**Asking Questions to Guide Thinking Rubric**

**Learning Objectives:**

- **Explain** why guiding with questions enhances student reasoning and problem-solving skills.
- **Identify** effective questioning strategies that focus on process, reflection, and exploration.

**Research Recommendation(s)**
Research shows that asking questions to guide thinking promotes **deeper understanding and problem-solving skills**. Questions that encourage students to explain their reasoning or explore alternatives foster **metacognition**—thinking about their own thinking. This process helps them identify gaps, strengthen knowledge, and develop flexible strategies (Chi et al., 1997; Dillon, 1975).

For these reasons, In the scenario above, the most effective strategy is:

*"Matthias, what is another operation we should do first before dividing?"*

A recent study of *Tutor CoPilot*, a human–AI system that provides tutors with real-time, expert-like guidance during live tutoring sessions, offers further evidence on effective tutor actions. Tutors who guided with reflective questions and prompts were more likely to use high-quality teaching practices that engaged students productively. Importantly, less-experienced tutors using these strategies helped their students achieve up to 9 percentage points higher mastery rates compared to those in the control group (Wang et al., 2024).

**Effective guiding questions should:**

- Be open-ended to encourage detailed responses.
- Focus on the process, not just the answer.
- Be non-judgmental to create a safe space for students to share their thoughts.
- Encourage students to reflect on their reasoning and explore alternative methods.

**Here are some examples of effective questions:**

- *Why did you choose this approach to solve the problem?*
- *What would happen if you tried a different method?*
- *How does this step connect to the overall solution?*
- *What would you do differently if you encountered a similar problem?*

**Research Recommendations**

Research supports the use of thoughtful, open-ended questions to guide students' thinking. This approach not only deepens understanding but also fosters confidence, flexibility, and persistence. By consistently asking reflective questions, tutors help students see that learning is about process as much as answers, setting them up for long-term success in problem-solving (Chi et al., 1997; Dillon, 1975).

For this reason, the best response to the above scenario is:

"Tvisha, if the total area was 120 square units with the same length, what would be the width?"

This type of question is effective because it encourages the student to reflect on their reasoning, expand their thinking, and explore alternative approaches. Over time, consistently guiding students with questions like these helps them become more independent learners who can monitor their own thinking, catch errors, and adapt strategies when needed.

PREDICT RESPONSES

**Tutor responses need to:** Be open-ended and encourage reflection.

Correct (1): Tutor asks open-ended questions and encourages the student to reflect or consider alternative approaches.

Incorrect (0): Tutor asks questions with simple answers that don't give the student space to think on their own.

| **Tutor response:** | **Rationale** |
|---|---|
| You've got this, Tvisha! What would be the case if the area was 50 square units? | 1 Asking the student to re-apply their logic to a slightly different situation supports flexible thinking. |
| Matthias, nice effort so far! Is there any other operation you should do before dividing? | 1 This question is open-ended enough while still guiding the student toward the next step in the process. |
| I would ask him what he would get after dividing by 4. | 0 This is a simple, closed-answer question that does not encourage reflection. |
| Do we want to try other questions | 0 This just changes the subject, and does not guide the student through the question they are on. |
| Do you have any questions about the method? | 0 This question is not open-ended, and doesn't necessarily require the student to reflect to answer it because they can just say "no." |

EXPLAIN RESPONSES

**Tutor responses need to:** Focus on the importance of open-ended, guiding questions to help the student learn independent reasoning skills.

Correct (1): The tutor's response demonstrates that the tutor understands the importance of open-ended questions to encourage reasoning.

Incorrect (0): The tutor doesn't demonstrate an understanding of the importance of open-ended questions to encourage reasoning.

| **Tutor response:** | **Rationale** |
|---|---|
| This question helps Tvisha apply her reasoning to a new situation, reinforcing her understanding instead of just memorizing a formula. | 1 This correctly points out that applying reasoning to a new situation deepens understanding. |
| Suggesting easier problem to solve offers students to think in steps. | 0 Suggesting an easier problem does not offer the student a chance to reflect on what they were doing in the current problem. We want to encourage students to work through difficulty, not just move on. |
| This will best guide the student's thinking because it will encourage her to think critically about why she took the steps she did. | 1 This answer emphasizes critical thinking and is process-focused. |
| Make him approach the problem in a correct manner. | 0 Guiding questions aren't just about getting the answer correct, it's about fostering independence and keeping the student process-focused. |