

# DO YOU CREATE TRAINING OR LEARNING?

## Mentor Conference

For current and future ITT and ECT mentors

Teaching School Hubs from across the East of England are delighted to welcome Deans for Impact to support our third annual mentor conference.

## Deans for Impact

Deans for Impact works to ensure all children have a well-prepared teacher. Drawing on Deans for Impact's *The Science of Learning*, this online conference will give ITT and ECT mentors a summary of scientific understanding of how students learn and ideas on how to support their mentee.

Tuesday 6th February  
2024

4:00 – 5:30pm



# Housekeeping



**Microphones** – on mute, please



**Recording the session** – please turn your camera off if you do not want to appear



**Chat function** – please use this for asking questions, and responding to requests for feedback



**Feedback** – we will be asking for volunteers to give feedback during the session

# Role of Teaching School Hubs (TSHs)

Teaching School Hubs are designated **school-led centres of excellence** for **teaching and leadership training** and **development through all aspects of a teacher's career**.

TSHs play a **significant role** in delivering **school-based initial teacher training (ITT)** and delivering the **Early Career Framework**.

Together, the TSHs represented here today cover the **East of England**.



# The Golden Thread

**Initial teacher training is the very start** of the Golden Thread.

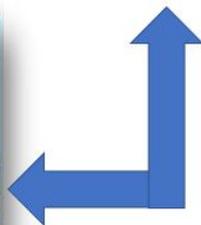
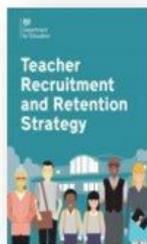
The 'Golden Thread' of teacher development runs through a teacher's whole career, supporting you throughout.

**TSHs have a significant role** in delivering on this.



# Teaching School Hubs: teacher development

## Building a world class system of Teacher Development: the DfE context



## For Schools

## For Mentors

Addressing school recruitment need

Training your own staff

Career pathways for advanced mentors

Participating in the National recruitment and retention strategy

**NEXT STEP**

To develop existing staff with current practice

To contribute to Subject teams

Exposure to new pedagogy and ideas trainees bring

Secure talent for employment

Reflect & implement

**OPTIONS**

Subject or leadership post

Induction/Professional Tutor  
ITT Lead Mentor

To develop mentors as part of their career progression

Deeper Learning

Expand Knowledge

**OPTIONS**

CPD specific to ITT Research

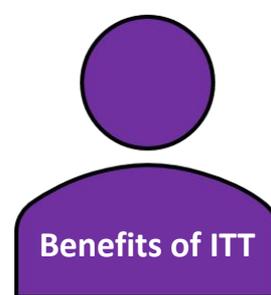
Specialist NPQs

Lead Mentor Programmes

Certificated Mentor modules

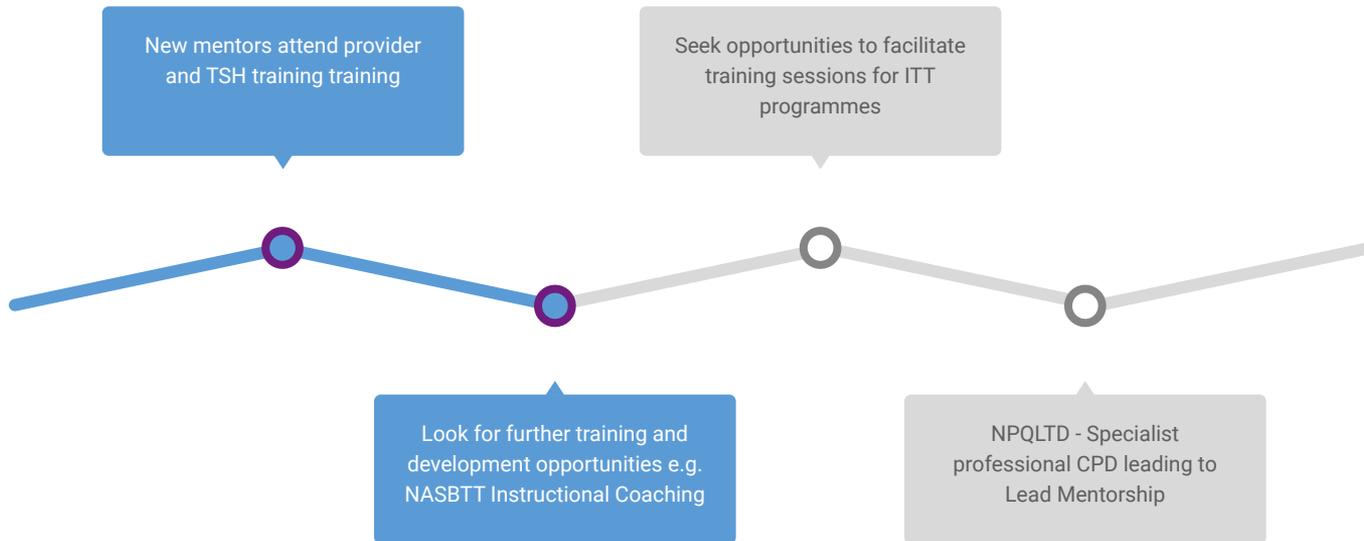
**NEXT STEP**

**Benefits of ITT**



# Example of a mentor progression model

Aim: this mentor progression continues the 'Golden Thread' throughout the stages of a teacher's career to develop their own and teachers' development to improve pupil outcomes.



