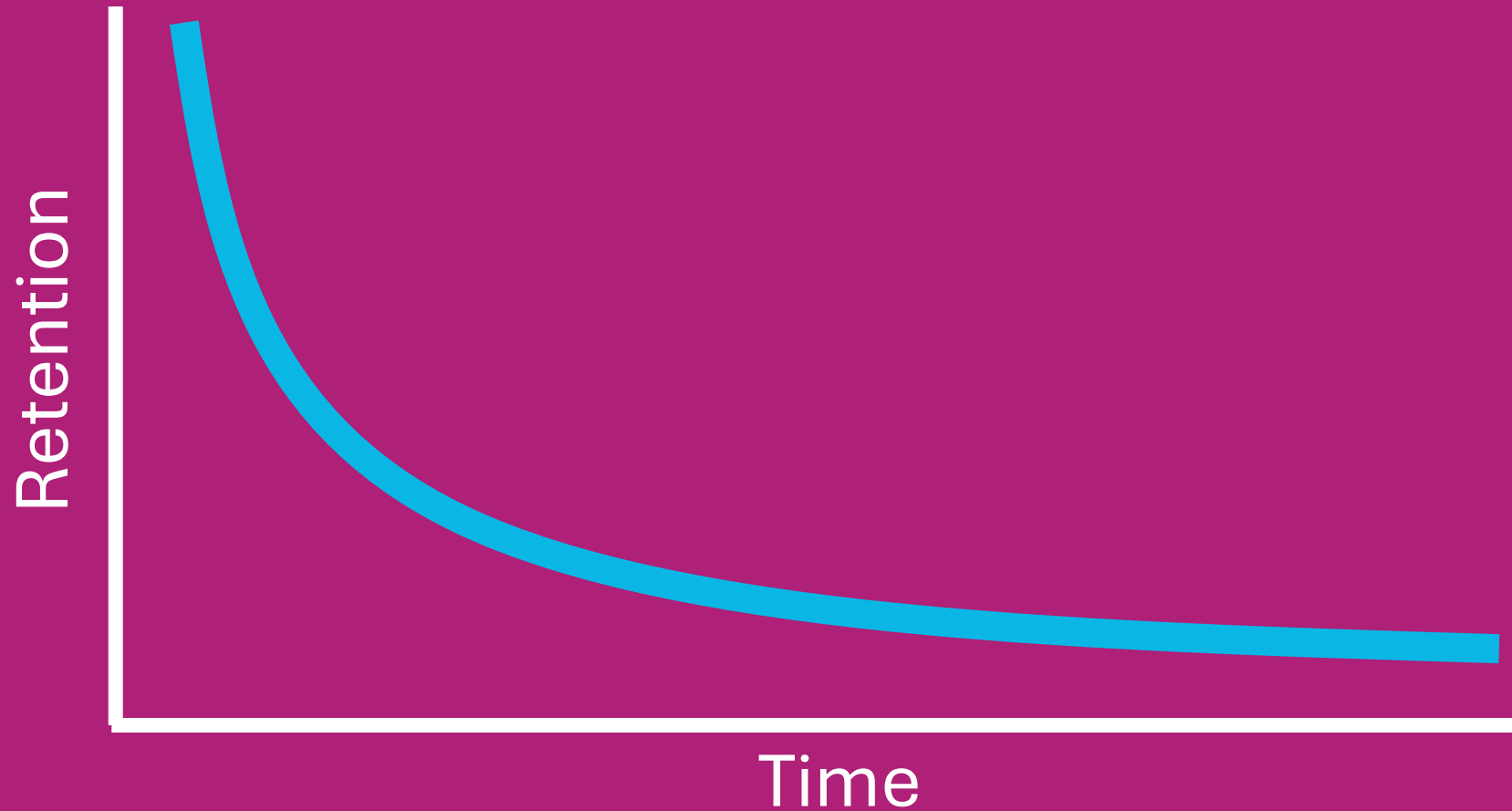


Cognitive Load Theory

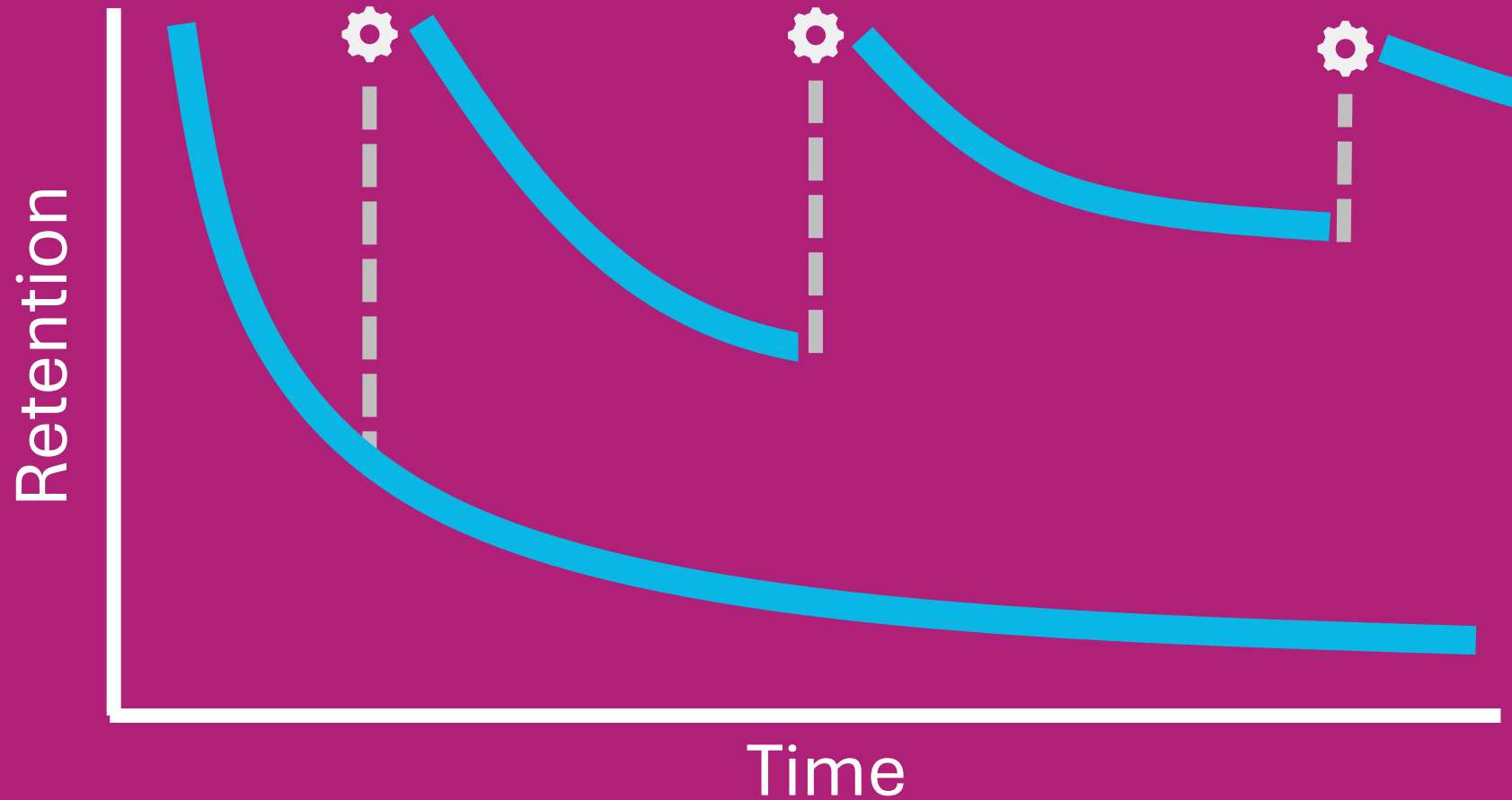
Long-term Memory – The Theory



The Forgetting Curve



The Forgetting Curve



Long-term Memory – The Application



Retrieval

Creating tasks or quizzes that require students to recall information from the past

