My brain is hurting!
Causes of Cognitive Overload

Martin Morgan

martin@empowereducation.org.uk

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When I communicate with other people...what I have in mind is an idea that I intend they should understand. However, this idea arises from my mental model of the world, which is itself the product of my unique personal biography.

Nobody has exactly the same mental of the world, since nobody else has had exactly the same experience.

The Meaning Makers – Gordon Wells

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The ‘illusion’ of shared clarity

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Cognitive Load Theory (CLT)

‘our working memory is only able to hold a small amount of information at any one time and that instructional methods should avoid overloading it in order to maximise learning’

John Sweller, 1988

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Working Memory And Long-Term Memory

Working memory has a limited capacity and consists of multiple components that are responsible for directing attention and coordinating cognitive processes.

Long-term memory, on the other hand, has an endless capacity for storage and works with working memory to retrieve information

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Tawe	Taf
Cothi	Ogmore
Afan	Cynon
Loughor	Usk
Taff	Llynfi
Ysgir	Elon
Teifi	Wye

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Working Memory levels

University Challenge	11+
Mastermind	8-10
Family Fortunes	5-7
Weakest Link	Less than 5

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Working Memory - Characteristics

Working memory is limited in size. Typically for adults, according to Miller's Law, this is 7 +/- 2 chunks.

Storage time can be as little as 5 seconds

1. What will be the effects on our learners if we exceed this limit?

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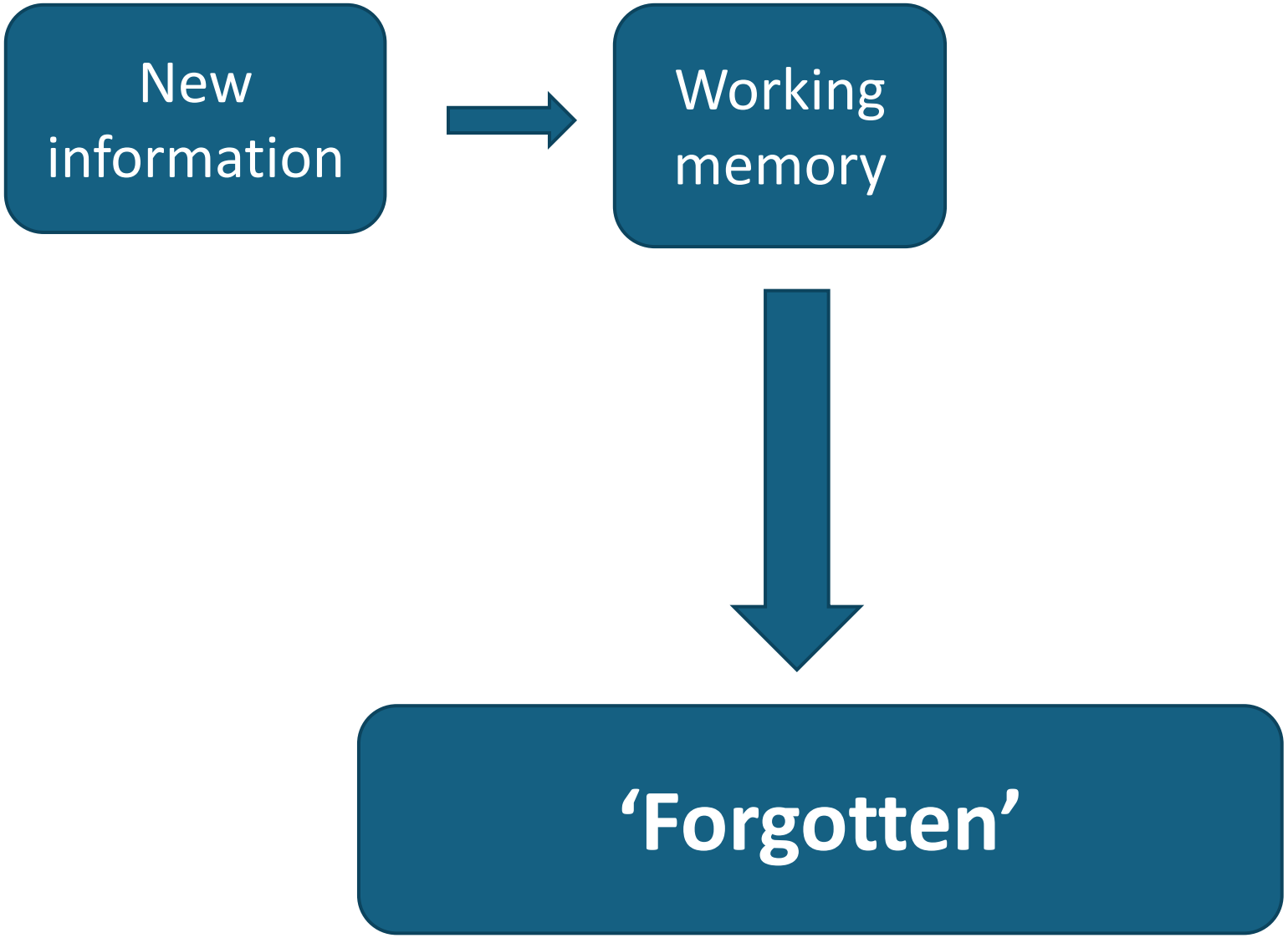
Engagement



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What are the main causes of cognitive overload for young people in lessons?

