

**VERMONT HIGH SCHOOL**

**MATHEMATICS**

**PORTFOLIO SCORING GUIDE**

**Revised**  
**September 2001**

**This scoring guide was developed by the Vermont Department of Education in collaboration with the Vermont Institute of Science, Math and Technology.**

## PROBLEM SOLVING

<p><b>PS1: Approach &amp; Reasoning<sup>1</sup></b> <i>The strategies and skills used to solve the problem and the reasoning that supports the approach</i></p>	<p><b>Level 1</b></p> <p>The approach and reasoning are not apparent, or wouldn't work.</p>	<p><b>Level 2</b></p> <p>The approach and reasoning would lead to solving only part of the problem,<sup>2</sup> or reaching a partial solution<sup>3</sup>.</p>	<p><b>Level 3</b></p> <p>The approach and reasoning worked, or would work<sup>4</sup> for the problem.</p>	<p><b>Level 4</b></p> <p>The approach and reasoning worked and additional aspects of good problem solving are evident, such as:</p> <ul style="list-style-type: none"> <li>• use of 2 or more distinct approaches for solving the problem;</li> <li>• testing, and accepting or rejecting approaches;</li> <li>• identification and use of a(n) additional factor(s) that affect the approach used to solve the problem.</li> </ul>
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<sup>1</sup>Reasoning may be seen in the logical sequence of the solution, explanation for decisions, evidence of inductive or deductive reasoning, etc. Flawed reasoning may not score above a level 2.

<sup>2</sup>Part of the problem: for multi-part problems an approach must be present for all parts.

<sup>3</sup>Partial solution: approach(s) would work BUT some aspect(s) of the problem, needed for completion, are not addressed.

<sup>4</sup>Would work: approach(s) that would work for a problem, even if not accurately executed.

<p><b>PS2: EXECUTION of the TASK</b> <i>The mathematical work that supports the student's solution<sup>1</sup> to the problem.</i></p>	<p><b>Level 1</b></p> <p>Little or no execution is present, or execution is wrong, or execution is present but doesn't support the solution given.</p>	<p><b>Level 2</b></p> <p>Execution is present for only part of the problem, or is partially correct and/or complete which may lead to an incomplete or incorrect solution.</p>	<p><b>Level 3</b></p> <p>Execution for all parts of the problem is present <u>and</u> supports the correct solution.</p>
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<sup>1</sup>Solution: the answer(s) to the question(s) in the task.

Rule: If the student solves a different problem from the original problem, s/he scores a level 1 on this criterion unless the solution is based upon additional factors identified correctly in PS1.

<p><b>PS3: BEYOND the TASK</b> <i>Observations<sup>1</sup> Connections<sup>2</sup> Extensions<sup>3</sup></i></p>	<p><b>Level 1</b></p> <p>Response stops without including an observation, connection or extension.</p>	<p><b>Level 2</b></p> <p>Response includes an observation, connection, or extension, but does not fully demonstrate understanding.</p>	<p><b>Level 3</b></p> <p>Response includes <u>and</u> demonstrates an understanding<sup>4</sup> of a connection or extension.</p>
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<sup>1</sup>Observations are statements indicating the recognition of mathematical ideas.

<sup>2</sup>Connections are statements indicating links between and among mathematical ideas, applications, and/or similar problems.

<sup>3</sup>Extensions are statements demonstrating the use of mathematical ideas from the given task to solve a similar but more complicated problem.

<sup>4</sup>Demonstrates an Understanding: There must be evidence in the work that shows that the student has a full understanding of the connection or extension.

Rules:

- Finding a general rule, which is not specifically requested, is considered an extension.
- When a general rule is requested as part of the task, it is scored in PS1 and PS2, and is NOT considered as an extension in this criterion.

## COMMUNICATION

<p><b>C1: MATHEMATICAL LANGUAGE AND/OR REPRESENTATION</b>  <i>The use of accurate<sup>1</sup> and appropriate<sup>2</sup> mathematical language and/or representation<sup>3</sup></i></p>	<p><b>Level 1</b></p>	<p><b>Level 2</b></p>	<p><b>Level 3</b></p>	<p><b>Level 4</b></p>
	<p>Mathematical language and/or representation is consistently inaccurate,  or  inappropriate,  or  absent.</p>	<p>Mathematical language and/or representation is appropriate but contains flaws in accuracy.</p>	<p>Mathematical language and/or representation is appropriate and accurate.</p>	<p>Mathematical language and/or representation is appropriate and accurate,  and  uses symbolic notation,  and  uses two or more distinctly different representations with a clear linkage between the representations and the text.</p>
<p><sup>1</sup>Accurate implies:</p> <ul style="list-style-type: none"> <li>• The correct use of vocabulary and symbols</li> <li>• Diagrams, graphs, models, and tables are correctly labeled and scaled when appropriate</li> <li>• Units of measure are consistently present and appropriate</li> </ul> <p><sup>2</sup>Appropriate: makes sense for the problem</p> <p><sup>3</sup>Representations: Include algebraic equations and expressions, diagrams, formulas, graphs, models, symbolic notations, tables, or other mathematical notations.</p> <p>Rules:</p> <ul style="list-style-type: none"> <li>• A student does not get credit for completing a representation that is included in or called for in the task.</li> <li>• A few minor flaws in accuracy of vocabulary and/or representations, in a response rich in the use of vocabulary and representations does not lower the score to a level 2 unless the mistakes are significant in the context of the problem.</li> </ul>				
<p><b>C2: OVERALL PRESENTATION</b>  <i>Documentation of how the problem was solved and the reasoning used</i></p>	<p><b>Level 1</b></p>	<p><b>Level 2</b></p>	<p><b>Level 3</b></p>	
	<p>The presentation of the solution contains major gaps,  or  little or no evidence of how the problem was solved or the reasoning used.</p>	<p>The presentation of the solution contains minor gaps in how the problem was solved or the reasoning used.</p>	<p>The presentation of the solution clearly shows how the problem was solved and the reasoning used,  and  is logical and organized.</p>	
<p>Rule: The problem does not need to be solved correctly to score a Level 2 or a Level 3 in this criterion.</p>				