

Quiz



1. True or False? Re-reading and highlighting important information are more effective at building long-term memory than completing a low-stakes test.
2. Which concept is used to explain how information is stored in the long-term memory?
 - a) Schema
 - b) Mental model
 - c) Knowledge organiser
3. True or false? Pupils learn new information by attaching it to what they already know.



Quiz: Please complete the questions

Quiz answers



1. True or **False**? Re-reading and highlighting important information are more effective at building long-term memory than completing a low-stakes test.
2. Which concept is used to explain how information is stored in the long-term memory?
 - a) **Schema**
 - b) **Mental model**
 - c) Knowledge organiser
3. **True** or false? Pupils learn new information by attaching it to what they already know.

Building well organised mental models



Facilitator Name

 @TeachFirst  @teachfirstuk

Seminar norms

Throughout the seminar, please:



Be present



Be proactive



Critique with kindness

Seminar objectives

By the end of this seminar, you will:

- know what mental models are and how they are developed
- identify strengths and areas for development in your retrieval quiz
- identify ways to increase the challenge of retrieval practice to further develop pupils' understanding
- understand where and how to include retrieval practice in a sequence of lessons

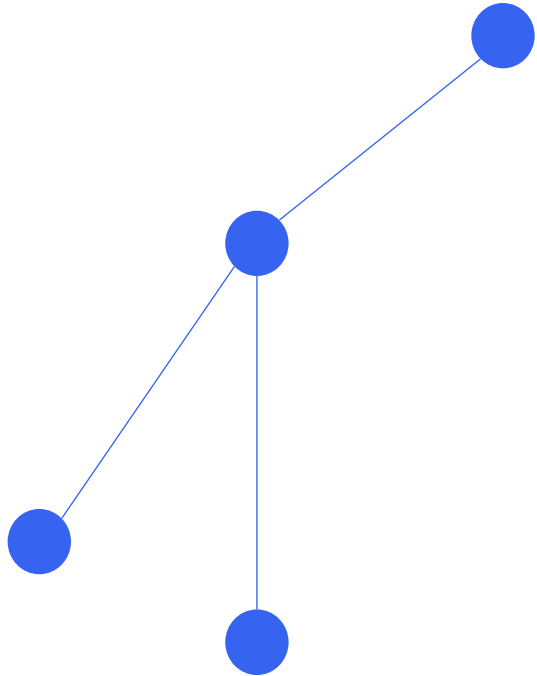
Related ECF statements

Learn that...	Learn how to...
How Pupils Learn (TS2 – Promote good progress)	
	<p>Build on pupils’ prior knowledge, by:</p> <ul style="list-style-type: none"> • Sequencing lessons so that pupils secure foundational knowledge before encountering more complex content. <p>Increase the likelihood of material being retained, by:</p> <ul style="list-style-type: none"> • Balancing exposition, repetition, practice and retrieval of critical knowledge and skills. • Planning regular review and practice of key ideas and concepts over time.

Related ECF statements

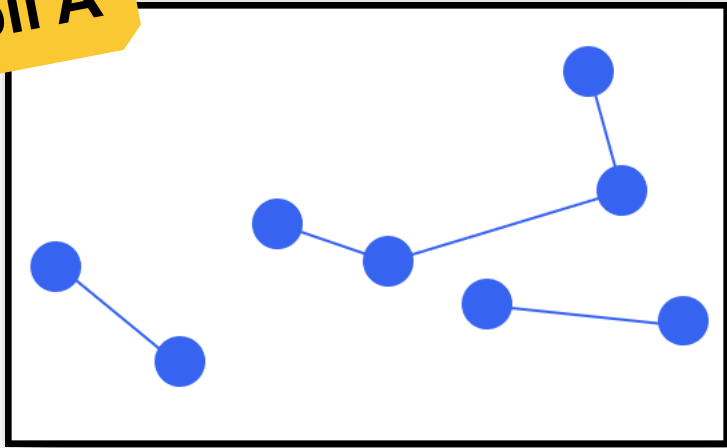
Learn that...	Learn how to...
Subject and Curriculum (TS3 – Demonstrate good subject and curriculum knowledge)	
3.7 In all subject areas, pupils learn new ideas by linking those ideas to existing knowledge, organising this knowledge into increasingly complex mental models (or schemata); carefully sequencing teaching to facilitate this process is important.	