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Teaching ≠ Learning

Telling ≠ Understanding

Assuming = Guessing

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Overloading lesson sequences

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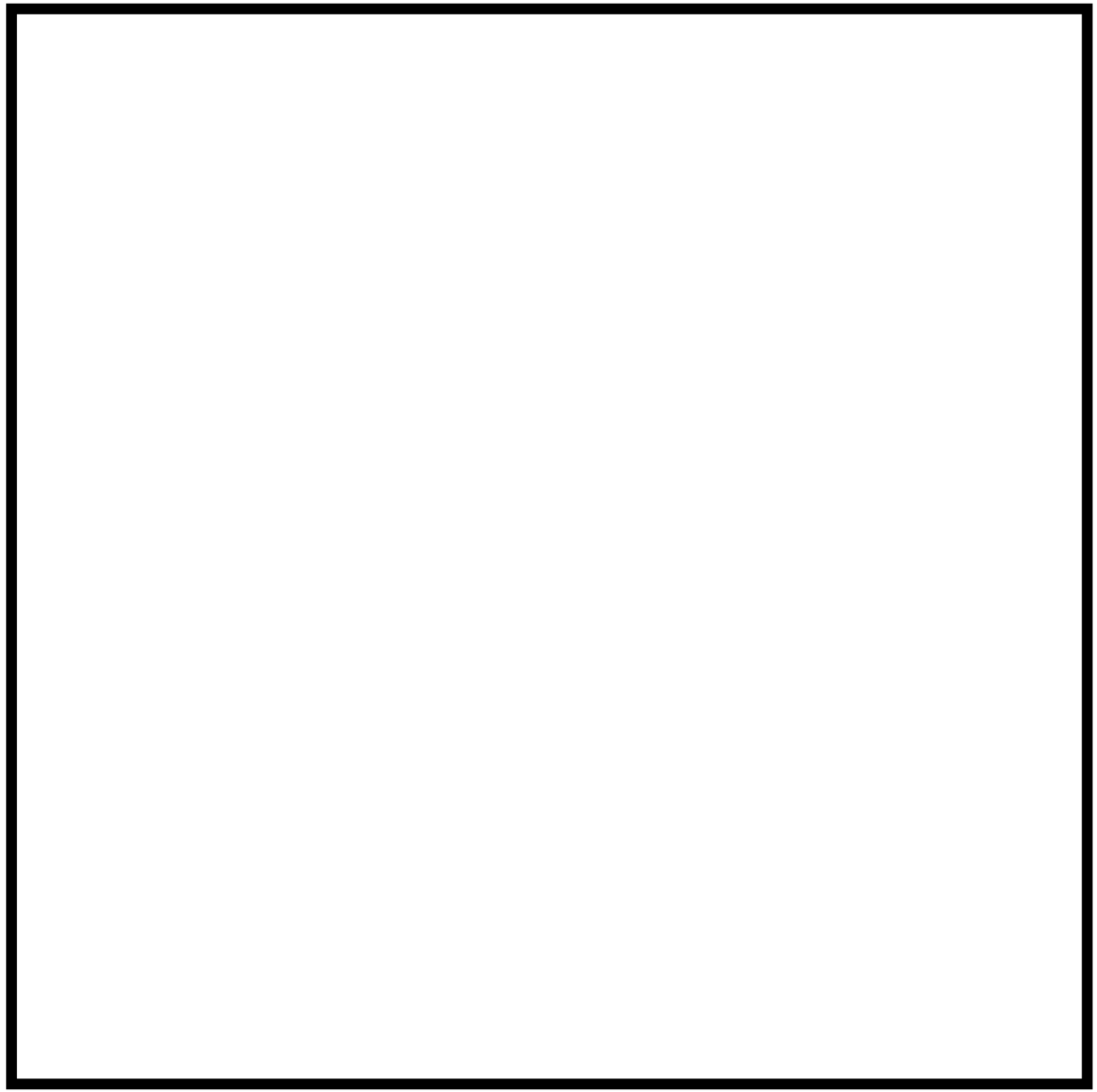
A plane figure with four equal sides and four interior right angles. This figure is a quadrilateral and also a regular polygon



