Rubric 4: Knowledge of Applicable Instructional Strategies and Tools; Item X (E-F)

Applicable for Items 1, and 4

Note: Some responses overlap between E and F, therefore we recommend reading responses for both E and F before scoring the teacher's response on Rubric E and on Rubric F

Rubric (E): What instructional strategies and/or tasks would you use during the next instructional period to address … miscoception(s) (if any presented)? Why?

Level	Characteristics Did the instructional strategies and/or tasks have potential to engage students in rigorous thinking about challenging content?
4	A. The instructional strategies and/or tasks proposed by the teacher have the potential to engage students in exploring and understanding: • the concept of trapezoid, OR different approaches for finding the area of a trapezoid, • generating a formal derivation of the formula for the area of a trapezoid **AND** B. The task must explicitly prompt for evidence of students' reasoning and understanding.
3	**Need to Choose C AND (D or E) AND (F)** C. The instructional strategies and/or tasks have the potential to **engage students in complex thinking** or in creating meaning for mathematical concepts, procedures, and/or relationships. However, the task does not warrant a "4" because the task does not explicitly prompt for evidence of students' reasoning and understanding. **AND** D. The focus of the task is on developing the concept of Trapezoid (e.g. prompts students to consider examples and non-examples, sort different types of trapezoids**…)** **OR** E. The focus of the task is developing different approaches for examining and deriving the area of a trapezoid **AND** F. Variety of answers for each item is provided
2	**Need to Choose (D or E) AND (G or H)** D. The focus of the task is on developing the concept of Trapezoid (e.g. prompts students to consider examples and non-examples, sort different types of trapezoids…) OR E. The focus of the task is developing different approaches for examining and deriving the area of a trapezoid. **AND** G. There is ambiguity about what needs to be done and how to do it. **OR** H. The instructional strategies and/or tasks do not require student to engage in cognitively challenging work; the tasks are easy.
1	I. The proposed instructional strategy and/or task does not address the challenge presented by the student **OR** J. The potential of the instructional strategies and/or tasks are limited to engaging students in reproducing or memorizing formulas, or definitions or rules. (e.g., "I would add a review of the area formulas for polygons to my next instructional period to reinforce the importance of the area of the trapezoid…") **OR** K. Focus of the instructional strategies and/or tasks appears to be on producing correct answers rather than developing mathematical understanding. **OR** L. Focus of the task is what is teacher is doing and showing. (e.g., group 4 B. V. 1(d) post) **OR** M. The instructional strategies and/or tasks require no mathematical activity; **OR** It is unclear what is the mathematics addressed in the proposed task/activity
0	N. Teacher did not propose instructional strategies and/or tasks. **OR** O. There is a mathematical error presented in the task
MD	Missing Data

Rubric (F): If applicable, how would you use technology or manipulatives to address …misconception or misunderstanding?

Level	Characteristics At what level did the teacher intended to use technology or manipulatives to guide students?
4	A. Teacher proposed that students use technology or manipulatives in exploring and understanding the nature of mathematical concepts, and/or relationships, that: • depends on a perceived misconception; • engages students in using complex and non-algorithmic thinking related to the concepts of trapezoid and the area of the trapezoid For example, students may be invited to: • use technology or manipulatives to make students' misconception evident; • explain why their previous strategies would not work; • make conjectures and support conclusions related to the concept of trapezoid with mathematical evidence; • make conjectures and support conclusions related to the concept of area of a trapezoid with mathematical evidence; • identify patterns and form generalizations based on these patterns
3	B. Teachers understands what technology or manipulatives can be used and what are the appropriate ways to use these in the activity. They have actually considered the case for which they are suggesting the use of technology. (Saying, "students should use GSP or GeoGebra to do the activity" is not sufficient). **AND** C. Teacher proposed that students use technology and/or manipulatives to engage in complex thinking or in creating meaning for geometric concepts, procedures, and/or relationships. However, the implementation does not warrant a "4" because: • There is no explicit dependence on a perceived misconception in students' reasoning and understanding of the trapezoid and the area of the trapezoid. • students would engage in doing mathematics or procedures with connections, but the underlying mathematics in the task would be too easy or too hard to sustain engagement with high-level cognitive demand).
2	D. Teacher proposed that students use technology or manipulatives to engage in a task that is relevant but not cognitively challenging (task designed for the visualization level on V-H scale would be an example of this). **OR** E. The task is to easy **AND** F. There was an ambiguity about what needs to be done and how to do it. **OR** **G.** Focus of the implementation appears to be on producing correct answers rather than developing mathematical understanding (e.g., applying a specific problem solving strategy, practicing a computational algorithm).
1	**H.** Students would not engage in mathematical activity, or would not be actively engage in using technology or manipulatives (teacher is demonstrating) **OR** I. Teacher proposed that students use technology or manipulatives to engage in a task that is NOT relevant to the presented misconception (e.g. "Using graph paper is a good resource because you can clearly define an area") **OR** K. Teacher proposed that students use technology or manipulatives to engage in memorizing or reproducing definitions, procedures, facts, rules, formulas.
0	L. Teacher did not propose that students use technology or manipulatives **OR** M. The teacher's response is superficial
MD	Missing data