

2026 MCAS Sample Student Work and Scoring Guide

Grade 6 Mathematics

Question 14: Constructed-Response

Reporting Category: Statistics and Probability

Standard: [6.SP.B.5](#) - Summarize numerical data sets in relation to their context.

Item Description: Determine and compare measures of center and variability given a data set and a real-world situation.

Calculator: Not allowed

This item can be found in the released item sets on the [MCAS Resource Center](#).

Scoring Guide

Select a score point in the table below to view the sample student response.

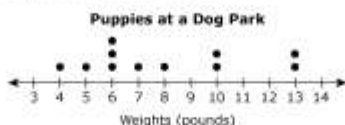
Score*	Description
4A 4B	The student response demonstrates an exemplary understanding of the Statistics and Probability concepts involved in summarizing numerical data sets in relation to their context. The student correctly determines the range, the mean, and the median of a set of data, and determines the effect that an additional piece of data has on the range, the mean, and the median.
3	The student response demonstrates a good understanding of the Statistics and Probability concepts involved in summarizing numerical data sets in relation to their context. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points.
2	The student response demonstrates a fair understanding of the Statistics and Probability concepts involved in summarizing numerical data sets in relation to their context. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points.
1	The student response demonstrates a minimal understanding of the Statistics and Probability concepts involved in summarizing numerical data sets in relation to their context.
0	The student response contains insufficient evidence of an understanding of the Statistics and Probability concepts involved in summarizing numerical data sets in relation to their context. As a result, the response does not merit any points.

*Letters are used to distinguish between sample student responses that earned the same score (e.g., 4A and 4B).

Score Point 4A

This question has four parts.

On Tuesday, a researcher weighed 11 puppies that were playing at a dog park. This dot plot shows the weights, in pounds, of the puppies the researcher weighed.

**Part A**

Based on the dot plot, what is the range, in pounds, of the weights of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

Based on the dot plot, the range in pounds of the weights of the puppies is 4 - 13 or 9. I know this because the smallest number there is a dot on is 4 and the biggest number there is a dot on is 13.

Part B

Based on the dot plot, what is the median weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The median weight in pounds of the puppies is 7. I know this because put the data in order and found the median by crossing out the numbers until I got to the middle of the data.

Part C

Based on the dot plot, what is the mean weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The mean weight in pounds of the puppies is 8. I know this because I added the weights of all of the puppies together then I divided it by 11 because that's how many puppies there were.

Part D

One more puppy arrived at the dog park. The new puppy weighed 8 pounds. The weight of the new puppy will be included in the dot plot.

Which of the measures of the data in the dot plot—the range, the median, or the mean—will change when the weight of the new puppy is included with the other weights? Explain your reasoning.

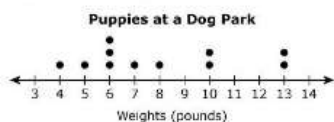
Enter your answer and your explanation in the space provided.

The measures, range and mean will not change because the new puppy arrived. I know this because the new puppy's weight is not less than 4 or more than 13 so the range can't change. The mean wouldn't change even though the numbers are different because I added 8 to 88 which is 96 then you have to divide it by the number of puppies there are now which is 12 and 96 divided by 12 is 8. In the original data, the mean was also 8. The measure of data, median would change. The median would change because there's another weight and it would change where the middle is in the data.

Score Point 4B

This question has four parts.

On Tuesday, a researcher weighed 11 puppies that were playing at a dog park. This dot plot shows the weights, in pounds, of the puppies the researcher weighed.

**Part A**

Based on the dot plot, what is the range, in pounds, of the weights of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The range is the lowest number of the set (4, in our case) subtracted from the highest number in the set (13, in our case). This means the range is $13 - 4$. Since $13 - 4 = 9$, the range is 9.

Part B

Based on the dot plot, what is the median weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

To find the median, you need to find the middle number when the set is written in order, which is the first step to finding it.

$\{4, 5, 6, 6, 6, 7, 8, 10, 10, 13, 13\}$

Then you find the middle number of the set, which is 7.

This means, the median is 7lbs.

Part C

Based on the dot plot, what is the mean weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

Since mean is calculated by finding the quotient of the sum of numbers by the number of numbers, you would first have to add all the numbers.

$$4 + 5 + 6 + 6 + 6 + 7 + 8 + 10 + 10 + 13 + 13 = 88$$

Now you have to divide the sum of the numbers by the number of numbers, which is 11.

$$88 \div 11 = 8$$

So, the mean is 8lbs.

Part D

One more puppy arrived at the dog park. The new puppy weighed 8 pounds. The weight of the new puppy will be included in the dot plot.

Which of the measures of the data in the dot plot—the range, the median, or the mean—will change when the weight of the new puppy is included with the other weights? Explain your reasoning.

Enter your answer and your explanation in the space provided.

Range: We know the range is not the answer because the highest values and the lowest values do not change, giving us the same result.

Median: We know the median changes because, when putting the numbers in a number set in order, it looks like this - $\{4, 5, 6, 6, 6, 7, 8, 8, 10, 10, 13, 13\}$

Finding the middle number, we come in between 7 and 8. This means we have to find the average between the two numbers, which is $\frac{7+8}{2} = \frac{15}{2} = 7.5$, which is not the original median of 7.

Mean: To find if the mean is the same, we have to calculate.

$$4 + 5 + 6 + 6 + 6 + 7 + 8 + 8 + 10 + 10 + 13 + 13 = 96$$

Since we know have 12 values, we divide by 12.

$$96 \div 12 = 8$$

This means that the mean still holds the original value of 8.