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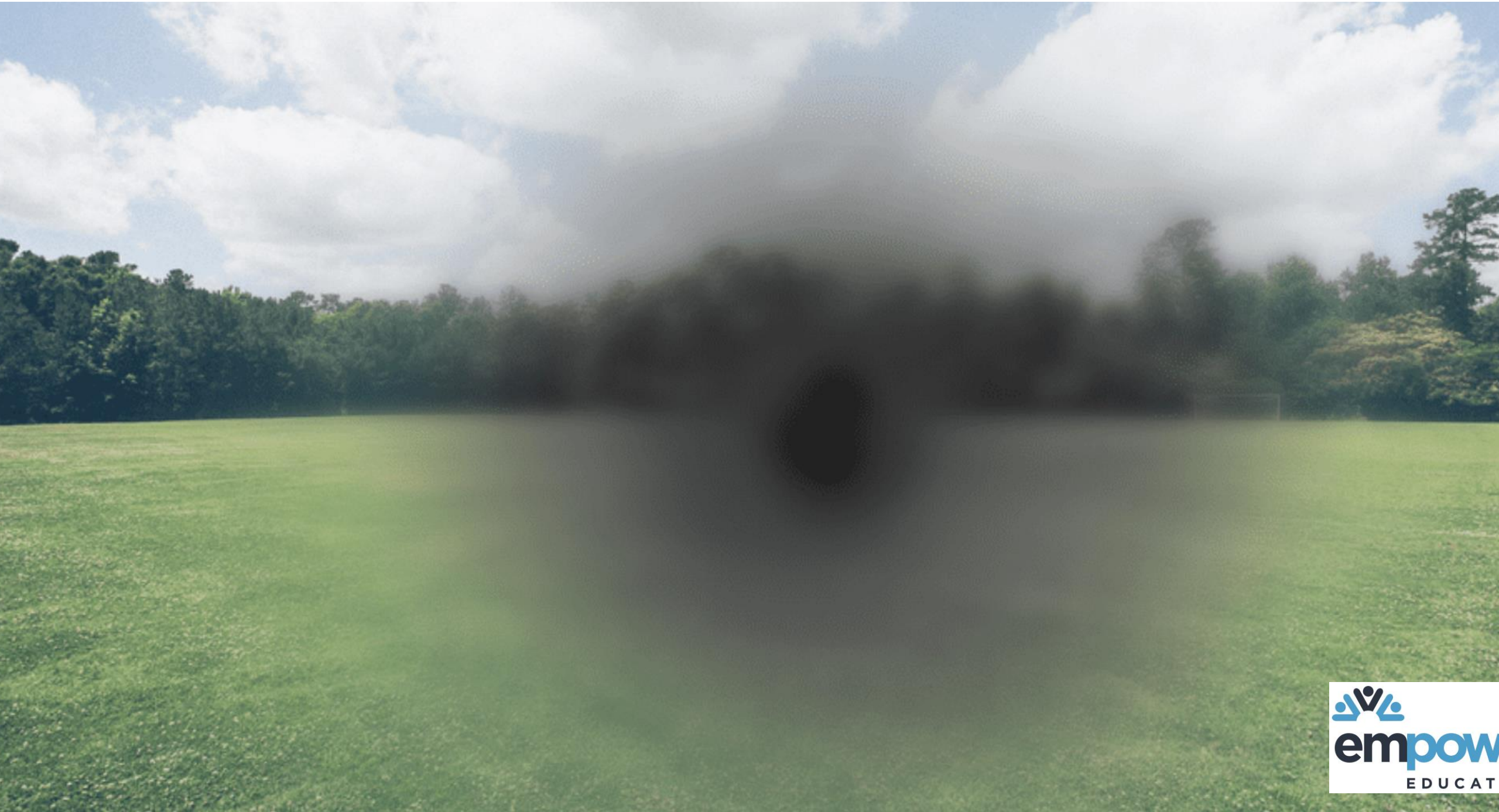

"The range of what we think and do is limited by what we fail to notice. And because we fail to notice that we fail to notice, there is little we can do to change; until we notice how failing to notice shapes our thoughts and deeds."

