

Lesson 11.2

TEKS
7.12A
7.1F

Comparing Data Displayed in Dot Plots

Q: How do you compare 2 sets of data displayed in dot plots?

A: Compare the _____, the _____, and the _____ of the dots in the 2 plots. Also compare the _____ and the _____ of the dot plots numerically.

Vocab

Shape: _____

Center: _____

Spread: _____

Median: _____

Range: _____

Mean: _____

Mode: _____



Shape: _____

Center: _____

Spread: _____

Mean: _____

Mode: _____

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Comparing Data Displayed in Dot Plots

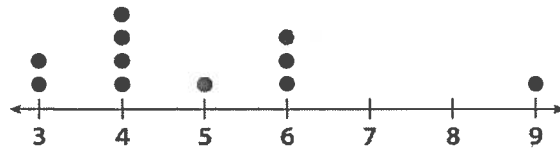
Reading Strategies: Understanding Vocabulary

Central measures of a data set should be used that give the most accurate picture of how the data are distributed. This can have an effect on how one data set compares to another.

Mean, Median, and Mode

These three central measures are used most often in describing a data set. However, depending on how the data are distributed, one measure can be more accurate than another.

Example



Mean \longrightarrow Add the values and divide by the *number* of values.

$$(2 \times 3 + 4 \times 4 + 1 \times 5 + 3 \times 6 + 1 \times 9) \div 11 = 4.9$$

Mode \longrightarrow Occurs most frequently: 4

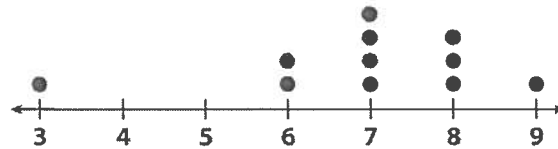
Median \longrightarrow The "middle" value: 4

Two of the central measures have the same value, but the third is larger. This is often caused by an **outlier** data value that is much larger or smaller than most of the data values. The outlier also has an effect on the **range**, another measure of how widely data values are distributed. The outlier has an effect on the mean, too.

Outlier \longrightarrow 9 **Range** \longrightarrow 9 - 3, or 6

Without the outlier, the range would be 3 and the mean would be 4.5.

Find the central measures with and without the outlier.



1. With the outlier

2. Without the outlier

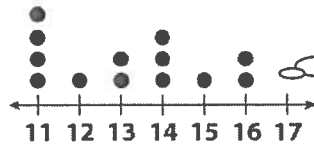
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Comparing Data Displayed in Dot Plots

Success for English Learners

Problem 1

What is the mode?



Which value appears the most often? **11** is the mode.

What is the median?

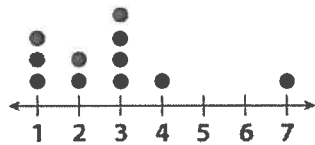


The median is 13.

What is the "middle" value? There are 13 numbers, so the 7th number is the middle.

Problem 2

What is the outlier?



The outlier is much larger or smaller than the rest of the values.

The outlier is 7.

What is the mean of *all* of the data? $(1 \times 3 + 2 \times 2 + 3 \times 4 + 1 \times 4 + 1 \times 7) \div 11$

The mean is about **2.7**.

What is the mean *without* the outlier? $(1 \times 3 + 2 \times 2 + 3 \times 4 + 1 \times 4) \div 10$

The mean is about **2.3**.

1. How would you find the median in Problem 1 if there were 12 dots?

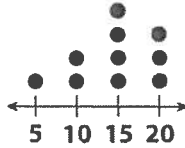
2. What would the mode be in Problem 2 if both "1" and "3" had four dots?

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Comparing Data Displayed in Dot Plots

Practice and Problem Solving: D

Answer the questions for each dot plot. The first one is done for you.

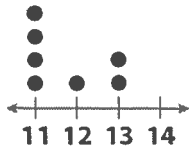


1. What is the range of the data? 15

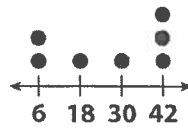
2. Since there is an even number of dots, the *median* is halfway between the values of the two middle data points. What is the median?

3. The *mode* is the value of the data point that appears the most often. What is the mode?

Answer the questions about the two dot plots.



Plot X



Plot Y

4. Which data set has the larger range? Explain.

5. Which data set has the mode with the most equivalent elements, or dots? Explain.

6. What is the median of Plot X?

7. What is the median of Plot Y?

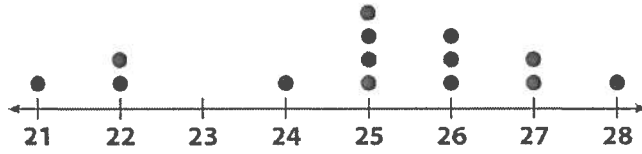
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Comparing Data Displayed in Dot Plots

Practice and Problem Solving: A/B

Find the values for each dot plot.

1.

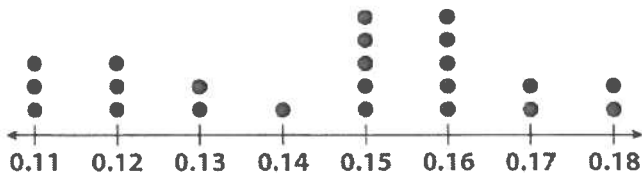


Range:

Median:

Mode:

2.

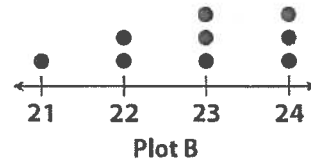
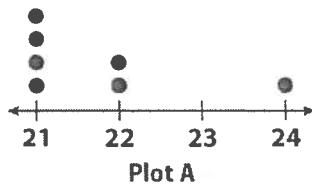


Range:

Median:

Mode:

Compare the dot plots by answering the questions.