# NPQs



*Contact your local Teaching School Hub if you are interested in completing an NPQ or becoming a facilitator for one.*

## NPQs available

The 5 NPQs in specialist areas of teaching have been designed with both classroom teachers and leader in mind. They are:

- [Leading teacher development](#) – learn how to become a teacher educator and successfully support teachers in your school to expand their skills
- [Leading teaching](#) – learn how to lead the teaching and learning of a subject, year group or phase
- [Leading behaviour and culture](#) – learn how to create a culture of good behaviour and high expectations in which staff and pupils can thrive
- [Leading literacy](#) – learn how to effectively teach and promote literacy across the whole group, year group, key stage or phase
- [Leading primary mathematics](#) - learn how to shape a culture of maths across your primary setting

The leadership NPQs are:

- [Senior leadership](#) – develop your leadership knowledge and expertise to improve outcomes for teachers and pupils in your school
- [Headship](#) – develop the knowledge that underpins expert school leadership and apply it to become an outstanding headteacher
- [Executive leadership](#) – develop the expertise you need to become an outstanding executive leader, leading change and improvement across your group of schools or multi-academy trust
- [Early years leadership](#) – develop expertise in leading high-quality early years education and care, as well as effective staff and organisational management

Each NPQ is underpinned by a new content framework. These frameworks set out what participants should know and be able to do after completing an NPQ. Providers have used these to design their courses.

Add your  
response to  
chat

What impact do  
great mentors  
have?





# What impact can great mentors have?

- Inspire future generations of teachers
  - Nurturing individual trainee talents and potential
  - Modelling/breaking down a complex profession in steps for the novice teacher
  - Demonstrate belief in the novice teacher to continuously improve
  - Consistency and continuity – *always being there*
-



# Deans for Impact

Researchers and practitioners with extensive experience creating and implementing teaching tools for practicing educators

Instructional support brings the **science of learning** into teaching practice, with an equity-centered focus on **early literacy**, **mathematics**, and the identification and use of **high-quality instructional materials**.

## Mentor Knowledge Audit

How confident are you in using  
Cognitive Science evidence insights  
when working with novice teachers?

Start questionnaire: use QR code or  
link in the chat or original email



## How Pupils Learn (Standard 2 – ‘Promote good progress’)

CCF

Learn that...	Learn how to...	<a href="https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/97430/7/ITT_core_content_framework.pdf">https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/97430/7/ITT_core_content_framework.pdf</a>
<p>1. Learning involves a lasting change in pupils' capabilities or understanding.</p> <p>2. Prior knowledge plays an important role in how pupils learn; committing some key facts to their long-term memory is likely to help pupils learn more complex ideas.</p> <p>3. An important factor in learning is memory, which can be thought of as comprising two elements: working memory and long-term memory.</p> <p>4. Working memory is where information that is being actively processed is held, but its capacity is limited and can be overloaded.</p> <p>5. Long-term memory can be considered as a store of knowledge that changes as pupils learn by integrating new ideas with existing knowledge.</p> <p>6. Where prior knowledge is weak, pupils are more likely to develop misconceptions, particularly if</p>	<p><b>Avoid overloading working memory, by:</b></p> <ul style="list-style-type: none"><li>• Receiving clear, consistent and effective mentoring in how to take into account pupils' prior knowledge when planning how much new information to introduce.</li><li>• Discussing and <u>analysing</u> with expert colleagues how to reduce distractions that take attention away from what is being taught (e.g. keeping the complexity of a task to a minimum, so that attention is focused on the content).</li></ul> <p><b>And - following expert input - by taking opportunities to <u>practise</u>, receive feedback and improve at:</b></p> <ul style="list-style-type: none"><li>• Breaking complex material into smaller steps (e.g. using partially completed examples to focus pupils on the specific steps).</li></ul> <p><b>Build on pupils' prior knowledge, by:</b></p> <ul style="list-style-type: none"><li>• Discussing and <u>analysing</u> with expert colleagues how to sequence lessons so that pupils secure foundational knowledge before encountering more complex content.</li><li>• Discussing and <u>analysing</u> with expert colleagues how to identify possible misconceptions and plan how to prevent these forming.</li></ul> <p><b>And - following expert input - by taking opportunities to <u>practise</u>, receive feedback and improve at:</b></p> <ul style="list-style-type: none"><li>• Encouraging pupils to share emerging understanding and points of confusion so that misconceptions can be addressed</li><li>• Linking what pupils already know to what is being taught (e.g. explaining how new content builds on what is already known).</li></ul>	
<p>7. Regular purposeful practice of what has previously been taught can help consolidate material and help pupils remember what they have learned.</p> <p>8. Requiring pupils to retrieve information from memory, and spacing practice so that pupils revisit ideas after a gap are also likely to strengthen recall.</p> <p>9. Worked examples that take pupils through each step of a new process are also likely to support pupils to learn</p>	<p><b>Increase likelihood of material being retained, by:</b></p> <ul style="list-style-type: none"><li>• Observing how expert colleagues plan regular review and practice of key ideas and concepts over time (e.g. through carefully planned use of structured talk activities) and deconstructing this approach.</li><li>• Discussing and <u>analysing</u> with expert colleagues how to design practice, generation and retrieval tasks that provide just enough support so that pupils experience a high success rate when attempting challenging work.</li></ul> <p><b>And - following expert input - by taking opportunities to <u>practise</u>, receive feedback and improve at:</b></p> <ul style="list-style-type: none"><li>• Balancing exposition, repetition, practice and retrieval of critical knowledge and skills.</li><li>• Increasing challenge with practice and retrieval as knowledge becomes more secure (e.g. by removing scaffolding, lengthening spacing or introducing interacting elements).</li></ul>	