R.D. Laing

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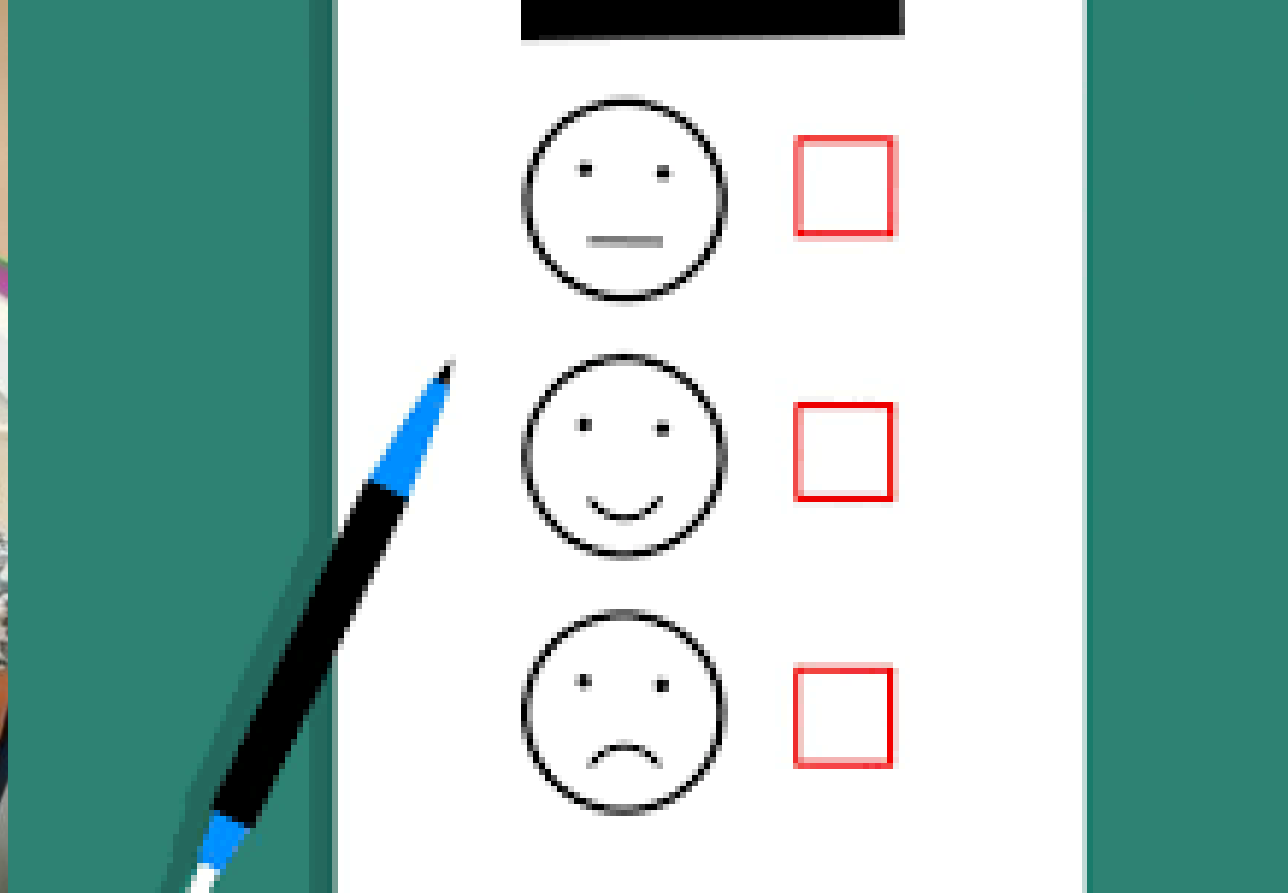

