

Appendix C:
Final Version of the PAM Scoring Rubric

Final Version of the PAM Scoring Rubric

| Category | Indicator/ Competency | Target Performance Fully Met- 3 (Pass) | Partially Met-2 (Pass) | Not Met-1 (Remediation) | No Response-0 (Remediation) |
|----------------------------|---|---|--|--|--|
| Content knowledge | Problem Solving, Mathematical Language, and Skills | Content knowledge is demonstrated in the following ways: A correct solution to the problem is provided. Appropriate mathematical symbolism, diagrams and terminology are used. A complete explanation of the solution to the problem is provided. Polya's 4-step problem-solving strategy is explicitly related to the problem/task. | A correct solution to the problem is provided. Some symbols, diagrams or terms are inappropriate or not used correctly. Some of the explanations to solve the problem are missing. The problem solving process is used, but is not explicit. | An incorrect solution to the problem is provided. There is consistent misuse of terms, symbols or diagrams throughout the solution. Most of the explanations for solving the problem are missing. The problem solving process is used incorrectly; steps are missing (see Polya), or incorrectly related to the solution. | No solution is provided. No attempt is made to use symbols, diagrams or appropriate terms. No explanation is supplied. No discernible problem solving strategy is used. |
| AM: art 1 | | | | | |
| AM: art 2 | Content Concepts and Skills | Knowledge of national and state standards as well as content and skills are evidenced in the following ways: An appropriate NCTM Standard , which this problem exemplifies, is selected and a rationale is provided. An appropriate Connecticut Framework Standard , which this problem exemplifies, is selected and a rationale is provided. The identification of (one or more) concepts needed to solve the problem are related to the national and state standards with a correct rationale for each. The identification of (one or more) skills needed to solve the problem are related to the national and state standards with a correct rationale for each. | The standard is appropriate, but could use a better rationale. The standard is appropriate, but could use a better rationale. The concepts are appropriate for the task and the selected standards but could use a better rationale. The skills are appropriate for the task and the selected standards but could use better support. | The selected standard is not an appropriate match and is not well supported by the rationale. The selected standard is not an appropriate match and is not well supported by the rationale. The concepts do not match with the task and the standards and are not well supported. The skills do not match with the task and the standards and are not well supported. | No standard is selected. No standard is selected. No concepts are identified. No skills are identified. |

| Category | Indicator/ Competency | Target Performance Fully Met- 3 (Pass) | Partially Met-2 (Pass) | Not Met-1 (Remediation) | No Response-0 (Remediation) |
|------------------|---------------------------------|--|--|---|---|
| Content Pedagogy | Planning Instructional Strategy | <p>The ability to effectively communicate mathematical content and procedures (instructional strategy) in order to teach the problem/task is presented in the following manner:</p> <p>Appropriate mathematical communication is represented by mathematical and linguistic accuracy (teacher discourse).</p> <p>Dialogue/discourse about “how to approach the task and know what you are looking for” goes beyond what to do to complete the problem. Students are engaged in mathematical discourse (student discourse).</p> <p>Appropriate and effective representations are used to support student learning. Multiple representations are used.</p> <p>Polya’s 4-step problem-solving strategy is explicitly related to the problem/task.</p> <p>Effective essential questions are developed to evaluate student learning (communication). While some questions will be at the knowledge/comprehension level, there is a focus on questions representing “higher order thinking skills.”</p> <p>The process of using reasoning and proof is modeled in the solution to the problem/task.</p> | <p>There are few errors in the mathematical and/or linguistic accuracy.</p> <p>Examples of dialog/discourse are included, but more examples would provide better evidence that students are engaged in understanding the problem/task.</p> <p>The response includes an appropriate representation, but is confined to only one main representation.</p> <p>The problem solving process, used to solve the problem, is only implicit.</p> <p>Not enough questions require higher order thinking. The questions typically call for a one- or two-word answer at the knowledge/comprehension level.</p> <p>The solution to the problem/task requires more justification for students to understand why a specific solution is employed.</p> | <p>There are many errors in the mathematical and/or linguistic accuracy. The reader must reread sentences to comprehend the intent.</p> <p>The dialog/discourse does not provide evidence that students are engaged in understanding the problem/task.</p> <p>One or more of the representations are used incorrectly.</p> <p>The problem solving process is used incorrectly; steps are missing (see Polya), or steps are incorrectly related to the solution.</p> <p>All questions are at the knowledge/comprehension level.</p> <p>The justification of the solution is incorrect or incomplete.</p> | <p>No response is given.</p> <p>No dialog/discourse is provided.</p> <p>No representations are provided.</p> <p>No discernible problem solving strategy is used.</p> <p>No questioning is included in the lesson.</p> <p>No justification of the solution is offered.</p> |

