

Mathematics Problem Solving Scoring Guide  
Northwest Regional Educational Laboratory

	<b>Emerging (0-1)</b>	<b>Developing (2-3)</b>	<b>Proficient (4-5)</b>	<b>Exemplary (6-7)</b>
<p><b>Conceptual Understanding</b></p> <p>Key Question: <i>Does the student's interpretation of the problem using mathematical representations and procedures accurately reflect the important mathematics in the problem?</i></p>	<ol style="list-style-type: none"> <li>1. Your mathematical representations of the problem were incorrect.</li> <li>2. You used the wrong information in trying to solve the problem.</li> <li>3. The mathematical procedures you used would not lead to a correct solution.</li> <li>4. You used mathematical terminology incorrectly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Your choice of forms to represent the problem was inefficient or inaccurate.</li> <li>2. You used some but not all of the relevant information from the problem.</li> <li>3. The mathematical procedures you used would lead to a partially correct solution.</li> <li>4. You used mathematical terminology imprecisely.</li> </ol>	<ol style="list-style-type: none"> <li>1. Your choices of mathematical representations of the problem were appropriate.</li> <li>2. You used all relevant information from the problem in your solution.</li> <li>3. The mathematical procedures you chose would lead to a correct solution.</li> <li>4. You used mathematical terminology correctly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Your choice of mathematical representations helped clarify the problem's meaning.</li> <li>2. You uncovered hidden or implied information not readily apparent.</li> <li>3. You chose mathematical procedures that would lead to an elegant solution.</li> <li>4. You used mathematical terminology precisely.</li> </ol>

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<p><b>Strategies and Reasoning</b></p> <p>Key Question: <i>Is there evidence that the student proceeded from a plan, applied appropriate strategies, and followed a logical and verifiable process toward a solution?</i></p>	<ol style="list-style-type: none"> <li>1. Your strategies were not appropriate for the problem.</li> <li>2. You didn't seem to know where to begin.</li> <li>3. Your reasoning did not support your work.</li> <li>4. There was no apparent relationship between your representations and the task.</li> <li>5. There was no apparent logic to your solution.</li> <li>6. Your approach to the problem would not lead to a correct solution.</li> </ol>	<ol style="list-style-type: none"> <li>1. You used an oversimplified approach to the problem.</li> <li>2. You offered little or no explanation of your strategies.</li> <li>3. Some of your representations accurately depicted aspects of the problem.</li> <li>4. You sometimes made leaps in your logic that were hard to follow.</li> <li>5. Your process led to a partially complete solution.</li> </ol>	<ol style="list-style-type: none"> <li>1. You chose appropriate, efficient strategies for solving the problem.</li> <li>2. You justified each step of your work.</li> <li>3. Your representation(s) fit the task.</li> <li>4. The logic of your solution was apparent.</li> <li>5. Your process would lead to a complete, correct solution of the problem.</li> </ol>	<ol style="list-style-type: none"> <li>1. You chose innovative and insightful strategies for solving the problem.</li> <li>2. You proved that your solution was correct and that your approach was valid.</li> <li>3. You provided examples and/or counterexamples to support your solution.</li> <li>4. You used a sophisticated approach to solve the problem.</li> </ol>
<p><b>Computation &amp; Execution</b></p> <p>Key Question: <i>Given the approach taken by the student, is the solution performed in an accurate and complete manner?</i></p>	<ol style="list-style-type: none"> <li>1. Errors in computation were serious enough to flaw your solution.</li> <li>2. Your mathematical representations were inaccurate.</li> <li>3. You labeled incorrectly.</li> <li>4. Your solution was incorrect.</li> <li>5. You gave no evidence of how you arrived at your answer.</li> </ol>	<ol style="list-style-type: none"> <li>1. You made minor computational errors.</li> <li>2. Your representations were essentially correct but not accurately or completely labeled.</li> <li>3. Your inefficient choice of procedures impeded your success.</li> <li>4. The evidence for your solution was inconsistent or unclear.</li> </ol>	<ol style="list-style-type: none"> <li>1. Your computations were essentially accurate.</li> <li>2. All visual representations were complete and accurate.</li> <li>3. Your solution was essentially correct.</li> <li>4. Your work clearly supported your solution.</li> </ol>	<ol style="list-style-type: none"> <li>1. All aspects of your solution were completely accurate.</li> <li>2. You used multiple representations for verifying your solution.</li> <li>3. You showed multiple ways to compute your answer.</li> </ol>

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<p><b>Communication</b></p> <p>Key Question: <i>Was I able to easily understand the student's thinking or did I have to make inferences and guesses about what they were trying to do?</i></p>	<ol style="list-style-type: none"> <li>1. I couldn't follow your thinking.</li> <li>2. Your explanation seemed to ramble.</li> <li>3. You gave no explanation for your work.</li> <li>4. You did not seem to have a sense of what your audience needed to know.</li> <li>5. Your mathematical representations did not help clarify your thinking.</li> </ol>	<ol style="list-style-type: none"> <li>1. Your solution was hard to follow in places.</li> <li>2. I had to make inferences about what you meant in places.</li> <li>3. You weren't able to sustain your good beginning.</li> <li>4. Your explanation was redundant in places.</li> <li>5. Your mathematical representations were somewhat helpful in clarifying your thinking.</li> </ol>	<ol style="list-style-type: none"> <li>1. I understood what you did and why you did it.</li> <li>2. Your solution was well organized and easy to follow.</li> <li>3. Your solution flowed logically from one step to the next.</li> <li>4. You used an effective format for communicating.</li> <li>5. Your mathematical representations helped clarify your solution.</li> </ol>	<ol style="list-style-type: none"> <li>1. Your explanation was clear and concise.</li> <li>2. You communicated concepts with precision.</li> <li>3. Your mathematical representations expanded on your solution.</li> <li>4. You gave an in-depth explanation of your reasoning.</li> </ol>
<p><b>Insights</b></p> <p>Key Question: <i>Does the student grasp the deeper structure of the problem and see how the process used to solve this problem connects it to other problems or "real-world" applications?</i></p>	<ol style="list-style-type: none"> <li>1. You were unable to recognize patterns and relationships.</li> <li>2. You found a solution and then stopped.</li> <li>3. You found no connections to other disciplines or mathematical concepts</li> </ol>	<ol style="list-style-type: none"> <li>1. You recognized some patterns and relationships.</li> <li>2. You found multiple solutions but not all were correct.</li> <li>3. Your solution hinted at a connection to an application or another area of mathematics.</li> </ol>	<ol style="list-style-type: none"> <li>1. You recognized important patterns and relationships in the problem.</li> <li>2. You found multiple solutions using different interpretations of the problem.</li> <li>3. You connected your solution process to other problems, areas of mathematics or applications.</li> </ol>	<ol style="list-style-type: none"> <li>1. You created a general rule or formula for solving related problems.</li> <li>2. You related the underlying structure of the problem to other similar problems.</li> <li>3. You noted possible sources of error or ambiguity in the problem.</li> <li>4. Your connection to a real-life application was accurate and realistic.</li> </ol>