

## Transcript for MSDE-MCAP Holistic Rubric for Reasoning Items

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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 reasoning items. There is another webinar that focuses on holistic rubric for modeling items.

The outcomes of this webinar are the following: Review the MCAP holistic rubrics for reasoning items, understand the difference between the MCAP holistic rubric and the PARCC rubric, score the responses of reasoning items by using the MCAP holistic rubric and compare scoring student responses using the PARCC rubric and the MCAP holistic rubric. In MCAP math assessments, we have 1-point, 3-point and 4-point reasoning 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. How are the MCAP holistic rubrics different than the PARCC rubrics? With PARCC student scores were based on the point by point rubric as listed in a unique rubric for individual items. So, it is an element specific rubric. A Holistic rubric is a better way of assessing student without using the point by point elements of the PARCC rubric. A holistic rubric looks at the student response as a whole. Therefore, we feel that the holistic rubrics are appropriate for summative assessments because they provide an overall evaluation of a student's product or performance. A 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 reasoning items, with the lowest level of proficiency of 0.

This is the 3-point holistic rubric for reasoning items. A three-point response for reasoning items provides evidence of correct, complete, and appropriate mathematical reasoning. A two-point response for reasoning items provides evidence of partially correct mathematical reasoning. A one-point response for reasoning items provides limited evidence of correct mathematical reasoning. A zero-point response is completely incorrect, incoherent and/or irrelevant.

This is the holistic rubric for 4-point reasoning items. The scale is similar to the 3-point holistic rubric. A four-point response for reasoning items provides evidence of correct, complete, and appropriate mathematical reasoning. A three-point response for reasoning items provides evidence of essentially correct, complete, and appropriate mathematical reasoning. It may have minor flaws. A two-point response for reasoning items provides evidence of partially correct mathematical reasoning. A one-point response for reasoning items provides limited evidence of correct mathematical reasoning. And 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 4-point Grade 5 PARCC item. Diana has 1 square yard of fabric. She will make one pillow that requires  $\frac{3}{8}$  square yard of fabric and another pillow that requires  $\frac{2}{8}$  square yard of fabric. Diana uses the equations shown to explain her process to find the number of square yards of fabric she will use and the number of square yards of fabric she will have left.  $\frac{3}{8} + \frac{2}{8} = \frac{5}{16}$  square yard of fabric will be used.  $1 - \frac{5}{16} = \frac{16}{16} - \frac{5}{16} = \frac{11}{16}$  square yard of fabric will be left. Diana made an error in her process. Write and solve equations to explain how to correctly find the amount of fabric she will use and the amount of fabric she will have left. Be sure to include the amount of fabric Diana will use and the amount of fabric she will have left in your explanation. Enter your equations, your answers, and your work or explanation in the space provided. I will show you the PARCC rubric in the next slide.

This is the PARCC rubric for the item you saw in the last slide. In the next slide, you will see the question and the rubric side by side. For a score of 4, student response includes the following 4 elements. Computation component 1 point. Correct amount of fabric Diana will use,  $\frac{5}{8}$  square yard. Computation component 1 point. Correct amount of fabric Diana will have left,  $\frac{3}{8}$  square yard. Reasoning component 1 point. Equations to explain how to correctly find the amount of fabric Diana will use. Reasoning component 1 point. Equations to explain how to correctly find the amount of fabric Diana will have left. Sample student response: Diana will use  $\frac{5}{8}$  square yard of fabric and will have  $\frac{3}{8}$  square yard of fabric left.  $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$ . To subtract  $\frac{5}{8}$  from 1, I used  $\frac{8}{8}$  to represent 1 whole.  $\frac{8}{8} - \frac{5}{8} = \frac{3}{8}$  or other valid response. For a score of 3, student response includes 3 of the 4 elements. For a score of 2, student response includes 2 of the 4 elements. For a score of 1, student response includes 1 of the 4 elements. For a score of 0, student response is incorrect or irrelevant.