Developing mental models

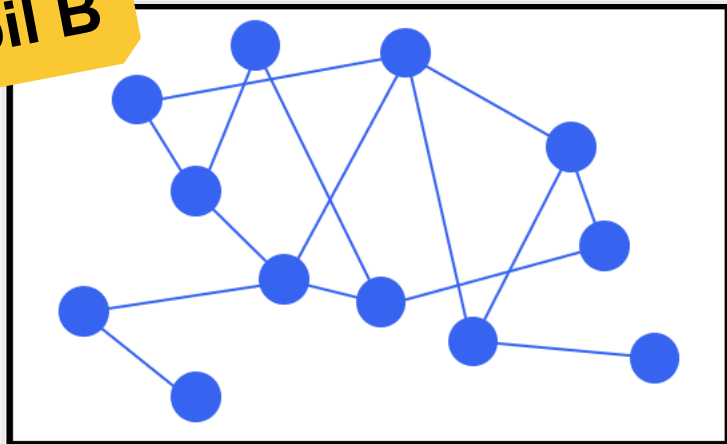


The role of prior knowledge

Pupil A



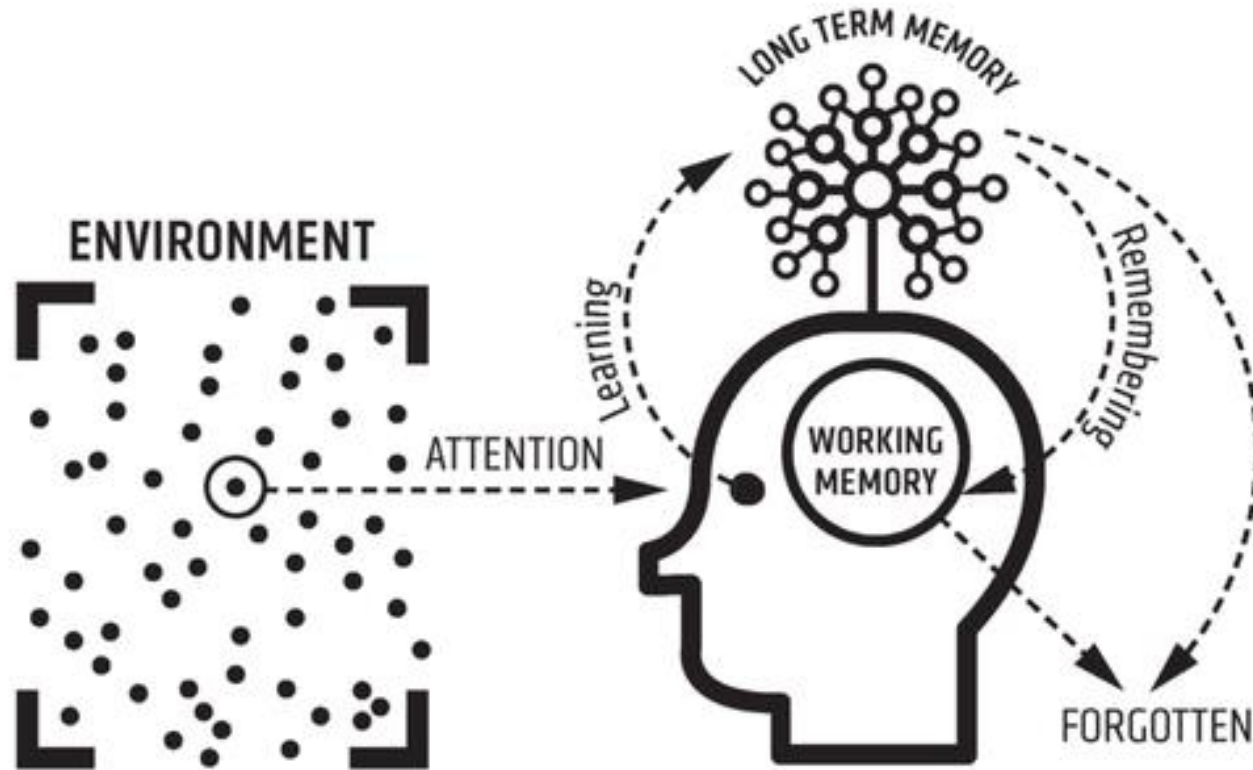
Pupil B



Discuss:

1. Which pupil do you think will be able to understand your explanations more easily and why?
2. What might have led to the differences in pupils' mental models of the number 10?
3. Can you think of an example in your own phase/subject where pupils have demonstrated different mental models of the same concept. How were they different and how did you know?

Helping pupils remember



Discuss:

What can you do to support pupils to remember?

Retrieval practice

Do Now

28/06/2022

MWBs



1. Which part of the eye contains receptor cells that are sensitive to light.
2. Which nerve carries nerve impulses from the retina to the brain?
3. Name the transparent outer layer at the front of the eye.
4. Which part of the eye controls the size of the pupil?
5. Which two parts of the eye change the shape of the lens during focusing?
6. Name the tough supporting wall of the eye?
7. Which part of the eye refracts light into the eye?



Discuss:
What makes
retrieval practice
effective?



