



5.DA.2: Calculate measures of central tendency (mean, median, and mode) to describe a data set. Analyze data sets to determine which measure of central tendency appropriately describes the distribution of data. (E)

Reporting Category: Geometry, Measurement, and Data Analysis

Subdomain: Measurement and Data Analysis

5.DA.2 Instructional Framework

Assessed On:

☐ Checkpoint 1

☐ Checkpoint 2

☒ Checkpoint 3

☒ Summative

Content Limits:

- Use only whole numbers for data points.
- Include 7 to 11 data points within any given data set.
- In items that require the student to calculate the mean of a data set, the mean must be a whole number.

Clarifications:

- The mean can be affected by outliers and should not be used if an outlier drastically affects the mean.
- The keypad in the ILEARN testing system does not allow students to enter a comma between each period in a multi-digit number. (Example: 13,323 would be entered as 13323.)

Calculator Availability: Not allowed

Expected Academic Vocabulary: measures of central tendency, mean, median, mode, data set, distribution of data, and outlier

Examples of Context and Varying Difficulty Levels

Context: Easy	Uses 7 data values. Measure of central tendency is limited to mode.
Context: Medium	Uses 7-11 data values. Measures of central tendency are limited to mode and median.
Context: Difficult	Uses 7-11 data values. Measures of central tendency include mode, median, and/or mean.

Proficiency Level Descriptors and Example Items

Looking Back:

This concept is not specifically addressed in the Indiana Academic Standards prior to this grade level.

Looking Ahead:

[6.DS.3 ILEARN Item Specification](#)



Below Proficiency: Identify data sets that are best represented by the mode or the median. Given a numerical data set, calculate the mode and median of the set.

A data set is given.

5, 5, 6, 7, 8, 10, 10, 11, 13

What is the median of the data set?

Answer: 8

DOK 1 because students must use the definition of median for their response.

This is medium difficulty because it uses 7-11 data values and its measure of central tendency is median.

A data set is given.

5, 5, 5, 6, 7, 8, 10, 10, 11, 13

What is the mode of the data set?

Answer: 5

DOK 1 because students must use the definition of mode for their response.

This is medium difficulty because it uses 7-11 data values and its measure of central tendency is mode.

Approaching Proficiency: Identify data sets that are best represented by the mean. Given a numerical data set, calculate the mean of the set.

A set of data is given.

5, 13, 5, 7, 6, 10, 10, 8, 11, 5

What is the mean of the data?

Answer: 8

DOK 2 because students must use the definition and calculation of mean for their response.

This is difficult because it uses 7-11 data values. Measures of central tendency include mode, median, and/or mean.

At Proficiency: Analyze a data set or graphical representation to determine which measure of central tendency best describes the distribution of data; OR Calculate the mean, median or mode from a given graphical representation.

The data set given shows the ages of some of the attendees at a recent

DOK 2 because



theater event.

24, 52, 22, 53, 35, 24, 54, 27, 24

Match each number in the table to the measure of central tendency it represents for the given data set.

	Mean	Median	Mode
24	☐	☐	☐
27	☐	☐	☐
35	☐	☐	☐

Answer:

	Mean	Median	Mode
24	☐	☐	☒
27	☐	☒	☐
35	☒	☐	☐

students must use the definitions of mean, mode, and median and calculation of mean for their response.

This is difficult because it uses 7-11 data values. Measures of central tendency include mode, median, and/or mean.

A student asks her classmates how many pets they have. A frequency table of her data is given.

DOK 1 because students must use the definition of mode for their response.

This is medium difficulty because it uses 7-11 data values and its measure of central tendency is mode.



