SCIENCE OF LEARNING: TIPS FOR OBSERVING AND COACHING

Prompting for Effortful Thinking

Deans for Impact

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

Look for Questions and tasks prompt students to analyze, justify,and provide detailed explanations of key content

Why it's important to prompt for effortful thinking:

Prompting for effortful thinking requires students to think deeply about content, supporting the movement of ideas from working memory to long-term memory where it will not be easily forgotten. Because learning new information is so intimately tied to prior knowledge, the cost for learners who lack access to effortful thinking opportunities compounds as they proceed through material.

SUGGESTED NEXT STEP: Support the teacher to identify the core content aligned to the learning goal and design effortful prompts or tasks that ask students to analyze or justify.

Look for Prompts for effortful thinking are posed each time students encounter important ideas that should be remembered

Why it's important to prompt in close proximity to key content:

The larger the gap between when students encounter new information and when they think effortfully about it, the more likely it is to be lost from working memory and less likely it is to be stored durably in long-term memory. Frequent prompts that require deep processing ensure all students have opportunities to store important information that they can draw on in the future.

SUGGESTED NEXT STEP: Support teachers to identify places in the lesson where key ideas related to the learning goal are introduced and draft prompts that require deep processing.

Look for Prompts for effortful thinking are offered to all, not just some, students

Why it's important to provide prompts that engage all students in effortful thinking:

Teachers tend to pose effortful thinking prompts less often to girls and students of color. If students are not given equitable opportunities to think effortfully, they may struggle to understand both current concepts and ideas that build on them, a gap that compounds over time and exacerbates inequities in learning.

SUGGESTED NEXT STEP: Support the teacher to include structures that ensure all students, not just the few with raised hands, deeply think about the key content.

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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.'

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.

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.

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.").

Strategies to engage students in effortful thinking

Everyone TALKS

- **Turn and Talk.** Allows students to test out thinking before class activities resume.
- **Table Talk.** Students get to hear from more than one person.
- **Stand Up Pair Up.** Creates opportunities for movement during the class period by allowing students to discuss with a partner.

Everyone WRITES

- **Chalk Talk.** Fosters a 'silent discussion' among students, allowing for significant think time, equity of 'voice,' and a safe space for risk-taking.
- **Stop and Jot.** All students have processing time before discussion with peers.
- **Whiteboards.** Allows students to quickly write, erase, and rewrite what they're working on. This protocol allows students to do effortful independent thinking before showing work to the class.