## How Pupils Learn (Standard 2 – ‘Promote good progress’)

[Further reading recommendations are indicated with an asterisk.]

Adesope, O. O., Trevisan, D. A., & Sundararajan, N. (2017) Rethinking the Use of Tests: A Meta-Analysis of Practice Testing. *Review of Educational Research*, 87(3), 659–701. <https://doi.org/10.3102/0034654316689306>.

Agarwal, P. K., Finley, J. R., Rose, N. S., & Roediger, H. L. (2017) Benefits from retrieval practice are greater for students with lower working memory capacity. *Memory*, 25(6), 764–771. <https://doi.org/10.1080/09658211.2016.1220579>.

Allen, B. and Sims, S. (2018) *The Teacher Gap*. Abingdon: Routledge.

Baddeley, A. (2003) Working memory: looking back and looking forward. *Nature reviews neuroscience*, 4(10), 829-839.

Black, P., & Wiliam, D. (2009) Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, 21(1), pp.5-31.

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). Routledge.

Clark, R., Nguyen, F. & Sweller, J. (2006) *Efficiency in Learning: Evidence-Based Guidelines to Manage Cognitive Load*. John Wiley & Sons.

Cowan, N. (2008) What are the differences between long-term, short-term, and working memory? *Progress in brain research*, 169. 323-338.

\*Deans for Impact (2015) *The Science of Learning* [Online] Accessible from: <https://deansforimpact.org/resources/the-science-of-learning/>. [retrieved 10 October 2018].

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>.

\*Education Endowment Foundation (2018) *Improving Secondary Science Guidance Report*. [Online] Accessible from: <https://educationendowmentfoundation.org.uk/tools/guidance-reports/> [retrieved 10 October 2018].

# Key summary CCF reading



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

## TAKE-AWAY

The summary looks at six questions about learning, giving a quick summary of the science and some ideas about how they might apply in schools and classrooms.

### 1. How do students understand new ideas?

- The importance of prior knowledge and the bottle-neck of working memory

### 2. How do students learn and retain new information?

- Getting students to think about meaning and giving them sufficient practice through things like low-stakes quizzing

### 3. How do students solve problems?

- Automating the recall of key knowledge to reduce the load on working memory and giving specific feedback related to improvement

### 4. How does learning transfer to new situations?

- Ensuring background knowledge is sufficient and secure, and focusing students on the deep structure of similar problems

### 5. What motivates students to learn?

- Beliefs about intelligence, the care with which we must use praise or rewards, improving student judgements of learning, and reassurance about belonging

### 6. What are some common misconceptions about how students think and learn?

- Students don't have learning styles, popular neuromyths like left/right brained learners, there aren't 'stages' of development, there are differences between novices and experts, and other misconceptions and pseudoscientific ideas surrounding learning

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# Outline of the Session

- How Teachers Use Cognitive Science to Design Instruction
- Myths About Learning
- A Model of the Mind
- Summary, Reflection, and Questionnaire

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# What does equity in learning look like in your classroom?