Interviewing Learners or Questionnaires

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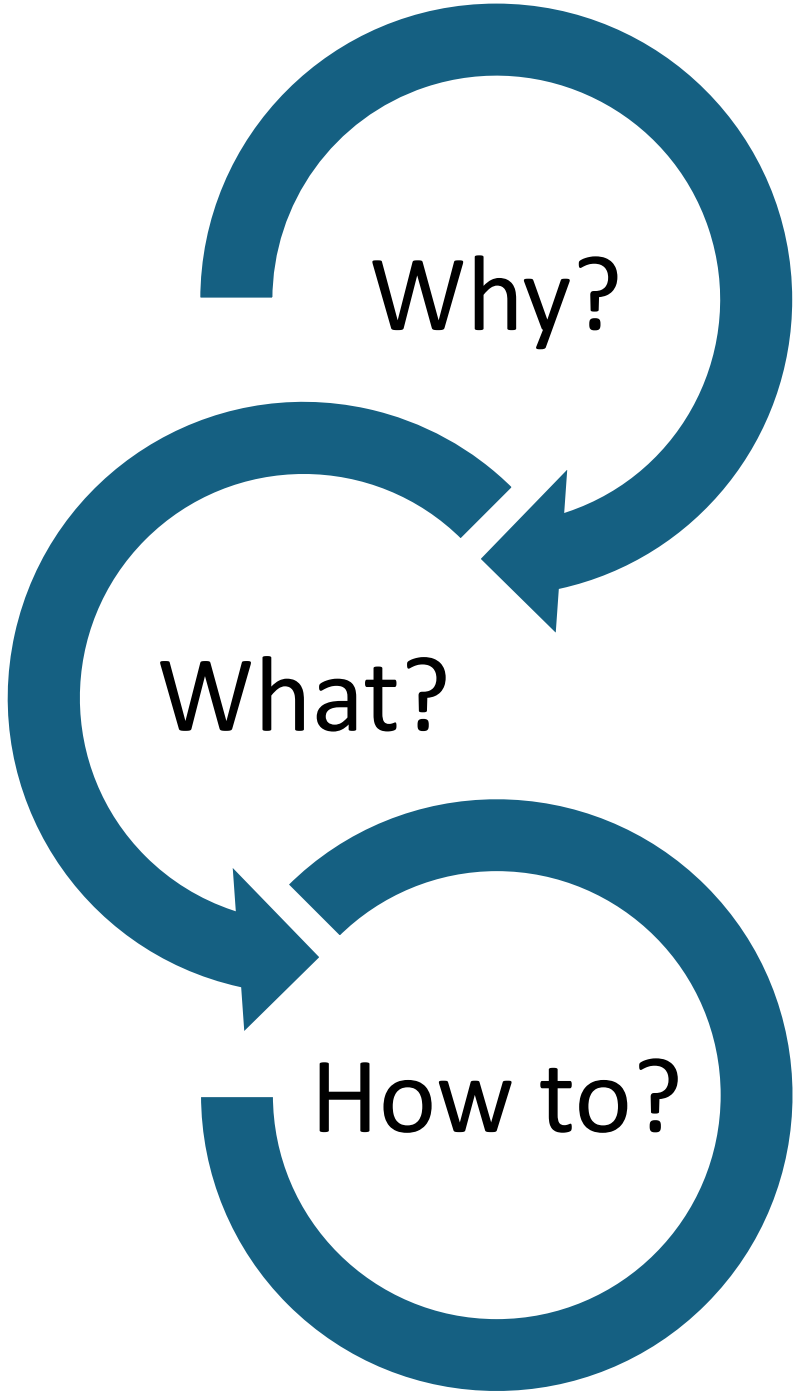

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ASSESSMENT CAPABILITY—USING LEARNING INTENTIONS			
Complete Integration	**Deliberate Application**	**Initial Application**	**No Application**
In addition to all the "Deliberate Application" criteria . . . • The teacher involves students in the deconstruction of the learning intention.	• The teacher states or writes clearly what the students will be learning, providing appropriate explanation and checking for their understanding. • The teacher makes connections to the learning intentions (LIs) during instruction and	• The teacher identifies LIs based on overall expectations but does not clarify with students to ensure that the teacher and students share the same understanding. • The connections the teacher makes to the LIs tend to be made at the start and end of the lesson.	• At no time during the observation does the teacher convey to students what they will be learning. • The teacher does not make connection to the LIs during instruction and when students are engaged in the learning activities. • Students indicate

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ASSESSMENT CAPABILITY—USING SUCCESS CRITERIA

Complete Integration	Deliberate Application	Initial Application	No Application
In addition to all the "Deliberate Application" criteria . . . • Where appropriate, the teacher and students co-construct success criteria. • Students self-assess and peer assess their learning and make improvements	• The teacher shares and clarifies the success criteria (SC) with students. • The teacher helps students understand what is required of them to be successful in their learning (through the use of worked examples, modeling,	• The teacher shares the SC with students. • When asked, students offer varying descriptions of what is being required of them to be successful. • The teacher provides opportunities for students to discuss the SC.	• The teacher either has not identified the success criteria for the learning intentions, or if she or he has, she or he fails to share these with students. • When asked, students either couldn't describe how they would know when they have learned what

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ASSESSMENT CAPABILITY—USING LEARNING PROGRESSIONS

Complete Integration	Deliberate Application	Initial Application	No Application
In addition to all the "Deliberate Application" criteria . . . • Students can monitor their current performance and progress against the learning progressions.	• The teacher shares with students the predetermined learning progressions (sequence of subskills and enabling knowledge) under the targeted LIs. • The teacher monitors the performance of	• The teacher monitors the performance of students against the expected progress, using learning progressions, and shares this information with students. • Students can articulate their current	• The teacher does not monitor student learning progress. • The teacher does not share learning progressions with students. • Students are unable to identify their current performance or what they need to do to successfully

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Why ‘whole class’ teaching?