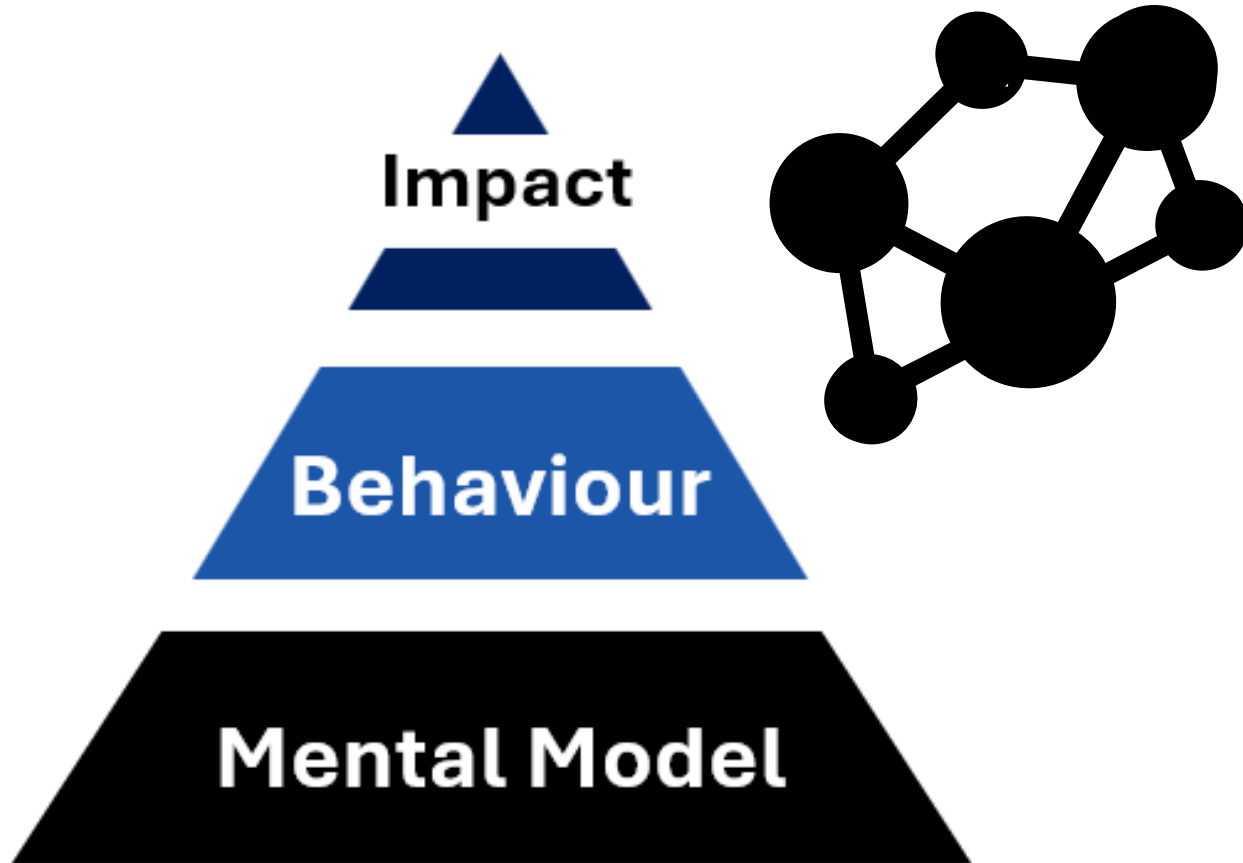


Spaced Practice

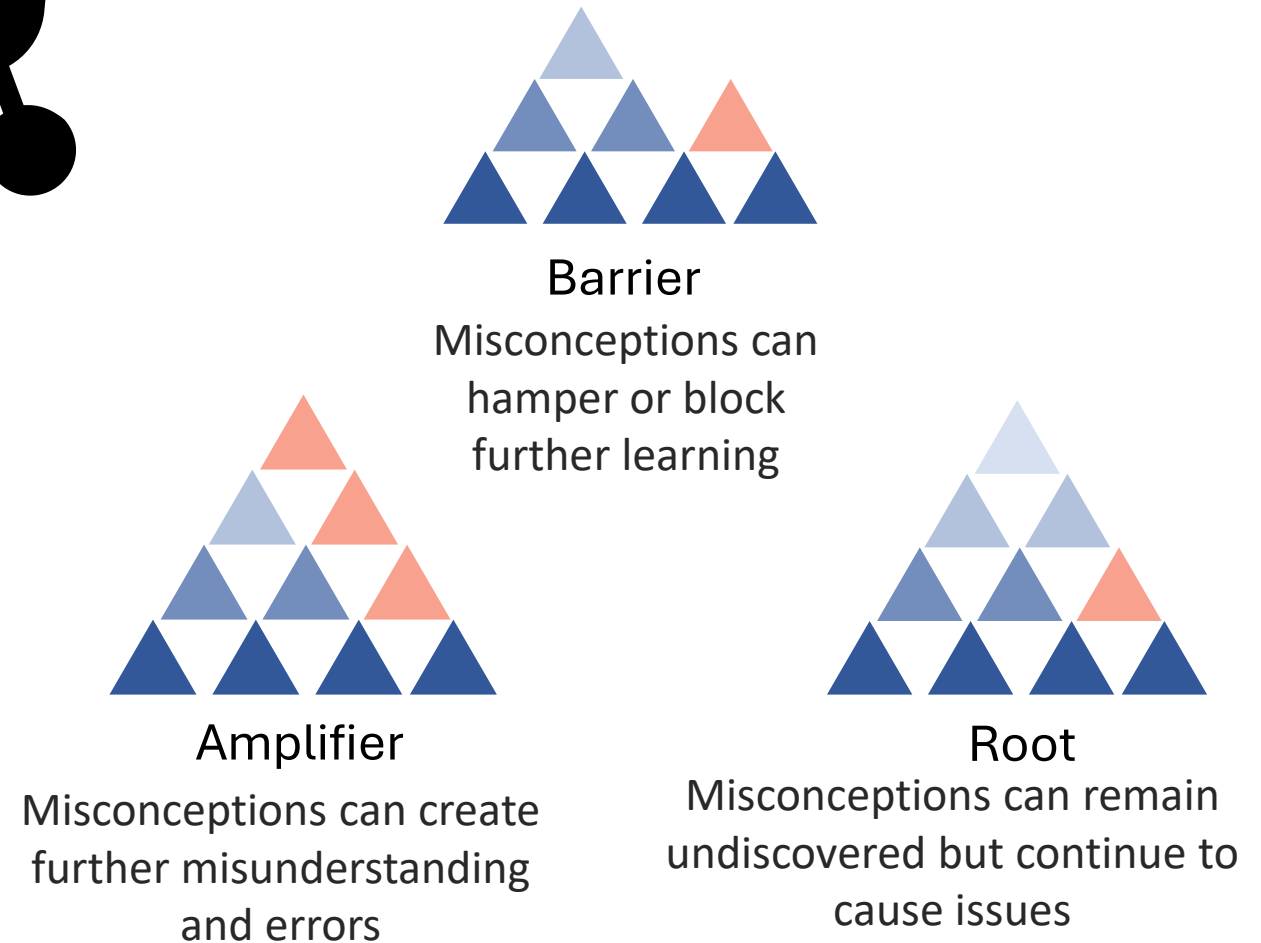
Repeating key skills, processes and activities

Long-term Memory – Mental Models & Misconceptions

Schema & Mental Models



Misconceptions





Interleaving

Proactively linking to other related topics

Hinge Questions

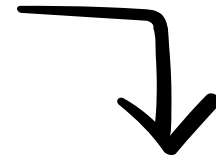
Purposefully checking understanding between topics or stages

Exit Tickets / Tasks

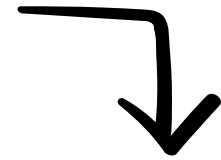
Checking overall understanding to inform future planning

