

MA.5.DP.1.2

Overarching Standard: *MA.5.DP.1: Collect, represent and interpret data and find the mean, mode, median or range of a data set.*

Benchmark of Focus

MA.5.DP.1.2: Interpret numerical data, with whole-number values, represented with tables or line plots by determining the mean, mode, median or range.

Examples: Rain was collected and measured daily to the nearest inch for the past week. The recorded amounts are 1, 0, 3, 1, 0, 0 and 1. The range is 3 inches, the modes are 0 and 1 inches, and the mean value can be determined as $\frac{1+0+3+1+0+0+1}{7}$, which is equivalent to $\frac{6}{7}$ of an inch. This mean would be the same if it rained $\frac{6}{7}$ of an inch each day.

Benchmark Clarifications

Clarification 1: Instruction includes interpreting the mean in real-world problems as a leveling out, a balance point or an equal share.

Related Benchmark/Horizontal Alignment

- MA.5.FR.1.1
- MA.5.AR.1.1

Vertical Alignment

Previous Benchmarks

MA.4.DP.1.2

Next Benchmarks

MA.6.DP.1.2

MA.6.DP.1.6

Terms from the K-12 Glossary

- Line Plots
- Mean
- Median
- Mode
- Range

Purpose and Instructional Strategies

The purpose of this benchmark is to interpret numerical data by using the mean, mode, median and range. This work builds on the previous understanding of mode, median, and range in Grade 4 (MA.4.DP.1.2). In Grade 6, a focus will be on comparing the advantages and disadvantages of the mean and median.

- When finding median and mode, it is important for students to organize their data, putting it in order from least to greatest.
- With the data organized, students can determine:
 - range by subtracting the least value from the greatest value in the set.

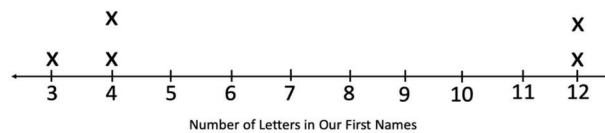
- mode by finding the value that occurs most often.
- median by finding the value in middle of the set.
- mean by finding the average of the set of numbers.

Common Misconceptions or Errors

- Students may confuse the mean and median of a data set. During instruction, teachers should provide students with examples where the median and mean of a data set are not close in value.

Strategies to Support Tiered Instruction

- Instruction includes examples where the mean and the median are not close in value and uses a data set to explain the difference between mean and median.
 - For example, the data set shown has a median of 4 and a mean of 7. The teacher uses the data to model how the mean is calculated and how the median is found.



- Instruction includes writing the data on index cards or sticky notes. Students can then easily arrange the data in order from least to greatest. This will assist in finding the median of the data set.
 - For example, students use the data shown to explain the difference between mean (which is 7) and median (which is 4) and to model how the mean is calculated and how the median is found.



Questions to ask students:

How does organizing your data help you to determine the mean, median, mode and range?

- Sample answer that indicates understanding: Organizing the data is helpful to find each the mean, median, mode and range of a data set. When data is organized from least to greatest, each portion can be found much easier. For example, mode is much easier to determine when the data is presented in an organized matter because one can clearly see the data that has occurred most frequently.

What does the mean help you to understand about a set of data?

- Sample answer that indicates understanding: The mean helps you to understand the average or most typical value within the data set. For example, a mean of 12 flowers per plant indicates that a typical amount of flowers for one plant is 12.

The cafeteria collected data on the number of snacks bought per day over the course of 10 days:

Determine the mean, median, mode and range of the data.

- Sample answer that indicates understanding: The mean is found by adding

all of the Number of Snacks and dividing by 10, the total number of days data was collected. *The mean is 20.* The median is the mid point of the data. Because there are an even number of data points, take the two in the middle (19, 20) and divide by 2. *The median is 19.5.* The mode is the most frequent data point; *15 is the mode* as it occurs three times within the data set. Finally, the range is the difference between the highest and the lowest data points (29-14). *The range is 15.*

Day:	Number of Snacks:
1	15
2	25
3	26
4	14
5	22
6	15
7	29
8	19
9	20
10	15

If the cafeteria needs to sell an average of 25 snacks per day, are they meeting this goal based upon the data?

- Sample answer that indicates understanding: The mean of this data set was 20, which does not meet the goal that the cafeteria set for each day.

Instructional Tasks

Instructional Task 1

Bobbie is a fifth grader who competes in the 100-meter hurdles. In her 8 track meets during the season, she recorded the following times to the nearest second.

Track Meet	100-meter hurdle Time (seconds)
1	18
2	31
3	17
4	20
5	17
6	36
7	17
8	18

Part A. What is the mean time, in seconds, of Bobbie's 100-meter hurdles?

Part B. What is the median time, in seconds, of Bobbie's 100-meter hurdles?

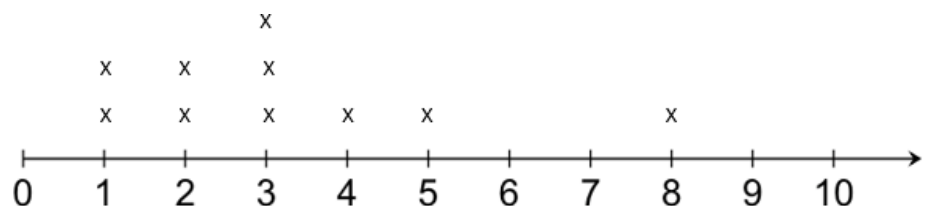
Part C. What is the mode time, in seconds, of Bobbie's 100-meter hurdles?

Part D. If you were Bobbie, which of these results would you report to your friend?

Instructional Items

Instructional Item 1

There was a pie-eating contest at the county fair. The line plot below shows the number of pies each of the 10 contestants ate. Use the line plot to determine the mean, mode, median and range of the data.



Achievement Level Descriptors

Benchmark		Context	Assessment Limits
<p>MA.5.DP.1.2 Interpret numerical data, with whole-number values, represented with tables or line plots by determining the mean, mode, median or range.</p> <p>Example: Rain was collected and measured daily to the nearest inch for the past week. The recorded amounts are 1, 0, 3, 1, 0, 0 and 1. The range is 3 inches, the modes are 0 and 1 inches and the mean value can be determined as $(1+0+3+1+0+0+1)$ which is equivalent to $\frac{6}{7}$ of an inch. This mean would be the same if it rained $\frac{6}{7}$ of an inch each day.</p> <p>Clarification 1: Instruction includes interpreting the mean in real-world problems as a leveling out, a balance point or an equal share</p>		Both	Items must include finding only the mean or finding the mean and one or more additional statistical measures. Items must present numerical data in tables or line plots.
ALD 2	ALD 3	ALD 4	ALD 5
N/A	Interprets numerical data, represented with tables or line plots, by determining the mean	Interprets numerical data, with whole-number values, represented with tables or line plots by determining the mean, mode, median, or range.	N/A

Additional Resources:

[CPALMS](#) Resources

Resources/Tasks to Support Your Child at Home:

[Khan Academy](#): Mean, Median and Mode

[LearnZillion](#): Use and Find the Range of a Data Set