

Exemplars[®] Classic 5-Level Math Rubric*

	Problem Solving	Reasoning and Proof	Communication	Connections	Representation
Novice	<p>No strategy is chosen, or a strategy is chosen that will not lead to a solution.</p> <p>Little or no evidence of engagement in the task present.</p>	<p>Arguments are made with no mathematical basis.</p> <p>No correct reasoning nor justification for reasoning is present.</p>	<p>No awareness of audience or purpose is communicated.</p> <p style="text-align: center;">or</p> <p>Little or no communication of an approach is evident</p> <p style="text-align: center;">or</p> <p>Everyday, familiar language is used to communicate ideas.</p>	<p>No connections are made.</p>	<p>No attempt is made to construct a mathematical representation.</p>
Apprentice	<p>A partially correct strategy is chosen, or a correct strategy for only solving part of the task is chosen.</p> <p>Evidence of drawing on some previous knowledge is present, showing some relevant engagement in the task.</p>	<p>Arguments are made with some mathematical basis.</p> <p>Some correct reasoning or justification for reasoning is present with trial and error, or unsystematic trying of several cases.</p>	<p>Some awareness of audience or purpose is communicated, and may take place in the form of paraphrasing of the task.</p> <p style="text-align: center;">or</p> <p>Some communication of an approach is evident through verbal/written accounts and explanations, use of diagrams or objects, writing, and using mathematical symbols.</p> <p style="text-align: center;">or</p> <p>Some formal math language is used, and examples are provided to communicate ideas.</p> <p><i>NOTE: The following are not assessed:</i></p> <ul style="list-style-type: none"> • Numbers and their names (i.e., 5, five, etc.) • Verbs (i.e., counted, divided, etc.) • Generic symbols (+, -, ×, ÷, =) 	<p>Some attempt to relate the task to other subjects or to own interests and experiences is made.</p>	<p>An attempt is made to construct a mathematical representation to record and communicate problem solving.</p>

*Based on revised NCTM standards.

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	Problem Solving	Reasoning and Proof	Communication	Connections	Representation
Practitioner	<p>A correct strategy is chosen based on mathematical situation in the task.</p> <p>Planning or monitoring of strategy is evident.</p> <p>Evidence of solidifying prior knowledge and applying it to the problem solving situation is present.</p> <p><i>Note: The Practitioner must achieve a correct answer.</i></p>	<p>Arguments are constructed with adequate mathematical basis.</p> <p>A systematic approach and/or justification of correct reasoning is present. This will lead to connections.</p>	<p>A sense of audience or purpose is communicated.</p> <p style="text-align: center;">and/or</p> <p>Communication of an approach is evident through a methodical, organized, coherent sequenced and labeled response.</p> <p>Formal math language is used throughout the solution to share and clarify ideas.</p> <p><i>NOTE: The following are not assessed:</i></p> <ul style="list-style-type: none"> • Numbers and their names (i.e., 5, five, etc.) • Verbs (i.e., counted, divided, etc.) • Generic symbols (+, -, ×, ÷, =) 	<p>Mathematical connections or observations are recognized. Some examples may include, but are not limited to:</p> <ul style="list-style-type: none"> • clarification of the task. • exploration of mathematical phenomenon. • noting patterns, structures and regularities. 	<p>An appropriate and accurate mathematical representation(s) is constructed and refined to solve problems or portray solutions.</p>
Expert	<p>An efficient strategy is chosen and progress towards a solution is evaluated.</p> <p>Adjustments in strategy, if necessary, are made along the way, and/or alternative strategies are considered.</p> <p>Evidence of analyzing the situation in mathematical terms, and extending prior knowledge is present.</p> <p><i>Note: The Expert must achieve a correct answer.</i></p>	<p>Deductive arguments are used to justify decisions and may result in formal proofs.</p> <p>Evidence is used to justify and support decisions made and conclusions reached. This will lead to connections.</p>	<p>A sense of audience and purpose is communicated.</p> <p style="text-align: center;">and/or</p> <p>Communication at the Practitioner level is achieved, and communication of argument is supported by mathematical properties.</p> <p>Precise math language and symbolic notation are used to consolidate math thinking and to communicate ideas.</p> <p><i>NOTE: The following are not assessed:</i></p> <ul style="list-style-type: none"> • Numbers and their names (i.e., 5, five, etc.) • Verbs (i.e., counted, divided, etc.) • Generic symbols (+, -, ×, ÷, =) 	<p>Mathematical connections or observations are used to extend the solution to other mathematics or to a deeper understanding of mathematics. Some examples may include, but are not limited to:</p> <ul style="list-style-type: none"> • testing and accepting or rejecting of a hypothesis or conjecture. • explanation of phenomenon. • generalizing and extending the solution to other cases. 	<p>An abstract or symbolic mathematical representation(s) is constructed to analyze relationships, and to clarify or interpret phenomenon.</p>

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