

Task Specific Rubric

Skip the Movie?

Grade 4

A Few Notes about Rubrics, Benchmark Papers and Scoring...

- Proficiency levels are determined by the content and performance standards, teachers should always compare the student's performance to the standards to assess proficiency levels.
- It is helpful for teachers to discuss the proficiency levels before scoring student work.
- The benchmark papers and task specific rubric are designed to help the teacher analyze student thinking and understanding at each of the four performance levels: Novice, Apprentice, Proficient/Practitioner, and Expert (NAPE).
- It is recommended that teachers use the task specific rubric given for the assessment to identify the specific math skills that make up each section of the four performance levels for the task.
- Teachers should also review the benchmark papers provided to get a sense of the mathematics that students will use to solve the task.
- Teachers should scan their students' papers to get a sense of the mathematical thinking their students are using to solve the task before they begin scoring student work.
- The benchmark papers and task specific rubric are generalizations of what student work could look like.
It is not possible to anticipate every answer a student can give, so in scoring student work the teacher must use these generalizations to come to their own conclusions as to where a student is performing on the assessment.
- Teachers should use the three analytic criteria of Understanding, Strategies and Communication to determine a student's holistic performance on a task. The holistic score reflects the overall student's performance on the task and indicates the student's understanding of the mathematical concepts being assessed in the task.
-



Rubric: Skip the Movie?

APS Target APS Mathematics Performance Standards

Strand I: Global Mathematical Processes:

- Communicates mathematical thinking coherently and clearly to others.

Strand V: Patterns, Functions and Algebraic Concepts – Grade 4

- Identifies and extends a growing pattern with symbols, patterns, and numbers; and writes a numerical description
- Organizes information in T-charts and describes patterns numerically.

Level	Understanding	Strategies, Reasoning, & Procedures	Communication
Unscorable	✓ The student demonstrates no understanding of the mathematics in the problem.	✓ The student does not attempt to implement a strategy or procedure for solving the problem. ✓ The student makes random attempts to solve the task that clearly do not relate to the task.	✓ The student does not attempt to use mathematical representations, language or symbols to communicate a solution to the problem.

Level	Understanding	Strategies, Reasoning, & Procedures	Communication																						
Novice	<p>The student understands that:</p> <ul style="list-style-type: none"> The task is a multi-step problem, but does not have the mathematical knowledge to complete the task; and will only attempt to solve one or two aspects of the problem. 	<ul style="list-style-type: none"> ✓ The student does not use an effective strategy to solve the problem. ✓ The student has no system to track the calculations in movie attendance. 	<ul style="list-style-type: none"> ✓ There is little communication of the procedures used. ✓ The student does not solve the problem and cannot state his/her final answer. ✓ The student uses little or no mathematical language or symbols. 																						
Apprentice	<p>The student understands that:</p> <ul style="list-style-type: none"> The task is a multiple step problem, but cannot use the information at each of the steps to solve the problem. S/he must identify the pattern of movie attendance, but they cannot correctly find the tenth day's attendance. <p>The student does not understand that:</p> <ul style="list-style-type: none"> The attendance calculations are needed to make a decision about whether or not s/he should attend the movie. 	<ul style="list-style-type: none"> ✓ The student has started the task but is unable to achieve a correct solution. ✓ The student may not know how to address all of the aspects of the task or may answer with an incorrect answer. <ul style="list-style-type: none"> The student creates an accurate chart to track the attendance but does not use the information to solve the problem. The student may not apply the (-8) pattern correctly to complete an accurate chart. <p>Sample Strategies:</p> <ul style="list-style-type: none"> ✓ The student shows the decreasing attendance using a t-chart, but makes calculation errors. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Show</th> <th>People</th> </tr> </thead> <tbody> <tr><td>1</td><td>80</td></tr> <tr><td>2</td><td>72</td></tr> <tr><td>3</td><td>64</td></tr> <tr><td>4</td><td>56</td></tr> <tr><td>5</td><td>48</td></tr> <tr><td>6</td><td>40</td></tr> <tr><td>7</td><td>33</td></tr> <tr><td>8</td><td>26</td></tr> <tr><td>9</td><td>18</td></tr> <tr><td>10</td><td>10</td></tr> </tbody> </table>	Show	People	1	80	2	72	3	64	4	56	5	48	6	40	7	33	8	26	9	18	10	10	<ul style="list-style-type: none"> ✓ The student explains his/her reasoning and used some basic mathematical language without being clearly organized. ✓ The student attempts to represent (i.e. chart) the movie attendance ✓ The student does not state his/her final answer, states an incorrect answer, and /or does not explain why or why not s/he should attend the movie.
Show	People																								
1	80																								
2	72																								
3	64																								
4	56																								
5	48																								
6	40																								
7	33																								
8	26																								
9	18																								
10	10																								