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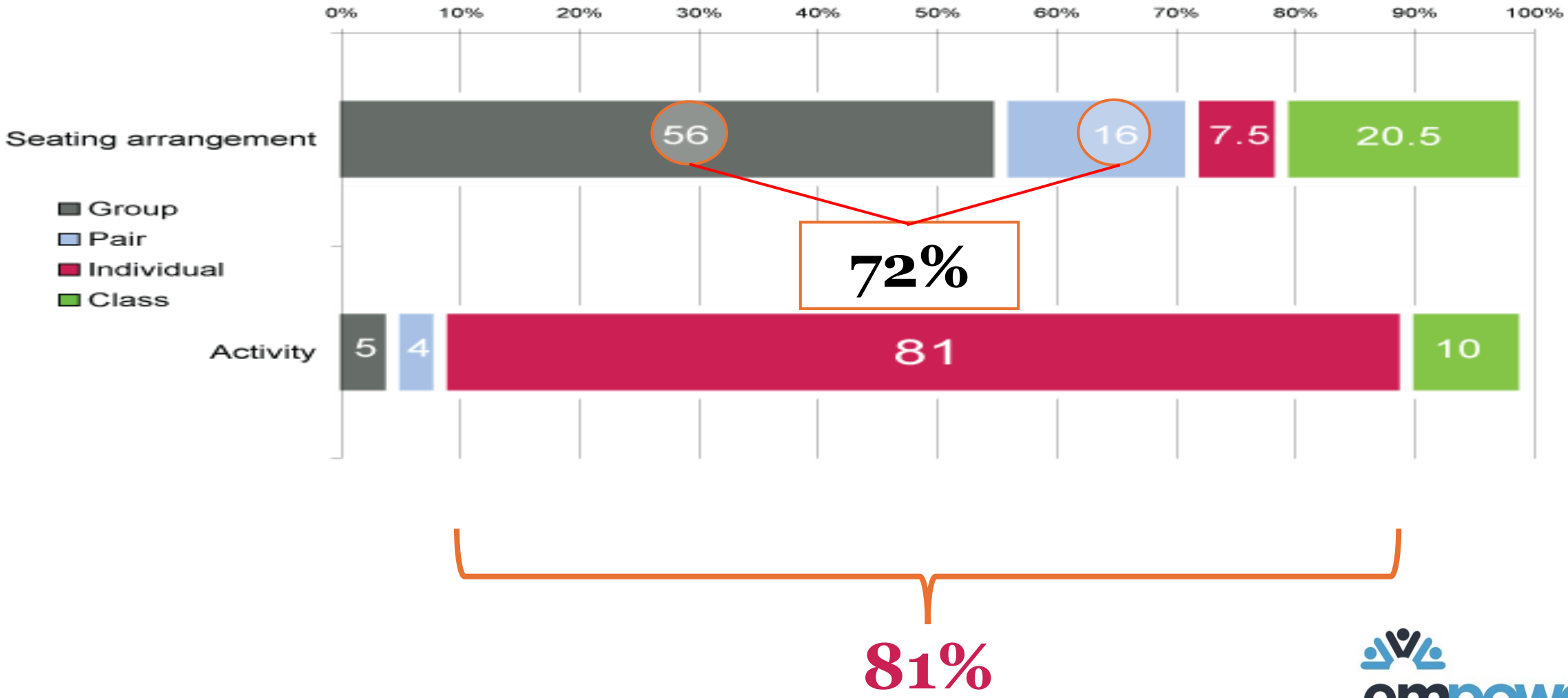
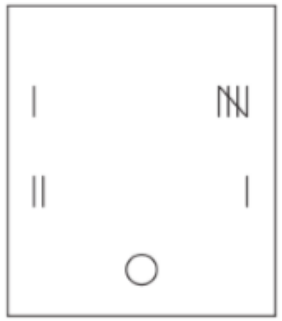
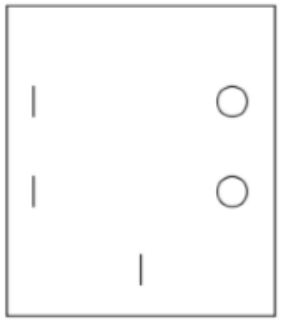
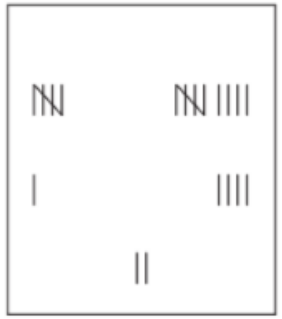
Seating and Activities...