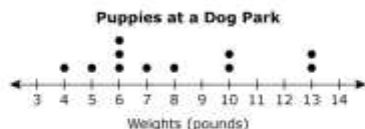
This means that the median is the measure that will change.

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Score Point 3

This question has four parts.

On Tuesday, a researcher weighed 11 puppies that were playing at a dog park. This dot plot shows the weights, in pounds, of the puppies the researcher weighed.

**Part A**

Based on the dot plot, what is the range, in pounds, of the weights of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The range of the weights of puppies in the dot plot is 9 pounds. I arrived at this answer because in order to find the range, you must subtract the smallest value in the data from the largest value in the data which was $13 - 4 = 9$.

Part B

Based on the dot plot, what is the median weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The median of the weight from the puppies is 7 pounds. I arrived at this answer because in order to find the median, you order the numbers from least to greatest, and find whichever number is in the middle of the data, which is 7.

Part C

Based on the dot plot, what is the mean weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The mean of the weight of puppies is 8 pounds. I arrived at this answer because in order to find the mean you must find the sum of all the data in the set, then divide by the number of variables in your data: $\text{Sum} = 88$, 11 variables, $88 \div 11 = 8$.

Part D

One more puppy arrived at the dog park. The new puppy weighed 8 pounds. The weight of the new puppy will be included in the dot plot.

Which of the measures of the data in the dot plot—the range, the median, or the mean—will change when the weight of the new puppy is included with the other weights? Explain your reasoning.

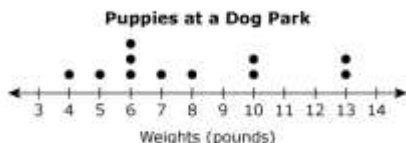
Enter your answer and your explanation in the space provided.

The mean of the weight of puppies will change. This is because in order to find the mean, you must add all the numbers in your data set and divide the sum by the number of variables in your data. There is now one new variable that hasn't been included.

Score Point 2

This question has four parts.

On Tuesday, a researcher weighed 11 puppies that were playing at a dog park. This dot plot shows the weights, in pounds, of the puppies the researcher weighed.

**Part A**

Based on the dot plot, what is the range, in pounds, of the weights of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The range is 13 puppies because the maximum of puppies on this graph is 13.

Part B

Based on the dot plot, what is the median weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

The median weight of puppies is 7 because if you list all of the weights of the puppies like this: 4,5,6,6,6,7,8,10,10,13,13 you can see that the middle is 7 which means 7 is the median.

Part C

Based on the dot plot, what is the mean weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$4 + 5 + 6 + 6 + 6 + 7 + 8 + 10 + 10 + 13 + 13 = 88$ pounds.
 $88 \div 11 = 8$ pounds

Part D

One more puppy arrived at the dog park. The new puppy weighed 8 pounds. The weight of the new puppy will be included in the dot plot.

Which of the measures of the data in the dot plot—the range, the median, or the mean—will change when the weight of the new puppy is included with the other weights? Explain your reasoning.

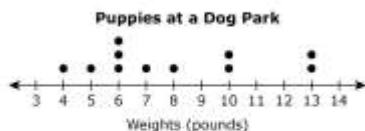
Enter your answer and your explanation in the space provided.

All of them will change because there is a new piece of data that could effect the whole chart.

Score Point 1

This question has four parts.

On Tuesday, a researcher weighed 11 puppies that were playing at a dog park. This dot plot shows the weights, in pounds, of the puppies the researcher weighed.

**Part A**

Based on the dot plot, what is the range, in pounds, of the weights of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$26 - 4 = 22 \text{ pounds}$$

Part B

Based on the dot plot, what is the median weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

8 and 9 are in the middle.

$$\frac{8+9}{2} = 8 \text{ pounds}$$

Part C

Based on the dot plot, what is the mean weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

$$4 + 35 + 18 + 7 + 8 + 20 + 26$$

$$= 88$$

$$\frac{88}{11} = 8 \text{ pounds}$$

Part D

One more puppy arrived at the dog park. The new puppy weighed 8 pounds. The weight of the new puppy will be included in the dot plot.

Which of the measures of the data in the dot plot—the range, the median, or the mean—will change when the weight of the new puppy is included with the other weights? Explain your reasoning.

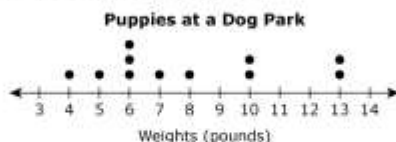
Enter your answer and your explanation in the space provided.

The mean will change since it is the only measure that uses the amount of puppies.

Score Point 0

This question has four parts.

On Tuesday, a researcher weighed 11 puppies that were playing at a dog park. This dot plot shows the weights, in pounds, of the puppies the researcher weighed.

**Part A**

Based on the dot plot, what is the range, in pounds, of the weights of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

11 because i added all the numbers together and got 11

$$1 + 1 + 3 + 1 + 1 + 2 + 2$$

Part B

Based on the dot plot, what is the median weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

6 because it has the most amount of points on the dot plot

Part C

Based on the dot plot, what is the mean weight, in pounds, of the puppies? Show or explain how you got your answer.

Enter your answer and your work or explanation in the space provided.

3,9,11,12,14 because the are the only numbers on the dot plot that have no points

Part D

One more puppy arrived at the dog park. The new puppy weighed 8 pounds. The weight of the new puppy will be included in the dot plot.

Which of the measures of the data in the dot plot—the range, the median, or the mean—will change when the weight of the new puppy is included with the other weights? Explain your reasoning.

Enter your answer and your explanation in the space provided.

Yes, because you'd have to add it with the range so you'd have to re do it