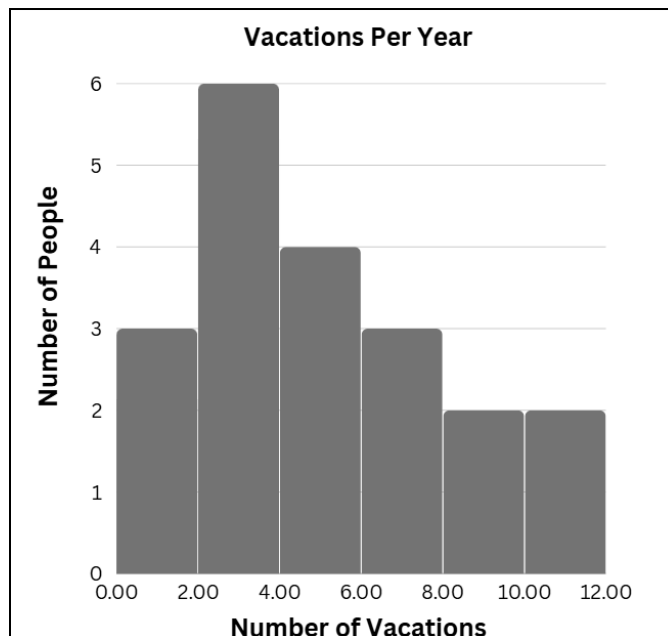
Number of Pets	Tally Marks	Frequency
0		5
1		4
2		0
3		2
		Total = 11

What is the mode of the data set?

Answer: 0

A travel company surveyed its customers to find out how often they vacation each year.

The data collected is recorded in the histogram.



This is a DOK 2 item because students must analyze the graphical representation of a data set to determine and justify the best measure of central tendency.

This is a difficult item because it uses 7-11 data values and has students consider all three measures of central tendencies.



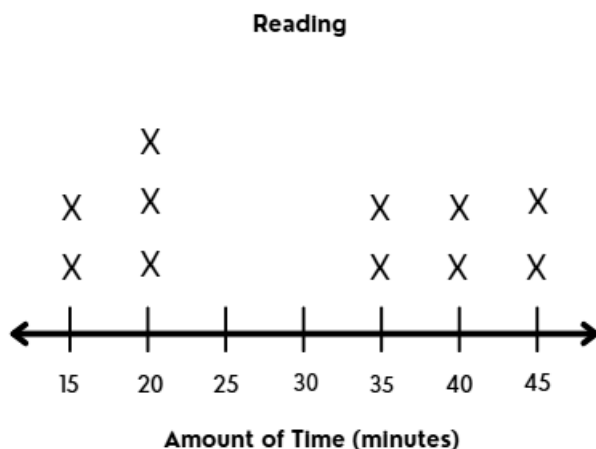
Which statement **best** describes the measure of central tendency the travel company should use to represent their data?

- a. The mean, because the average best represents the data.
- b. The mean, because it best represents categorical data.
- c. The median, because the middle data point best represents the data.
- d. The mode, because the most frequent data point best represents the data.

Answer: d

Above Proficiency: Evaluate given statements about central tendency related to a given graph. Determine missing data points from a set given an incomplete set and mean, median, or mode.

A teacher asks 11 students to state the amount of time, to the nearest five minutes, they spent reading at home the night before. He records the results on the line plot.



DOK 3 because students must use the definitions of mean, mode, and median and calculation of mean for their response. They must also compare the results.

This is difficult because it uses 7-11 data values. Measures of central tendency include mode, median, and/or mean.

Which statement about the results is true?

- a. The median is equal to the mean.
- b. **The mean is less than the median.**
- c. The mode is equal to the mean.
- d. The mode is greater than the mean.

Answer: b

A scientist collected the high temperature, to the nearest 5 degrees, over

DOK 3 because



the last seven days.

55, 50, 65, 60, 75, 70, 70

What does the high temperature need to be on the next day to have a mean temperature of 65 degrees?

degrees

Answer: 75

students must use the definition and calculation of mean for their response. Students must also apply greater cognitive effort to correctly respond.

This is difficult because it uses 7-11 data values. Measures of central tendency include mode, median, and/or mean.