AM:
art 3

| Category | Indicator/ Competency Content | Target Performance Fully Met- 3 (Pass) | Partially Met-2 (Pass) | Not Met-1 (Remediation) | No Response-0 (Remediation) |
|---------------------------------------|--|--|--|--|--|
| Content Pedagogy PAM: Part 3 | Content Knowledge | <p>The ability to incorporate appropriate national and state standards as well as content and skills into an explanation of a mathematical topic is evidenced in the following ways:</p> <p>The pre-specified NCTM standard is incorporated into the response to the problem/task.</p> <p>The pre-specified Connecticut State Department of Education (CSDE) mathematics standard is incorporated into the response to the problem/task.</p> <p>The pre-specified content is incorporated into the response to the problem/task.</p> <p>The pre-specified skills are incorporated into the response to the problem/task.</p> | <p>There are some difficulties in relating the NCTM standard to the problem/task.</p> <p>There are some difficulties in relating the CSDE standard to the problem/task.</p> <p>There are some difficulties in relating the identified content to the problem/task.</p> <p>There are some difficulties in relating the identified skills to the problem/task.</p> | <p>There are significant difficulties relating the NCTM standard to the problem/task.</p> <p>There are significant difficulties relating the CSDE standard to the problem/task.</p> <p>There are significant difficulties relating the identified content to the problem/task.</p> <p>There are significant difficulties relating the identified skills to the problem/task.</p> | <p>There is no response or no discernible connection between the NCTM standard and the problem/task.</p> <p>There is no response or no discernible connection between the CSDE standard and the problem/task.</p> <p>There is no response or no discernible connection between the identified content and the problem/task.</p> <p>There is no response or no discernible connection between the identified skills and the problem/task.</p> |
| Assessment PAM: Part 4 | Analysis of Student Strengths and Weaknesses | <p>Effectively analyze student work in the following ways:</p> <p>Strengths and weaknesses in student responses are accurately identified.</p> <p>In terms of strengths and weaknesses, a complete analysis of the student's response is provided.</p> | <p>At least, 1 strength and 1 weakness are identified, but at least 1 of these is only moderately related to the student's response.</p> <p>At least, 1 strength and 1 weakness are explained, but the analysis of at least one is incomplete.</p> | <p>Either only the strengths or only the weaknesses are identified, or at least 1 is incorrectly identified.</p> <p>The analysis has a weak relation to the student's work.</p> | <p>No strengths and weaknesses are identified.</p> <p>No analysis is given.</p> |

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|------------------------------|---------------------------|--|---|--|--|
| Assessment PAM: Part 4 | Instructional strategy | Based on the student's needs, an instructional strategy is correctly identified and is supported in the following ways: Based on the student's response, an important instructional strategy is identified. (What) A complete description of how to use a remediation strategy is provided and the strategy is directly related to the student's needs. (How) An effective rationale for using the strategy (reasoning and proof) is provided. (Why) | The identified strategy is not an important one in relation to the problem/task and the student's response. The description of how to use the strategy has a few errors or is not completely related to the student's needs. The rationale is only moderately related to the strategy and to the student's needs. | The strategy is poorly related to the problem/task and the student's response. The description of how to use the strategy has many errors and does not adequately address the student's needs. The rationale has a weak relation to the strategy and to the student's needs. | No strategy is identified. The strategy is not described or related to the student's needs. A rationale for using the strategy is not given. |
| Assessment PAM: Part 4 | Feedback | Effectively provide student feedback in the following ways: The explanation is mathematically accurate. The specific feedback should include connections to content and skills represented in the student's work, including inaccuracies, ways to improve, and examples from the student's work. | The mathematical explanation has slight errors. The feedback implies the content and the skills represented in the student's work, but does not mention these directly. | The mathematical explanation has significant errors; the feedback will lead to more errors. The feedback makes weak reference to the content and skills. | No mathematical feedback is provided. No connections are made to the content and skills demonstrated in the student's work. |
| | Related terms | Explicit, complete, fully developed, accurate, correct | Some missing, moderate, slight errors, not enough of, lacks complete explanation, implicit | Many ideas missing, weak, significant errors, incorrect, incomplete, consistently poor, inaccurate | Information not provided, no discernable connection |