Session Flow

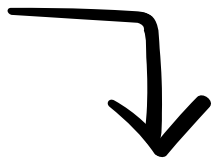
Attention



Working Memory



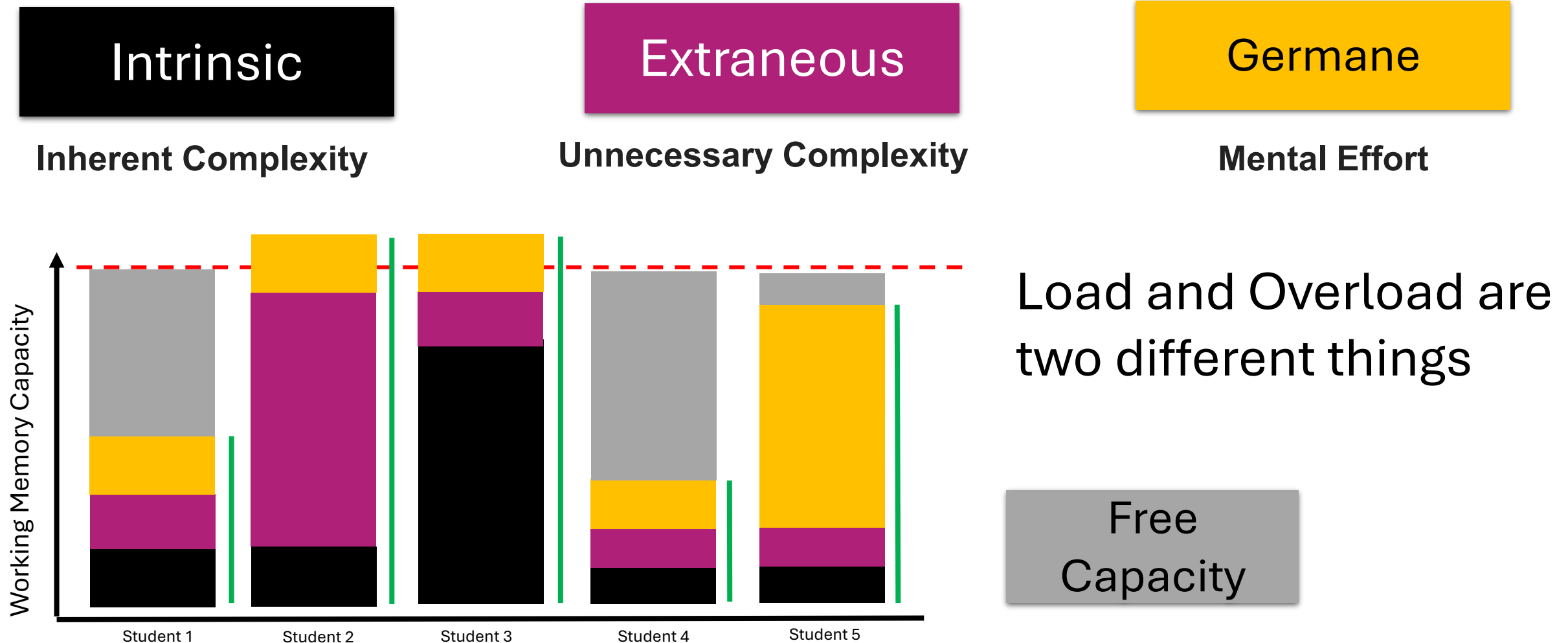
Long-term Memory



Cognitive Load Theory

Cognitive Load Theory

Everything presented to the learner has a working memory cost

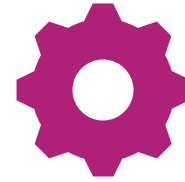


The Split-attention Effect

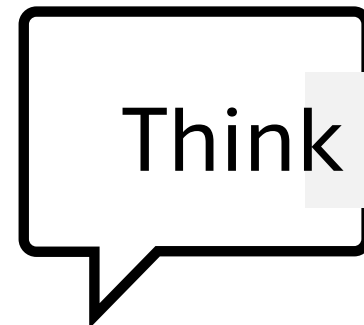
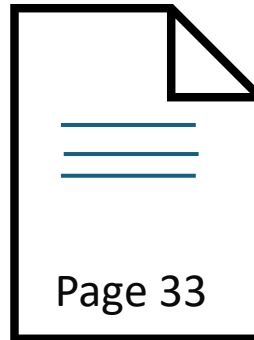
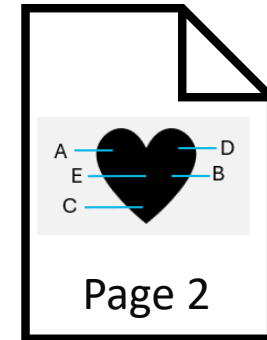
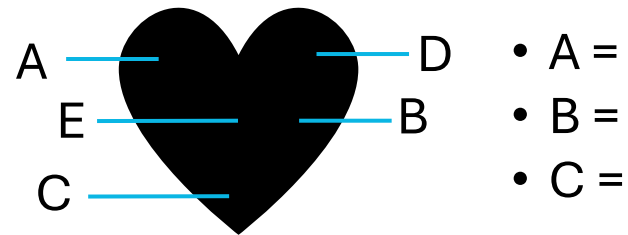


Theory

Information that needs to be combined should be placed together in space and time



Application



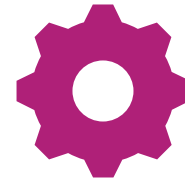
Think back to last year...

