

Transcript for MSDE-MCAP Holistic Rubric for Modeling Items

Recorded by: Esin Caglayan-Guner, Mathematics Assessment Specialist

Welcome to our MCAP mathematics assessment webinar on Holistic Rubrics. My name is Esin Caglayan-Guner. I am the math assessment specialist at Maryland State Department of Education. Our webinar today will focus on the MCAP Holistic Rubrics for modeling items. There is another webinar that focuses on the holistic rubric for reasoning items.

Today, I would like to talk about the MCAP Holistic Rubrics for modeling items. The outcomes of this presentation are the following: Review the MCAP holistic rubrics for modeling items, understand the difference between the MCAP holistic rubric and the PARCC rubric, score the responses of modeling items by using the MCAP holistic rubric and compare scoring student responses using the PARCC rubric and MCAP holistic rubric. In MCAP math assessments, we have 1-point, 3-point and 4-point modeling items. 1-point items are machine scored items. 3 and 4-point reasoning items are human scored items. We use 3 and 4-point holistic rubrics for human scored constructed response items. In this webinar, I will show you examples of PARCC released items and how these items are scored using the PARCC rubric and the MCAP holistic rubric.

Our constructed response items will be scored based on a holistic rubric. So, how are the MCAP holistic rubrics different than the PARCC rubrics? The student scores were based on the inclusion of the elements listed in the PARCC rubric, it is an element specific rubric. Holistic rubric is a better way of assessing student without using the step by step elements of the rubric. Holistic rubric looks at the student response as a whole. Therefore, we feel that holistic rubrics are appropriate for summative assessments because they provide an overall evaluation of a student's product or performance. Holistic rubric allows for more flexibility in scoring student work who use math to answer constructed response items in different ways and with different methods. A holistic rubric uses a single scale that includes all of the criteria that are going to be considered together in the evaluation. So, the result is a single score assigned based on an overall evaluation of the student's work. Our holistic rubric uses a scale of 0 to 3 for 3-point items and 0 to 4 for 4-point modeling items, with the lowest level of proficiency of zero.

This is the 3-point holistic rubric for modeling items. A three-point response for modeling items provides full and complete evidence of the modeling process used to solve a real-world problem. A two-point response for modeling items provides partial evidence of the modeling process used to solve a real-world problem. A one-point response provides limited evidence of the mathematical process used to solve a real-world problem. A zero-point response is completely incorrect, incoherent and/or irrelevant.

This is the holistic rubric for 4-point modeling items. The scale is similar to the 3-point holistic rubric. A four-point response for modeling items provides full and complete evidence of the modeling process used to solve a real-world problem. A three-point response provides slightly flawed evidence of the modeling process used to solve a real-world problem. A two-point response for modeling items provides partial evidence of the modeling process used to solve a real-world problem. A one-point response provides limited evidence of the modeling process used to solve a real-world problem. A zero-point response is completely incorrect, incoherent and/or irrelevant. You can find these rubrics on our website under MCAP resources.

Let's take a look at some examples. This is a 3-point Grade 3 PARCC item.

Jennifer is going to the fair with 8 of her friends. She had 36 tickets left over from her last visit and buys 27 more tickets during this visit. She wants to give the same amount of tickets to each of her friends and herself. How many tickets did Jennifer and her friends each receive? Show your work. Enter your answer and your work in the space provided. You will see the PARCC rubric in the next slide.

This is the PARCC rubric for the item. In the next slide, you will see the question and the rubric side by side. For a score of 3, student response includes the following three elements: Modeling component 2 points. Valid work shown for the total number of tickets. Valid work shown for the number of tickets each friend received. Computation component 1 point. Correct number of tickets each friend received, 7. Sample student response: Jennifer and each of her friends got 7 tickets. $36 + 27 = 63$, $63 \div 9 = 7$. Or other correct response. For a score of 2, student response includes two of the three elements. For a score of 1, student response includes one of the three elements. For a score of 0, student response is incorrect or irrelevant.