Level	Understanding	Strategies, Reasoning, & Procedures	Communication																						
Practitioner/Proficient	<p>The student understands that:</p> <ul style="list-style-type: none"> • The task is a multiple step problem, and the answer at each step leads to a final solution. • S/he needs to identify the pattern and organize the attendance data for the movie. • S/he needs to determine the number of people who will attend the tenth show. • S/he must use the data collected to explain why they would or would not attend the movie. 	<ul style="list-style-type: none"> ✓ The student uses one accurate and appropriate strategy to correctly solve all the steps of the task. ✓ The student must use an organizational system (i.e., chart or table) to record the attendance data. <p>Task calculations include:</p> <ul style="list-style-type: none"> • Organizing the attendance data. • Identify one of the many 8 patterns (i.e. minus 8, multiples of 8, decrease by 8, etc.) • Identifying the decreasing attendance and determining the 10th show attendance. • Explains mathematically why s/he should or should not see the movie. <p>Sample Strategies:</p> <ul style="list-style-type: none"> ✓ The student states the pattern: Subtract by 8 ✓ Uses a t-table/chart to organize data. ✓ Supports their answer: I would not attend the show because less and less people are attending the shows. By the 10th show only 8 people will be in the theater. The show must not be very good. <table border="1" data-bbox="1157 800 1421 1149" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Show</th> <th>People</th> </tr> </thead> <tbody> <tr><td>1</td><td>80</td></tr> <tr><td>2</td><td>72</td></tr> <tr><td>3</td><td>64</td></tr> <tr><td>4</td><td>56</td></tr> <tr><td>5</td><td>48</td></tr> <tr><td>6</td><td>40</td></tr> <tr><td>7</td><td>32</td></tr> <tr><td>8</td><td>24</td></tr> <tr><td>9</td><td>16</td></tr> <tr><td>10</td><td>8</td></tr> </tbody> </table>	Show	People	1	80	2	72	3	64	4	56	5	48	6	40	7	32	8	24	9	16	10	8	<ul style="list-style-type: none"> ✓ The explanations are concise and clear as to how the student organized the problem and solutions. ✓ The student uses proper mathematical language and symbols to explain his/her answers. ✓ The student organizes the data and clearly states the number of people attending the tenth show. ✓ The student uses the attendance data to support why he should or should not see the movie.
Show	People																								
1	80																								
2	72																								
3	64																								
4	56																								
5	48																								
6	40																								
7	32																								
8	24																								
9	16																								
10	8																								

Level	Understanding	Strategies, Reasoning, & Procedures	Communication
Expert	<p>The student’s understanding will demonstrate all of the ‘proficient’ criteria.</p> <p>The student understands that:</p> <ul style="list-style-type: none"> • The task is a multiple step problem, and the answer at each step leads to a final solution. • S/he needs to identify the pattern and organize the attendance data for the movie. • S/he needs to determine the number of people who will attend the tenth show. • S/he must use the data collected to explain why they would or would not attend the movie. <p><u>Task Extension:</u> The expert in some way will demonstrate an exemplary understanding of the task and the mathematical concepts.</p> <p>Here are some examples of an expert extension:</p> <ul style="list-style-type: none"> • Equations with variables. • A graph to display information. • Recognizing additional patterns within the initial pattern. 	<p>The student’s solution will demonstrate all of the ‘proficient’ criteria.</p> <ul style="list-style-type: none"> • The student uses more than one accurate and appropriate strategy to correctly solve all of the steps in the task. • Task calculations include: <ul style="list-style-type: none"> ✓ Organizing the attendance data. ✓ Identify one of the many 8 patterns (i.e. minus 8, multiples of 8, decrease by 8, etc.) ✓ Identifying the decreasing attendance and determining the 10th show attendance. ✓ Explains mathematically why s/he should or should not see the movie. <p><u>Task Extension:</u> The expert in some way will demonstrate an exemplary strategy of the task and the mathematical concepts.</p> <p>Here are some examples of an expert extension:</p> <ul style="list-style-type: none"> • Creating a graph to show the declining movie attendance. • Demonstrating knowledge of the reverse pattern of declining attendance and the amount of attendance drop from the first show; this shows a flexibility in decomposing and recombining the number 80 ($72 + 8 = 80$; $64 + 16 = 80$; $56 + 24 = 80$; etc) • Writing an equation showing a formula for determining the daily attendance. $88 - 8x = \text{attendance}$ $x = \text{show number}$ 	<p>The student’s communication will demonstrate all of the ‘proficient’ criteria.</p> <ul style="list-style-type: none"> • The student can represent and communicate his/her work in a clear organized manner. • The student uses proper mathematical language and symbols to explain his/her answers. • The student clearly states the number of people attending the tenth show. • The student uses the information in the chart to support why his friend should or should not see the movie. <p><u>Task Extension:</u> The expert in some way will demonstrate an exemplary strategy of the task and the mathematical concepts.</p> <p>Here is an example of an expert extension:</p> <ul style="list-style-type: none"> • Including a written rule, equation, generalization, and/or observation about his/her mathematical insights for identifying and extending patterns.