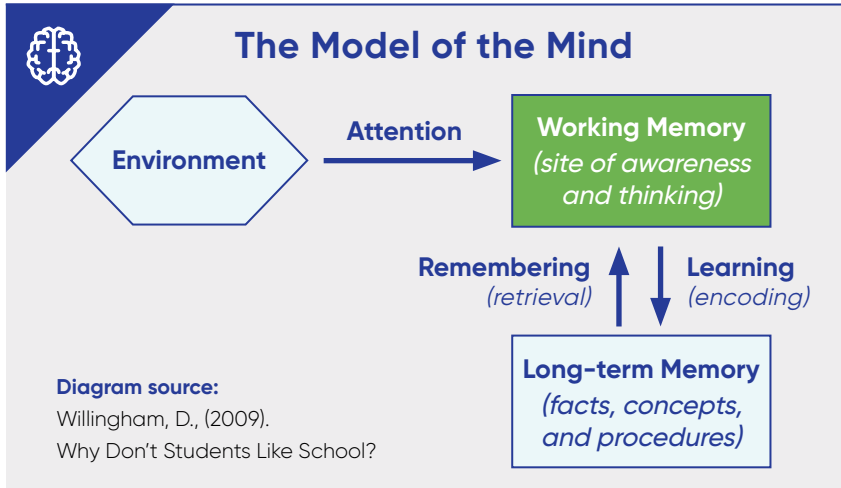




Prompting for Effortful Thinking

This resource from DFI's [Learning by Scientific Design Network](#) provides practicing teacher-educators with an overview of a learning science-informed teacher action. To access additional materials, visit deansforimpact.org/resources

Teachers' questions and tasks require students to engage in effortful thinking



Effortful thinking is the core of learning. How hard we think about something influences how well we actually learn it.

Teachers can prompt deeper, "effortful" thinking with *elaborative* questions and tasks that cue thinking about relationships between ideas. These prompts often start with "how" or "why". Effortful prompts help teachers check for understanding, but their core purpose is to promote learning, so students *encode more deeply and durably* into long-term memory.

Why does prompting effortful thinking matter for students?

If students are not given equitable opportunities to think effortfully and thus store their learning durably, then they may struggle to understand not only current concepts, but also new concepts building on those concepts, a gap that compounds over time and exacerbates inequities in learning.

Deeper, more durable learning also unlocks more enjoyable learning. Students who engage the full richness of concepts can enjoy the motivation and gratification that comes with deeper learning.

What does this look like in the classroom?



Analyze and Justify

Prompt students to analyze, justify, and explain to-be-remembered ideas

Teachers should assess what students are thinking about at each point in the lesson and ensure that the questions and tasks students complete drive them to think deeply about *aligned* content.



Space and Time

Space effortful prompts and prioritize instructional time to ensure students have time to process them

Instructional time is limited, so teachers should plan in advance the most important points *throughout* the lesson where students should pause and think about key ideas deeply before moving on.



All Learners

Offer prompts to all, not just some, students

When only a subset of students (or no students) are offered the chance to think effortfully, the rest of the class misses essential learning opportunities. Stop and jots or turn and talks ensure all students do the thinking.

Common pitfalls novice teachers fall into



Checking the Box Questions

Questions as a way to 'get through the lesson,' with the teacher moving on as soon as someone 'gets the answer'.

- **Might look like:** A teacher reads a text excerpt and asks "And this is an example of *what* part of a story's structure?" and takes hands until one student says "rising action, leading up to the climax" then moves to the next excerpt.
- **Try instead:** The teacher says "take a moment and jot your thinking: what part of the story's structure did we just read? How do you know?"



One-Word-Answer Questions

Questions that start with 4 W's (Who, What, When, Where), but no Why or How questions. Students don't need to think further than recalling a short answer.

- **Might look like:** A teacher teaching about adding fractions asks "And so what part should we look at first?", waits to hear "denominator!", then asks "So these fractions have different denominators. Can we add the numerators together right now? Thumbs up if yes, thumbs down if no." Students put thumbs down and teacher says "Correct!"
- **Try instead:** The teacher says, "For these two fractions, explain to your partner what part you start by looking at first and why." After listening to answers, asks "What do we need to do next to add these fractions? How do you know?"



Teacher Bow Tie

Teacher may answer their own questions or rephrase student responses in ways that cue the answer, so not all students are able to think deeply and process their ideas. They take strands of incomplete student thinking and tie them off neatly.

- **Might look like:** A teacher asks "what part of a story structure is this?" and a student says "rising action." Teacher responds, "Exactly! When we find out that his sworn enemy is still alive, we've increased tension and are leading to the story climax. That's what the rising action does."
- **Try instead:** Teacher asks "What part of a story structure is this?" and a student says "rising action." The teacher responds, "And how do you know? Tell your partner: what aspect of what we read fits with a definition of a rising action?"



Question Dress-Up

Questions that might seem effortful, but don't engage students in deep processing. These may shift students away from the key idea ("What did you do next?" or "Who else noticed something?") or ask recall questions disguised with higher-order verbs ("Create a list of words.").

- **Might look like:** In a lesson on adding fractions, the teacher asks a student, "Analyze the denominators. Do they match?" Student says no, and teacher says "Great, so what did you do next?"
- **Try instead:** Teacher asks, "Why did you decide to multiply the denominators?"