As you see, the rubric includes three elements: first two are labeled as modeling component, and the last one is labeled as computation component. A score of 3 is given to student response, if it has all three elements. A score of 2 is given to student response, if it has two elements, and so on. If the response is incorrect or irrelevant, then it gets no credit.

Unlike the PARCC rubric, our holistic rubric has some flexibility in scoring student responses. If students miss a minor step, they are still awarded full credit. Now, you will see some student responses and understand how they are scored using the PARCC and MCAP holistic rubrics. These examples will give you some ideas about our holistic rubrics. All constructed response items will be scored by a committee of Maryland educators, and the committee will have discussions to determine the scores of students' responses.

By the PARCC rubric, this response receives full credit, which is three points. The student includes each of the three required elements. The correct answer is indicated as 7 tickets. The correct addition is shown as $36 + 27 = 63$. The correct division is shown as $63 \div 9 = 7$. Review the criteria for a '3' on the MCAP rubric. Do you think this response receives 3 points?

What does the student show in the work that supports a score of 3? The model for number of tickets is correct and clear $36 \text{ plus } 27$. The model for division by correct total number of students is clear. This response demonstrates full and complete modeling process. It identifies the problem and determines information needed to solve. It also communicates an organized and accurate solution path with precise representations. Therefore, this response would most likely get 3 points using the MCAP rubric.

This response receives partial credit. The student includes two of the three required elements. The correct answer is indicated. Each friend would get 7. The correct addition is shown as $36 \text{ plus } 27 \text{ equals } 63$. The division work is not shown. What does this response demonstrate based on the MCAP holistic rubric's criteria? Does this show a 'score of 2' or perhaps a '1'? According to the MCAP rubric, this response shows limited or partial evidence of the modeling process, it contains the correct solution but work is limited and/or missing. Is this "an unorganized solution path" and an "error in identifying much of the mathematics needed to solve the problem?" or is this "an incomplete solution path" with "some errors in identifying the mathematics needed to solve the problem"? Take a few minutes and think about it.

This response gets partial credit, Score Point 1 using the PARCC rubric. The student includes one of the three required elements. The correct addition is shown. And an incorrect final answer is shown. A division equation is shown that incorrectly uses the number of friends for the divisor instead of the number of friends plus Jennifer and therefore it does not receive credit. According to the MCAP rubric, would you give this response 2 points or 1 point? There is some correct work, not all the work is correct. So, there is partial evidence of the modeling process. This response is not so much an incomplete or unorganized solution path, so it fits more as a 2 with an error than with a 1. Note also that the student forgot about Jennifer and may have misread the problem.

Here is another student response. This response gets Score Point 0 using the PARCC rubric. It receives no credit. The student includes none of the three required elements. An incorrect final answer is shown. No addition work is shown. Instead of the correct work, a subtraction problem is incorrectly shown. No division work is shown. Similarly, this response would get 0 using the MCAP holistic rubric. Because subtraction is the incorrect model to find the number of tickets per friend, the response is completely incorrect. Note that if the subtraction had resulted in an answer of 7 tickets per friend which is the right number, the score would still be a zero.

Another example. This response gets Score Point 0 using the PARCC rubric. The student includes none of the three required elements. 9 is the incorrect answer. No addition work is shown for the 63. A division equation is shown that incorrectly uses the number of friends for the divisor instead of the number of friends plus Jennifer and therefore does not receive credit. Unlike the PARCC rubric, this response gets 1 point when using the MCAP holistic rubric.

Dividing the number of tickets by 8, which the response explains as 'her friends and herself' is correct, but the number 8 is just the total number of friends, not including Jennifer. This inconsistency between the numbers and the words presents what our rubric would call an "unorganized solution path" and therefore the response earns only 1 score point.

Whereas PARCC considered this an incorrect division step, MCAP would consider it an "error in identifying the mathematics that is needed to solve the problem." But in this response, because the addition is not shown, the response overall holistically is "limited" more than it is "partial."