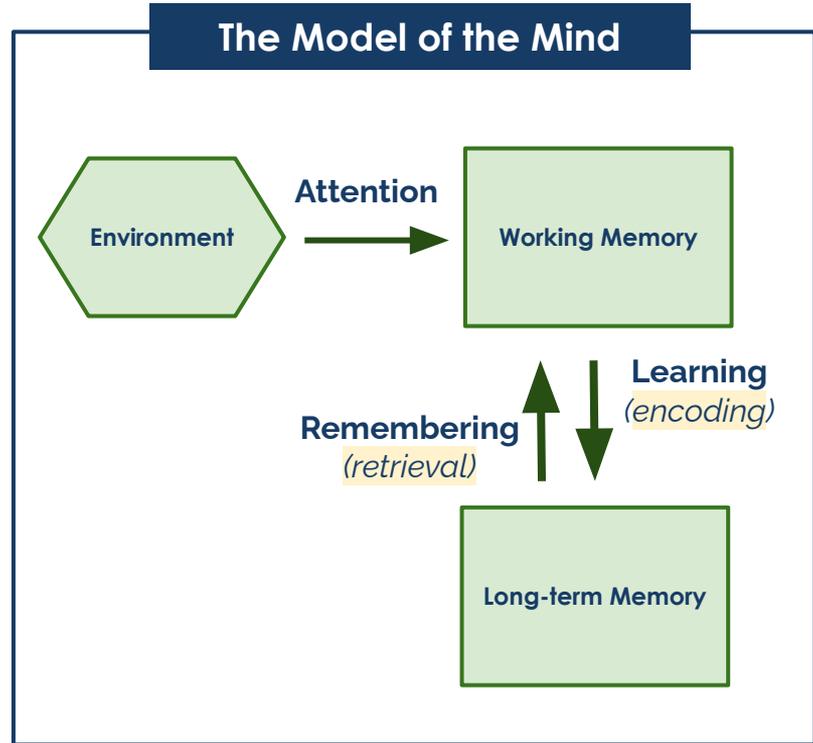
Please reflect and give an example in the chat of what equity looks like in your classroom.

Add your  
response to  
chat

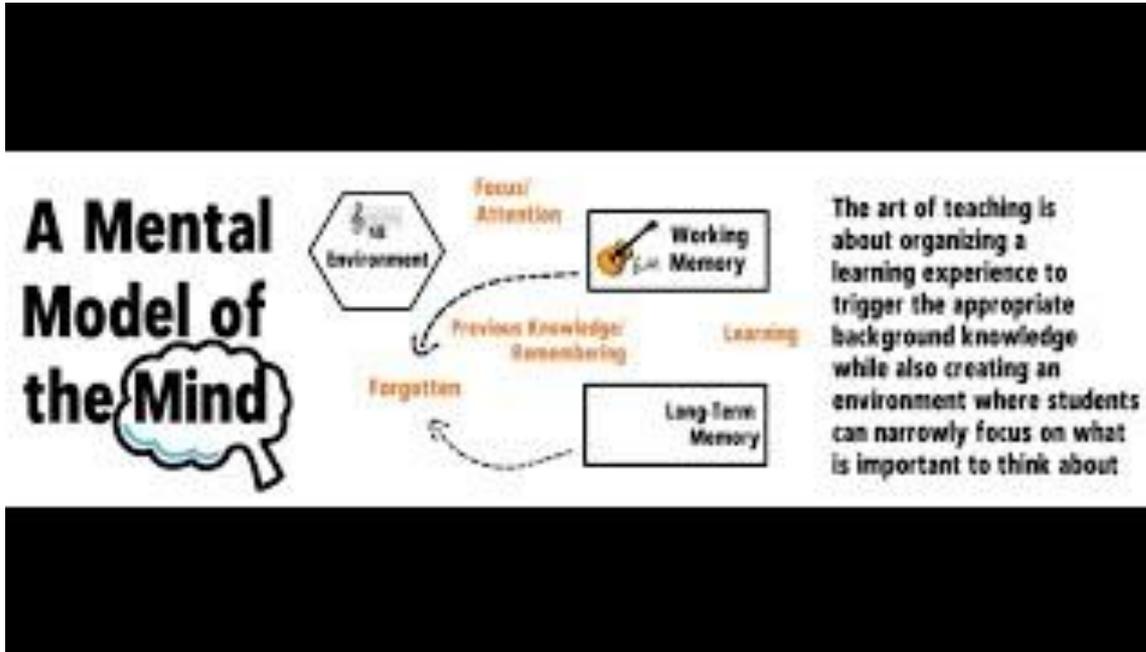
# Model of the Mind

As you watch, consider:

- How would you describe the role of attention, encoding, and retrieval in long term learning? Why do these matter?
- Make notes as you watch