Take notice that the PARCC rubric includes 4 elements, first two are labeled as computation, and the last two are labeled as reasoning components. A score of 4 is given to the student response, if it has all 4 elements. A score of 3 is given to the student response, if it has all 3 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 when scoring student responses. If the students miss a minor step, they could still be 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. The student includes each of the four required elements. The amount of fabric Diana will use is correctly calculated as  $\frac{5}{8}$ . The response demonstrates with an equation how to add fractions with a common denominator. The amount of fabric Diana will have left is correctly calculated. The response explains how to subtract a fraction from a whole. Note that because the units are specified as square yards in the prompt, all responses are assumed to be square yards unless otherwise labeled. Under the new MCAP rubric, this response receives 4 points because this response provides evidence of correct, complete, and appropriate mathematical reasoning. The response demonstrates a thorough understanding of the mathematics; and it is clear and free from errors.

According to the PARCC rubric, this response receives partial credit, which is 3 points. The student includes three of the four required elements. The amount of fabric Diana will use is correctly calculated. The response demonstrates with an equation how to add fractions with a common denominator. The amount of fabric Diana will have left is correctly calculated. But the equation explaining how to subtract a fraction from a whole is not provided. According to the MCAP holistic rubric, this response would likely receive 3 points because the response is developed with logical reasoning with appropriate representations and also the answers to the questions are correct. The student probably subtracted  $\frac{5}{8}$  from 1 whole in his or her head and found the result. Remember that the question prompts student to write and solve an equation to find the answer.

This response receives partial credit because the student includes two of the four required elements according to the PARCC rubric. The amount of fabric Diana will use is correctly calculated. The explanation of how to add fractions with a common denominator is incomplete. In order to receive credit, the explanation must demonstrate the addition using an equation. The amount of fabric Diana will have left is correctly calculated. An equation showing how to subtract a fraction from a whole is not provided. Therefore this response receives 2 points. According to the MCAP rubric, this response would likely get 3 points out of 4 points. The student answered the questions correctly. The response shows a valid reasoning. And the only missing part is the writing and solving an equation.

Here is another example. This response gets partial credit, Score Point 1 in the PARCC rubric. The student includes one of the four required elements. The amount of fabric Diana will use is correctly calculated. An equation showing how to add fractions with a common denominator is not provided. The amount of fabric Diana will have left is not provided, either. An equation showing how to subtract a fraction from a whole is not provided in this student response.

According to the MCAP rubric, this response would likely receive 1 point. It has the correct answer to one of the questions and the work is missing.

This is another student response. This response gets Score Point 0 using the PARCC rubric. The response receives no credit. The student includes none of the four required elements. The amount of fabric Diana will use is incorrect. The response demonstrates with an equation how to add fractions, however since the equation used was not the equation required in the prompt, the explanation does not receive credit. The amount of fabric Diana will have left is not calculated. An equation showing how to subtract a fraction from a whole is not provided, either. Similarly, this response would likely get 0 using the MCAP holistic rubric. Because the work is completely incorrect and irrelevant.

This is an example of a 3-point Grade 7 PARCC item. The graph shows the distance a car is driven for each gallon of gas used. The graph title is Distance versus Gas Usage. The x-axis is labeled Amount of Gas used in gallons. The y-axis is labeled Distance driven in miles. The solid line starts at zero, goes through one, twenty; then two, forty; then three, sixty and then ends with an arrow pointing up at six, 120. Does the graph represent a proportional relationship? Explain your answer. How many miles can be driven using 5.5 gallons of gas? Use the graph to explain how you found the number of miles that can be driven using 5.5 gallons of gas. Enter your explanations and your answers in the space provided. I will show you the PARCC rubric for this item in the next slide.