Retrieve



Retrieve



Retrieve



Retrieve

Low stakes retrieval quizzes



Discuss:

- 1) Have you met the success criteria below. Could you improve it?
 - identify the key knowledge you want pupils to retain
 - write clearly worded questions that draw upon the key knowledge
 - ensure questions require effortful retrieval
 - write questions that require short answers so the quiz can be completed and marked quickly
- 2) What challenges did you come across when creating it? How did/could you address these?
- 3) If you have used it, was it successful? Why/why not?

Applying knowledge

Pupil mastery of content increases

Student	Score out of 13	Score out of 13	Score out of 13	Score out of 13
1	8	8	7	12
2		9	10	13
3	12	11	13	13
4	9		10	13
5	10	10	12	12
6	10.5	13	13	13
7	9	12.5	13	13
8	11	13	13	13
9	9.5	12	13	13
10	8.5	10	10	13
11	13	13	13	13
12	9.5	10.5	12.5	13
13		9	5	13
14		9	11	13
15	5	9		10



Reflect/Discuss:

1. In your practice how do you:
 - ensure pupils have the foundational knowledge they need?
 - extend pupils' learning beyond using a retrieval quiz?
2. Why do you think this is an important for developing complex mental models?

Developing mental models

Practise explaining a concept verbally in pairs

Answer questions which help pupils to connect knowledge

Apply knowledge to complete a task e.g. write a story or an essay or create a timeline

Planning



Reflect:

1. What key knowledge do pupils need to know for that topic?
2. Where can you build in low-stakes retrieval quizzes to ensure this is mastered and how will you space these?
3. What tasks can you provide pupils with to ensure they have the opportunity to retrieve and apply this information?

Tasks where pupils can apply their knowledge:

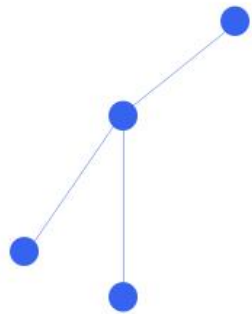
- practise explaining something verbally in pairs
- answer questions which help pupils to connect knowledge
- apply knowledge to complete a task e.g., write a story or an essay or create a timeline

Discuss and critique

1. What is the highest-leverage key knowledge that you've included in your retrieval practice? Why did you select this knowledge?
2. How many opportunities are there for pupils to retrieve this key knowledge? Is there appropriate time between each opportunity?
3. How have you varied the type of retrieval practice that pupils undertake?
4. How have you planned opportunities for application of key knowledge across different contexts to build more complex mental models?

Summary

Developing mental models



T

Applying knowledge

T

Pupil mastery of content increases

Student	Score out of 10	Score out of 10	Score out of 10	Score out of 10
1	8	9	9	10
2	7	8	8	10
3	8	9	9	10
4	8	9	9	10
5	8	9	9	10
6	8	9	9	10
7	9	9	10	10
8	8	9	9	10
9	8	9	9	10
10	8	9	9	10
11	8	9	9	10
12	8	9	9	10
13	8	9	9	10
14	8	9	9	10
15	8	9	9	10



Planning

T

Reflect:

1. What key knowledge do pupils need to know for that topic?
2. Where can you build in low-stakes retrieval quizzes to ensure this is mastered and how will you space these?
3. What tasks can you provide pupils with to ensure they have the opportunity to retrieve and apply this information?

Tasks where pupils can apply their knowledge:

- practise explaining something verbally in pairs
- answer questions which help pupils to connect knowledge
- apply knowledge to complete a task e.g., write a story or an essay or create a timeline



Thank you.

Teach First is a registered charity, no. 1098294

[teachfirst.org.uk](https://www.teachfirst.org.uk)



[@TeachFirst](https://twitter.com/TeachFirst)



[@teachfirstuk](https://www.instagram.com/teachfirstuk)

References

Chi, M. T. (2009) Three types of conceptual change: Belief revision, mental model transformation, and categorical shift. In *International handbook of research on conceptual change* (pp. 89-110).

Deans for Impact (2015) *The Science of Learning* [Online] Accessible from: <https://deansforimpact.org/resources/the-science-of-learning/>.

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013) Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest, Supplement*, 14(1), 4–58. <https://doi.org/10.1177/1529100612453266>.

Roediger, H. L., & Butler, A. C. (2011) The critical role of retrieval practice in long-term retention. *Trends in Cognitive Sciences*, 15(1), 20–27. <https://doi.org/10.1016/j.tics.2010.09.003>.

Rosenshine, B. (2012) Principles of Instruction: Research-based strategies that all teachers should know. *American Educator*, 12–20. <https://doi.org/10.1111/j.1467-8535.2005.00507.x>.

Sherrington, T. (2019) *Rosenshine's Principles in Action*. John Catt Publishing.