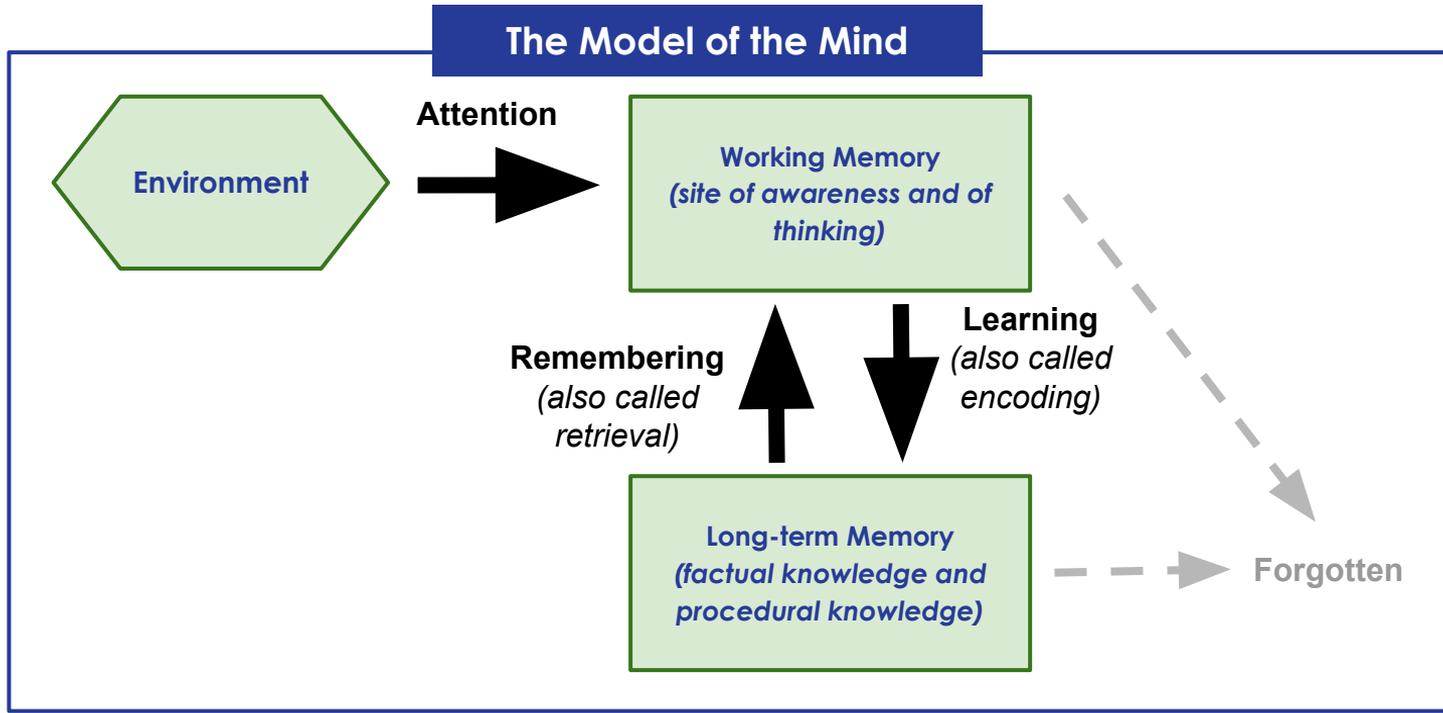
# Video 1: A Model of the Mind



As you watch, consider:

- What is the difference and relationship between encoding and retrieval? How are they each related to building enduring understanding?
- What common misconceptions do ECTS or trainees present about the learning process?

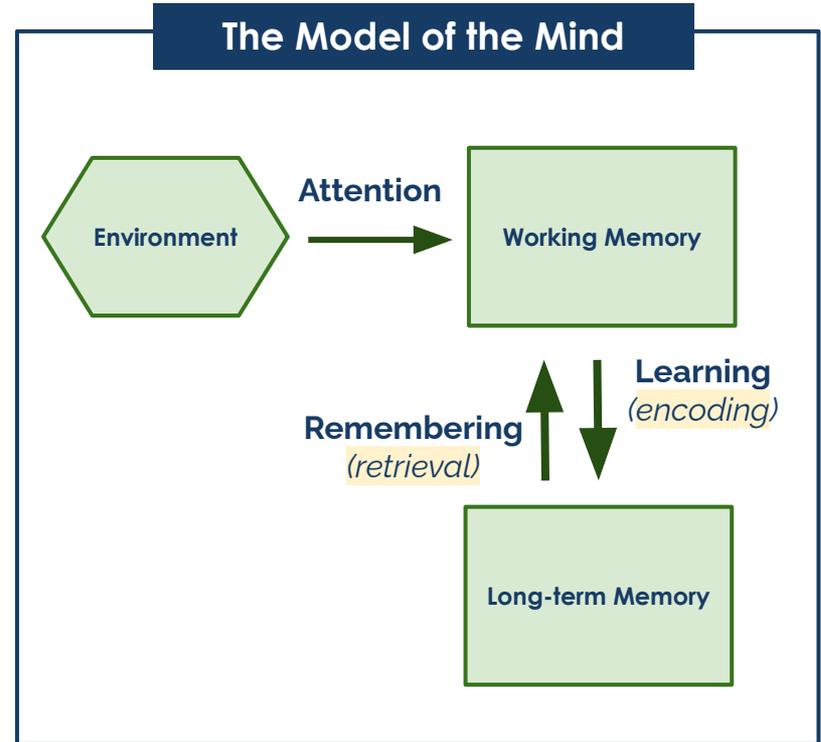
# Examine this model of how the mind works



# Encoding vs. Retrieval

**Encoding is how we "learn" something.** It describes how information is moved from working memory (where it can be easily overloaded or lost) INTO long-term memory (our unlimited storage bank of concepts, facts, and memories).