This is the PARCC rubric for the Grade 7 item you just saw. For a score of 3, student response includes the following 3 elements. Computation component 1 point. Number of miles driven using 5.5 gallons of gas, 110 miles. Reasoning component 2 points. Correctly states graph does represent a proportional relationship and provide a valid explanation of why. Explanation provided for how to use the graph to find how many miles can be driven if 5.5 gallons of gas are used. Sample student response: The graph shown does represent a proportional relationship. A graph represents a proportional relationship if the line drawn passes through the origin and is a straight line. To determine how many miles you can drive on 5.5 gallons of gas, the points on the graph can be analyzed. If we look at the plotted points on the graph, the distance traveled is 20 miles on 1 gallon, 40 miles on 2 gallons, 60 miles on 3 gallons, and so on. Since the relationship is proportional, this pattern is true for all the miles traveled. Therefore, using ratios and a proportion,  $20/1 = x/5.5$ ,  $110 = x$  gallons, so the car travels a distance of 110 miles on 5.5 gallons of gas. Also accept a response of student 'went over' x units on the x-axis and up y units on the y-axis until the line was reached as a valid explanation for the second bullet. Or other valid response. For a score of 2, student response includes 2 of the 3 elements. For a score of 1, student response includes 1 of the 3 elements. For a score of 0, student response is incorrect or irrelevant.

As you see, the rubric includes 3 elements, first component is labeled as computation, and the last two are labeled as reasoning components. A score of 3 is given to the student response, if it has all 3 elements. A score of 2 is given to the student response, if it has only 2 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 the 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.

This response receives full credit. It includes each of the three required elements. The response states that the graph is proportional and provides an explanation of why by addressing the origin. Note that for this element the response should address the line going through the origin. It is not enough to state that the line is straight. The fact that the line is linear is not the same as showing it is proportional. The correct number of miles driven using 5.5 gallons of gas is stated. An explanation is provided for how to use the graph to find how many miles can be driven with 5.5 gallons of gas. It is not necessary to identify the x and y axes. A clear process of how to use the graph is provided. According to the MCAP holistic rubric, this response would get 3 points. The response is clear and well developed with appropriate explanation and correct mathematical vocabulary.

This student response gets partial credit of 2 points. It includes two of the three required elements according to the PARCC rubric: The correct number of miles driven using 5.5 gallons of gas is stated. The label of miles is not needed. An explanation is provided for how to use the graph to find how many miles can be driven with 5.5 gallons of gas. A clear process of how to use the graph is provided. The response incorrectly states the graph does not represent a proportional relationship and provides an incorrect explanation. Let's score this student response using our MCAP holistic rubric. Would you give this student 2 points or 3 points? Think about it. The student would likely get 2 points because the correct mathematical vocabulary wasn't used and the answer to the first question is incorrect.

This response receives partial credit. It includes one of the three required elements: The response states that the graph is proportional and provides an explanation of why by addressing the origin. An incorrect number of miles driven using 5.5 gallons of gas is stated. An incorrect explanation is provided for how to use the graph to find how many miles can be driven with 5.5 gallons of gas. Therefore, this response has 1 point using the PARCC rubric. How would you score this response using the MCAP holistic rubric? Would you give the student 2 points because 105 is the incorrect answer along with the reasoning? Or would you give this student 1 point because the work contains errors in the reasoning?

This last example shows a response of 0 points. The response receives no credit. It includes none of the three required elements: Although the response states the graph is proportional,

the explanation is insufficient. Just stating the coordinates, is not sufficient to show understanding of proportionality. Labeling the coordinates is not acceptable for determining the ratio of one gallon per 20 miles. Note that the labeling of points or statements referring to the graph going up by 20 each time are not sufficient to show understanding of proportionality. The fact that the line is linear is not the same as showing it is proportional. These types of responses are too general. An incorrect number of miles driven using 5.5 gallons of gas is stated. No explanation is provided for how to use the graph to find how many miles can be driven with 5.5 gallons of gas. Let's score this response using the MCAP holistic rubric. What score would you give to the student for partial incorrect reasoning? Take a few minutes and think about how you would score this response.

Thank you for being with us today. I hope you have a deeper understanding of the MCAP holistic rubric for reasoning items. Have a wonderful school year!