The Modality Effect

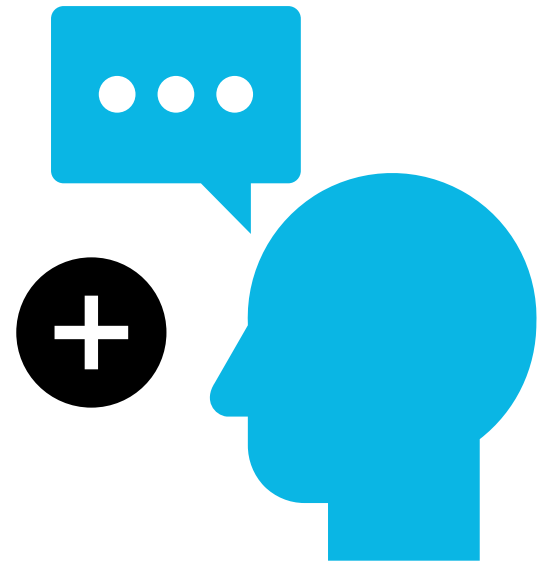


Theory

learning or recall is improved when information is presented using a mix of auditory and visual modes (e.g., spoken narration with a diagram)



Application

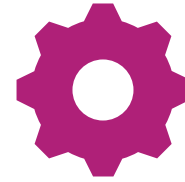


The Redundancy Effect



Theory

Giving students irrelevant information whilst they are learning something will clog up their working memory and risk of them remembering the wrong stuff



Application

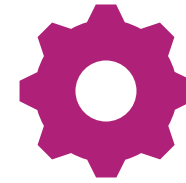
- Less words
- No irrelevant images
- Less Animations
- Less irrelevant anecdotes
- Don't read slides

The Isolated Interacting Elements Effect

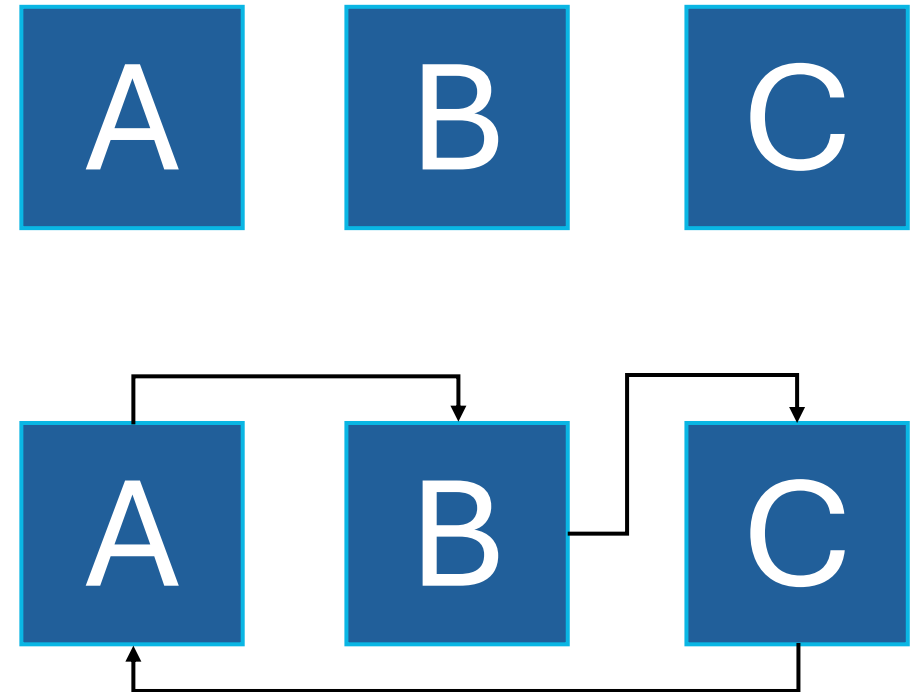


Theory

Forcing a learner to process the different elements of an equation, process, skill etc simultaneously can overload their limited working memory.

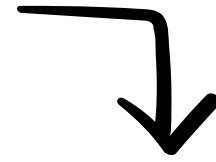


Application

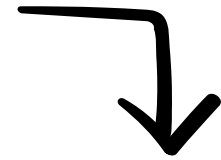


Session Flow

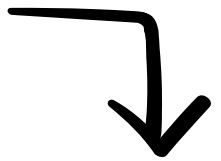
Attention



Working Memory



Long-term Memory



Cognitive Load Theory