**Retrieval** describes the opposite process, **how we pull information OUT of long-term memory to use while thinking.**



# Examples of Encoding vs. Retrieval

Add your  
response to  
chat

For example, if my teacher teaches me that plants use sunlight and water to convert carbon dioxide and water to oxygen during photosynthesis, I can **encode this information in long-term memory**.

The next week, if my teacher asks if photosynthesis occurs during the day or night, **I can recall (or "retrieve") the fact that the process requires sunlight out of my long-term memory into working memory to make sense of the question and answer, "During the day!"**



Retrieval by Oliver Caviglioli.  
From Dr Yana Weinstein and Dr Megan Sumeracki's 2018 book  
Understanding How We Learn, illustrated by me and published by David  
Fulton/Routledge. Retrieved from: olicav.com

# How encoding and retrieval support learning



Willingham's Model of the Mind, by Oliver Caviglioli.  
Retrieved from: olicav.com

Both encoding and retrieval are **essential for building enduring understanding**.

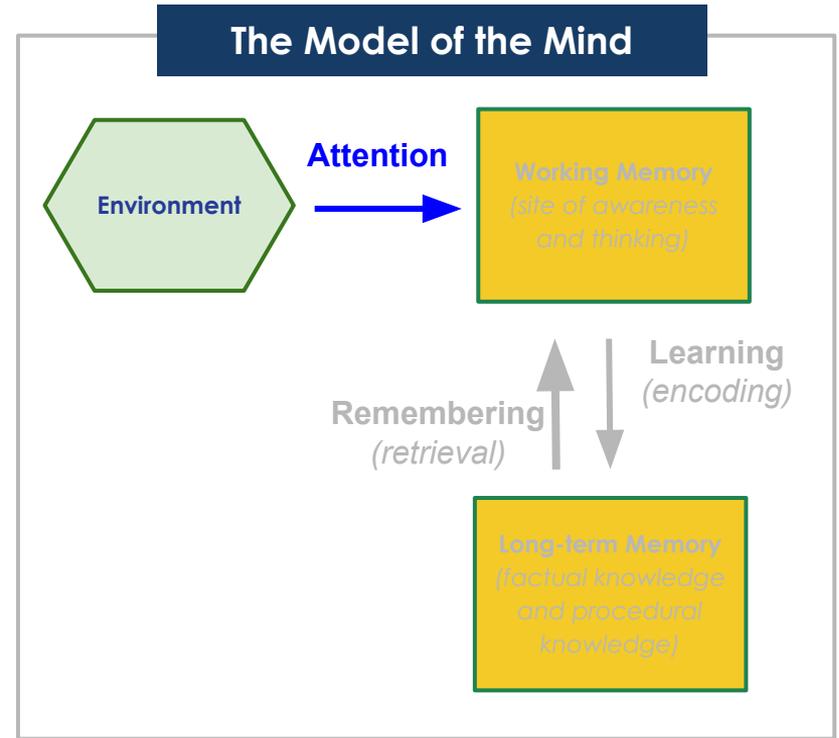
We have to **first encode something in long-term memory** to remember it and build on that understanding later.

Retrieval is one way we can deepen understanding over time. **The more we retrieve information, the more durable our learning becomes.** If we don't practice retrieving it, the memory trace can decay and we can't access the information anymore (forgetting).

# The Role of Attention - Classroom Example

**Attention** is a resource, the more **attention** you pay to one thing, the less you can pay to another.

In the chat function, add examples of what else could be competing for students' attention in a lesson.