This is another PARCC item. It is an example of a 3-point Grade 8 item.

A 10-ounce box of cereal costs three dollars. A 20-ounce box of the same cereal costs five dollars. A third box of the same cereal costs eight dollars. Use the given relationships to write a linear equation that expresses the price of a box of cereal as a function of the number of ounces of cereal in the box. Calculate the number of ounces in the third box of cereal. Show your work or explain your answer. Enter your equation, your answer, and your work in the space provided. You will see the PARCC rubric in the next slide.

Here is the PARCC rubric for the Grade 8 item. In the next slide, you will see the question and the rubric side by side. For a score of 3, student response includes the following three elements. Computation component 1 point. Correct number of ounces in the third box, 35. Modeling component 1 point. Correct equation that represents the price, p , of a box of cereal as a function of the number of ounces, x , in the box; $p = (1/5)x + 1$ or equivalent. Modeling component 1 point. Valid work shown or explanation given. For a score of 2, student response includes two of the three elements. For a score of 1, student response includes one of the three elements. For a score of 0, student response is incorrect or irrelevant.

As you see, the rubric includes three elements, first component is computation, and the last two are modeling. A score of 3 is given to the student response, if it has all three elements. A score of 2 is given to the student response, if it has two elements, and so on. If the response is incorrect or irrelevant, then it gets no credit. Unlike the PARCC rubric, our holistic rubric has some flexibility in scoring student responses. If students miss a minor step, they are still awarded full credit. Now, you will see some student responses and understand how they are scored using two different rubrics.

Here is our first example. This response receives full credit according to the PARCC rubric. It includes each of the three required elements. A correct equation that represents the price of a box of cereal as a function of the number of ounces in a box is provided. The correct calculation of the number of ounces in the third box is provided as 35 ounces. Valid work shown or explanation given is provided. Similarly, this response gets 3 points using the MCAP rubric. Because the response identifies the problem that needs to be solved and determines information that is needed to solve the problem and communicates an accurate, organized solution path using appropriate representations.

This response receives partial credit. It includes two of the three required elements, and receives 2 points using the PARCC rubric. A correct equation that represents the price of a box of cereal as a function of the number of ounces in a box is provided. The correct calculation of the number of ounces in the third box is provided as 35 ounces. Valid work shown or explanation given is missing. Let's score this response using the MCAP holistic rubric. What does this response demonstrate based on the MCAP holistic rubric's criteria? According to the MCAP rubric, this response shows partial evidence of the modeling process, it contains the correct solution but work is missing.

Here is another student response. This response receives partial credit. It includes one of the three required elements, so it gets 1 point using the PARCC rubric. The correct calculation of the number of ounces in the third box is provided. A correct equation that represents the price of a box of cereal as a function of the number of ounces in a box is missing. Valid work shown or explanation given is insufficient. More information is required for the element to receive credit. What does this response demonstrate based on the MCAP holistic rubric's criteria? Does this response provide partial or limited evidence of the modeling process? Would you score this response as 1 or 2 points? Take a few minutes and think about it.

Here is our last example. This response receives no credit. It includes none of the three required elements based on the PARCC rubric. An incorrect equation that represents the price of a box of cereal as a function of the number of ounces in a box is provided. Providing the slope-intercept form of an equation will not receive credit. A correct calculation of the number of ounces in the third box is missing. Work shown or explanation given is incorrect. Let's score this response using the MCAP holistic rubric. Obviously, there is no answer to the questions asked. There is no evidence of the solution path and the information provided is incorrect. The student provides the general form of the equation as $y = mx + b$ and the other equations are incorrect. Does this response demonstrate a score of a '0' or a '1'?

Thank you for watching this webinar. I hope you have a deeper understanding of the MCAP holistic rubric for modeling items. Please email us if you have any questions. Have a wonderful school year! Stay safe.