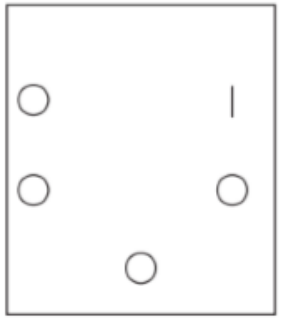


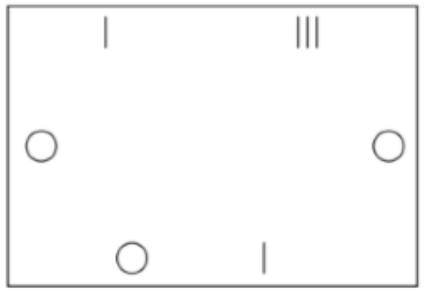
Engagement Tally











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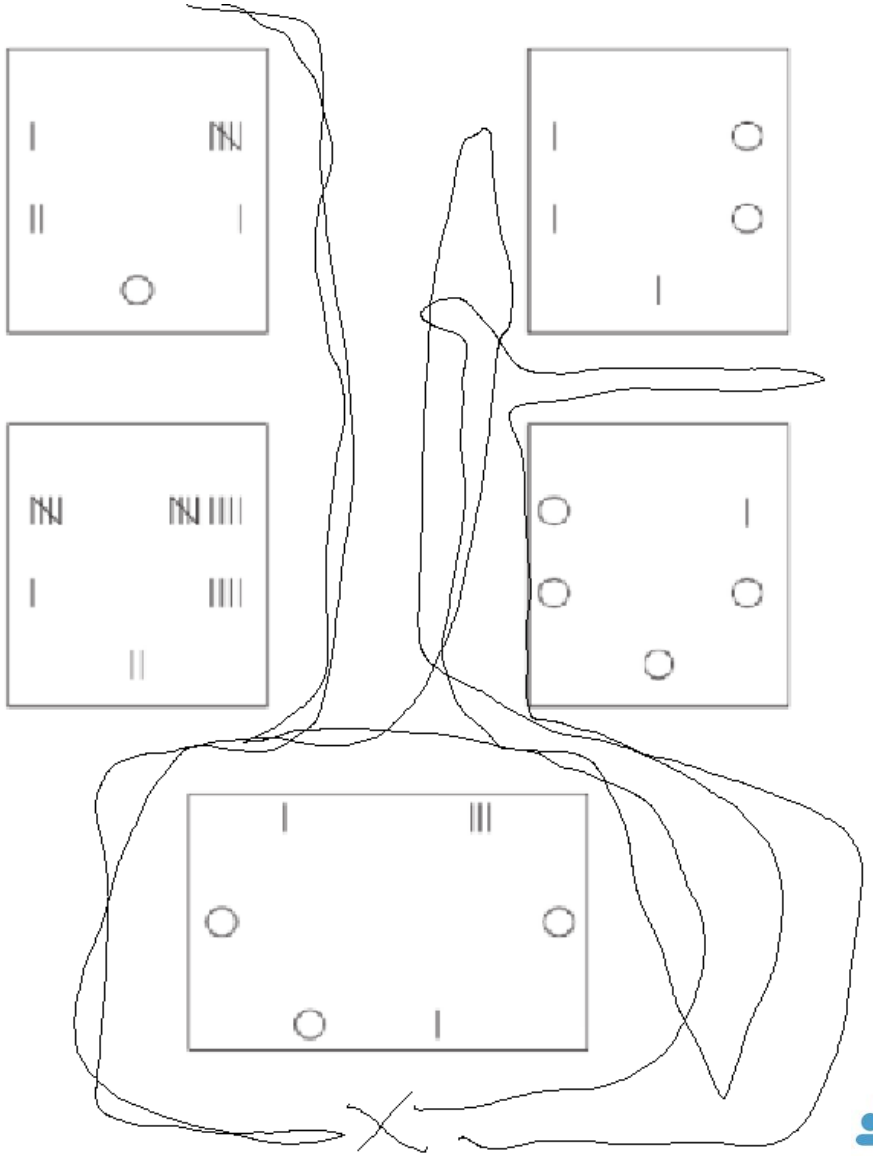
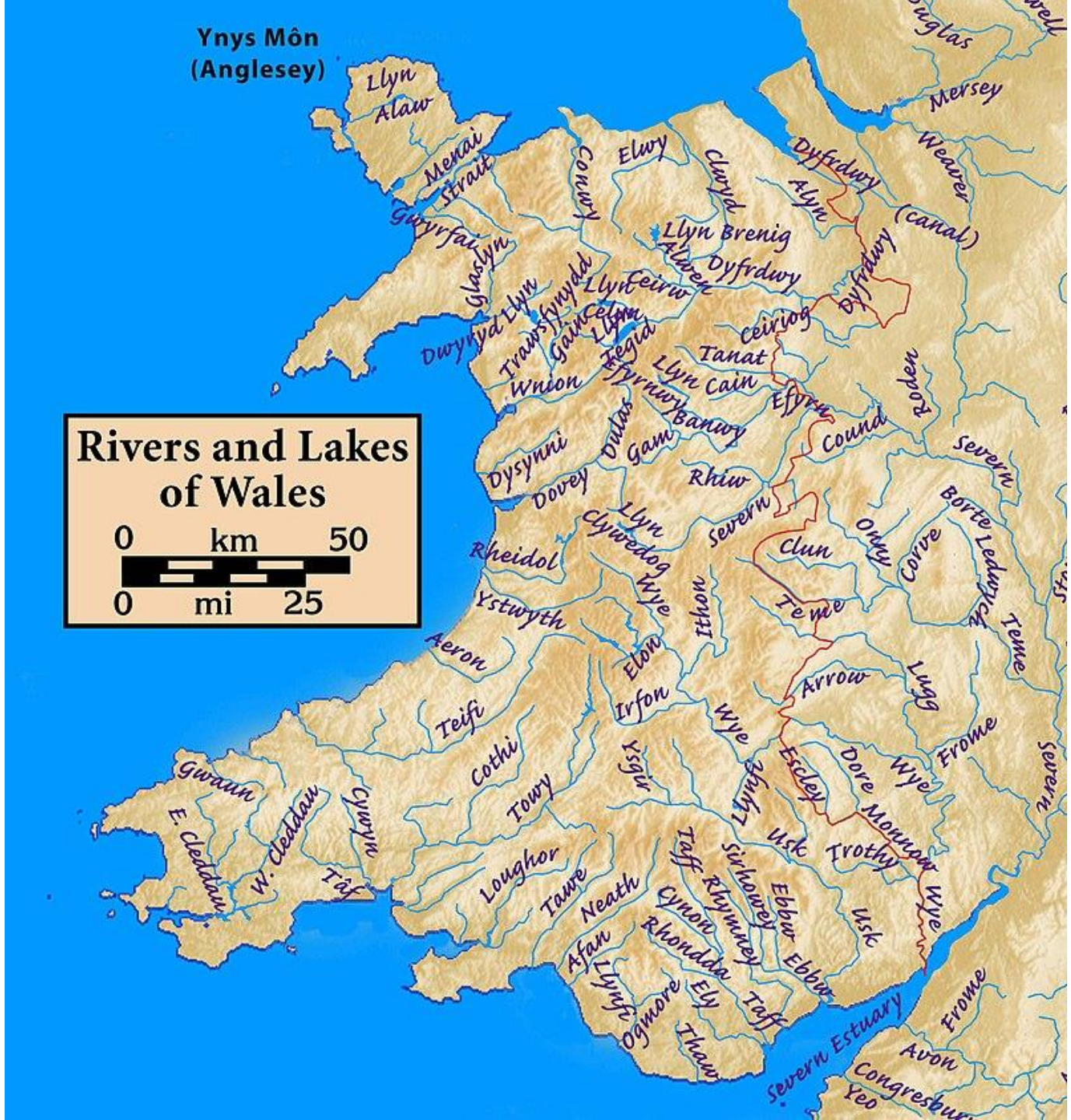
Movement