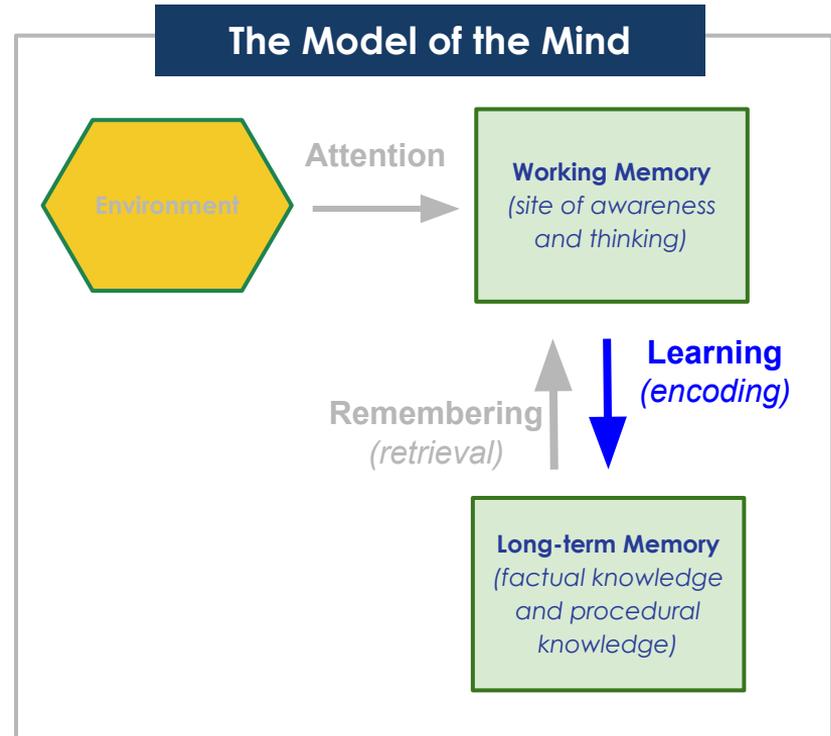


# The Role of Attention - Classroom Example

You can only **encode (learn)** information into **long-term memory**, that first makes it into **working memory**.

This is why it's a problem if the student gets distracted by the long rambling tangent about the weather, instead of the diagram depicting photosynthesis – and the teacher's tasks and questions never refocus their attention.

The teacher's tangent, rather than photosynthesis is what will get **encoded** into **long-term memory**.



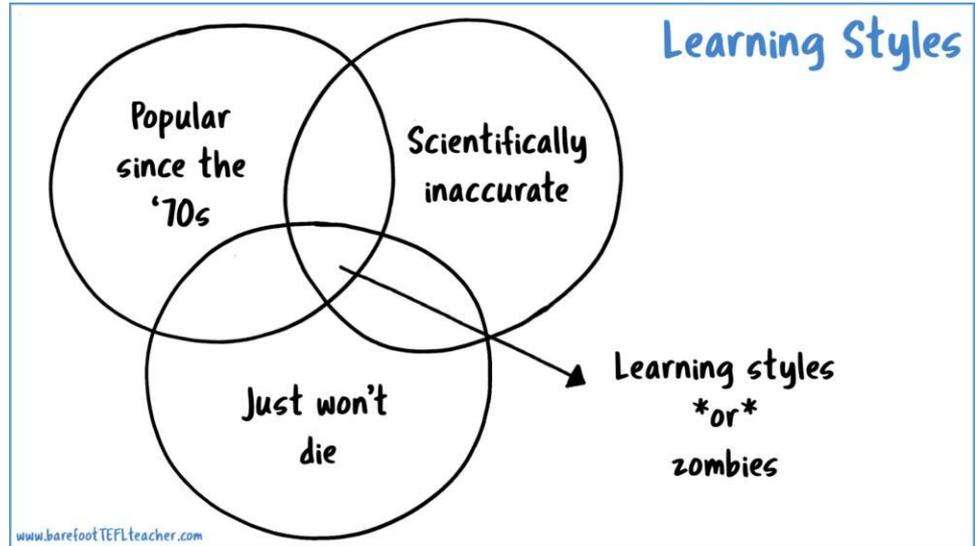
# Common Myths About Learning

Add your  
response to  
chat

On the next slide, you'll watch a short video about common 'neuromyths' – or incorrect beliefs about learning.

As you watch, consider:

- What ideas about learning did you have that changed or were reinforced by the video?
- Put your ideas in the chat



By David Zeller, Retrieved from:  
<https://barefootteflteacher.com/the-learning-styles-myth-60304a981281>

# Video 2: Myths About Learning

## MYTHS ABOUT LEARNING

**MYTH #1:**  
PEOPLE LEARN BETTER IN THEIR PREFERRED LEARNING STYLE  
Research does not support this idea.



Belief in learning styles can be detrimental to student growth



THE TYPE OF ENGAGEMENT MATTERS LESS THAN THE TYPE OF THINKING STUDENTS ARE DOING

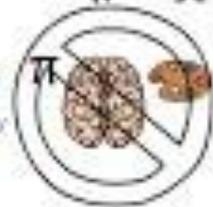
**Matching the learning experience with the desired outcome**



For students to be able to write about something → 

For students to be able to discuss topics using evidence → 

**MYTH #2:**  
SOME PEOPLE ARE MORE 'LEFT-BRAINED' AND OTHERS ARE MORE 'RIGHT-BRAINED'



# How has your thinking changed?

The question asked about your personal opinion. We wanted to name that if the content of the video surprised you, you aren't alone.

Many teacher-candidates are surprised to find there is no evidence to support the idea of "learning styles" or "right-brained vs. left-brained" learners.

To the contrary, all people benefit from learning with a variety of modalities that are well matched to the content (v), and all learners especially benefit from strategic visual supports, such as images, diagrams, and charts.