Rivers and Lakes of Wales
0 km 50
0 mi 25
Ynys Môn (Anglesey)
Llyn Alaw
Menai Strait
Conwy
Elwy
Clwyd
Dyfrdwy
Alyn
Weaver
(canal)
Mersey
Llyn Brenig
Alwen
Dyfrdwy
Llyn Celyn
Tanat
Ceiriog
Llyn Cain
Efyrnwy
Banwy
Severn
Rodan
Dysynni
Dovey
Dulas
Gam
Rhiw
Clywedog
Rheidol
Ystwyth
Aeron
Wye
Ithon
Elan
Irfon
Teifi
Cothi
Towy
Ysgir
Llynfi
Escley
Arrow
Lugg
Frome
Dore
Monnow
Wye
Usk
Trothy
Ebbw
Sirhowey
Taff
Rhymney
Cynon
Rhondda
Ely
Ogmore
Llynfi
Afan
Neath
Taure
Loughor
Taf
Cywyn
W. Cleddau
E. Cleddau
Gwaun
Severn Estuary
Avon
Yeo

What is learning?

"Learning is a change in long-term memory."

Kirschner, Sweller and Clark (2006)

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Key principles when "teaching for memory"

- Engagement is not enough
- Learners need to engage in thinking hard about what we want them to remember
- Don't overload working memory
- Regular re-visiting of content is required
- Low stakes testing

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Prior learning…?

‘Humans in the Stone Age ate dinosaurs.’

‘History calls them Romans because they never stayed in one place for very long.’

‘H2O is hot water and CO2 is cold water.’

‘Noah’s wife was called Joan of Ark.’

‘Christians have only one spouse. This is called monotony.’

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Benefits of Knowing Starting Points

- Saves time
- Identify misconceptions and confusion
- Builds learner competence
- Enables real differentiation
- We can measure our impact
- Provides opportunities for retrieval practice

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Ways To Find Out Starting Points

- Pre/Post Testing
- Cold/Hot Tasks
- Observation
- Discussion/Feedback
- KWI or Knowledge Grids

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Knowing Starting Points Is Linked To:

- Activating Prior Knowledge
- Revisiting
- Retrieval
- Feedback
- Progress

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Allen	Carnon
De Lank	Inny
Fowey	Looe
Camel	Par
Fal	St Austell
Cober	Tamar
Helford	Truro

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Q&A

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