Raise your hand if your thinking has changed



By Wellness360. Retrieved from:  
<https://medium.com/swlh/neuromyths-the-10-top-misconceptions-about-your-brain-51675a4f4c4f>

# Examining a Lesson Scenario

Teacher A and Teacher B are both teaching a year 11 History lesson with the objective:

*Students will be able to describe the similarities and differences between Dr. Martin Luther King and Malcolm X.*

As you read their lesson scenarios, consider which will better prepare students to meet that learning goal.



# Let's look at this scenario: Teacher A

**TEACHER A** gives a **brief lecture** on what Dr. King and Malcolm X are known for and emphasizes that they were both assassinated. The teacher then sets up two stations for students to choose from, based on their preferred modality:

At Station A, students will get to watch **short video clips** of each leader giving a speech: “I Have a Dream” for Dr. King and “The Ballot or the Bullet” for Malcolm X. Students discuss their favorite line from each speech.

At Station B, **students will listen and read the lyrics of two different songs**: “We Shall Overcome” and “Fight the Power”. Students discuss the best lines or stanzas from each song.

To debrief, individual students raise their hands to **share what stood out to them about the two leaders** from class.

## Let's look at this scenario: Teacher B

**TEACHER B** has students **read excerpts from two texts**, “Letter from a Birmingham Jail” by Dr. King and “By Any Means Necessary” by Malcolm X.

The teacher asks students to **work with a partner to identify evidence** to describe the theories of change that motivated each leader.

Then, the whole class watches **brief video excerpts** of the “I Have a Dream” for Dr. King and “The Ballot or the Bullet” for Malcolm X, and work again with their partner to **identify evidence of their theories of change** in the video clips.

Finally, students are asked to **compare if the leaders are similar or different** with regard to 1) the goals they aim for, and 2) the strategies they used to achieve those goals. Independently, students **write comparison paragraphs**. The class closes with a whip-around debrief where each student shares a quick reflection on the leaders’ approaches.

# Reflection time - Reflect on the Lessons

Add your  
response to  
chat

**In which class are students more likely to demonstrate mastery of the learning goal:**

“Describe the similarities and differences between Dr. Martin Luther King Jr. and Malcolm X”?

**What might be the effects of these different lessons on equitable learning outcomes?**

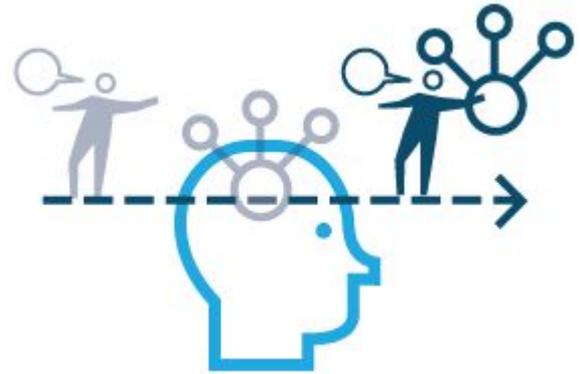
*Justify your answer using information from the videos.*



# Which teacher is more likely to support effective learning? Why?

Teacher B's lesson is more likely to get students to meet the objective.

Teacher B has directly matched what students are doing (discussing and describing in writing the goals and theory of change of each leader based on an analysis of primary source documents) to the objective (describe the similarities and differences of Dr. Martin Luther King and Malcolm X).



Feed Forward by Oliver Caviglioli.  
From the CRAFT model created by Michael Chiles and his school the  
Ormiston Bolingbroke Academy. Retrieved from: olicav.com

# Which teacher is more likely to support effective learning? Why?

Teacher A's lesson does not align as clearly to the objective. Students are shown a variety of media and then asked for their favorite lines, and what "stood out to them." While what they share could be relevant to the learning goals, it also could be totally unrelated.

One way of interpreting Teacher A's lesson is that they are trying to meet the needs of both their "visual" and "auditory" learners by allowing them to choose their preferred modality. However, there is no evidence "auditory" or "visual" learners exist, or that teaching in this way will lead to increased learning. Instead, research suggests that teacher should match the way they teach to the outcome they hope to see.

# Summary: Use with Trainees/ECTs

- **Learning styles and left brain/right brain are neuromyths.** Individual students do not learn better by being matched to visual, auditory, or kinesthetic learning experiences. People do not have a dominant brain hemisphere.
- **Attention is a finite resource.** We cannot “multitask,” we simply input different information into our limited working memory.
- **If students don’t first encode information, they can’t retrieve it later.** Teachers have a major role in supporting ALL students in paying attention to and ultimately encoding the knowledge and skills they need to meet grade-level learning goals.
- When we “retrieve” something, we are pulling up information from where it is stored in long-term memory. **We draw on what we already know to make sense of new information. Retrieval builds durable, long-lasting learning,** reinforcing pathways in long-term memory for that information and prevents “decay,” or forgetting.

# Mentor Knowledge Audit & Evaluation feedback

We welcome your thoughts on the session.

End questionnaire: use QR code or link in the chat.