3. How do the ranges compare?

4. Compare the number of elements.

5. How do the modes compare?

6. How do the medians compare?

7. Describe the distribution of the dots in each plot.

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Comparing Data Displayed in Dot Plots

Q: How do you compare 2 sets of data displayed in dot plots?

A: Compare the shapes, the center, and the spread of the dots in the 2 plots. Also compare the median and the range of the dot plots numerically.

Vocab

- Shape: the outline of what the data may look like
- Center: the middle data point
- Spread: difference in the highest and lowest data points
- Median: Middle data point
- Range: difference in the highest and lowest data points
- Mean: Average of all data points
- Mode: Most the data point that happens the most times in the set



Shape: Majority of the data points left of #3 with #2 having the most

Center: Median is #2

Spread: $8 - 0 = 8$

Mean: Average is 3.4 $0 + 1 + 1 + 2 + 2 + 2 + 2 + 4 + 5 + 7 + 7 + 8 = 41 / 12 = 3.4167$

Mode: #2 happens 4 times

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Comparing Data Displayed in Dot Plots

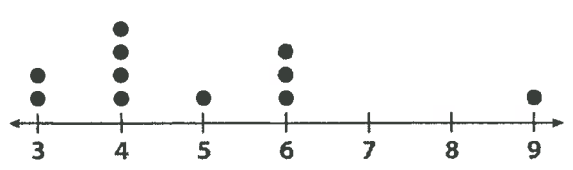
Reading Strategies: Understanding Vocabulary

Central measures of a data set should be used that give the most accurate picture of how the data are distributed. This can have an effect on how one data set compares to another.

Mean, Median, and Mode

These three central measures are used most often in describing a data set. However, depending on how the data are distributed, one measure can be more accurate than another.

Example



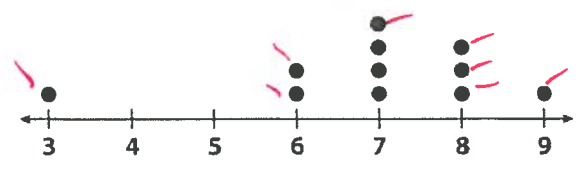
- Mean** → Add the values and divide by the *number* of values. Average
 $(2 \times 3 + 4 \times 4 + 1 \times 5 + 3 \times 6 + 1 \times 9) \div 11 = 4.9$
- Mode** → Occurs most frequently: 4 Most
- Median** → The "middle" value: 4 - Middle

Two of the central measures have the same value, but the third is larger. This is often caused by an **outlier** data value that is much larger or smaller than most of the data values. The outlier also has an effect on the **range**, another measure of how widely data values are distributed. The outlier has an effect on the mean, too.

Outlier → 9 **Range** → 9 - 3, or 6

Without the outlier, the range would be 3 and the mean would be 4.5.

Find the central measures with and without the outlier.



1. With the outlier

~~Mean~~ ~~Mode~~ ~~Median~~

Mean - 6.9
 Mode - 7
 Median - 7

2. Without the outlier

~~Mean~~ ~~Mode~~ ~~Median~~

Mean - 7.3
 Mode - 7
 Median - 7

Key

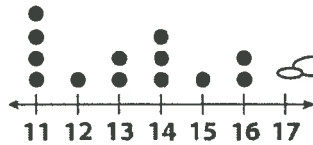
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Comparing Data Displayed in Dot Plots

Success for English Learners

Problem 1

What is the mode?



Which value appears the most often? **11** is the mode.

What is the median?

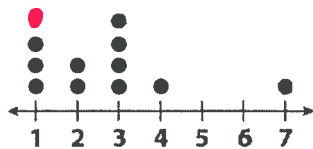


What is the "middle" value? There are 13 numbers, so the 7th number is the middle.

The median is 13.

Problem 2

What is the outlier?



The outlier is much larger or smaller than the rest of the values.

The outlier is 7.

What is the mean of *all* of the data? $(1 \times 3 + 2 \times 2 + 3 \times 4 + 1 \times 4 + 1 \times 7) \div 11$

The mean is about **2.7**.

What is the mean *without* the outlier? $(1 \times 3 + 2 \times 2 + 3 \times 4 + 1 \times 4) \div 10$

The mean is about **2.3**.

1. How would you find the median in Problem 1 if there were 12 dots?

Average the 6th and 7th dots' values

2. What would the mode be in Problem 2 if both "1" and "3" had four dots?

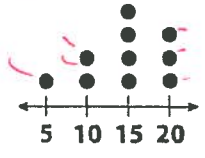
There will be 2 modes 1 and 3

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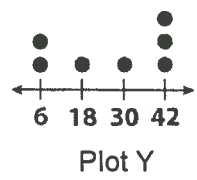
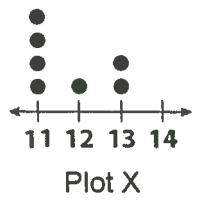
Practice and Problem Solving: D

Answer the questions for each dot plot. The first one is done for you.



1. What is the range of the data? 15
2. Since there is an even number of dots, the *median* is halfway between the values of the two middle data points. What is the median?
 $15 \times 2 \div 2 = 15$
3. The *mode* is the value of the data point that appears the most often. What is the mode?
15

Answer the questions about the two dot plots.



4. Which data set has the larger range? Explain.
Plot Y $42 - 6 = 36$ Plot X $13 - 11 = 2$
5. Which data set has the mode with the most equivalent elements, or dots? Explain.
Plot X 4 values of 11
6. What is the median of Plot X?
11
7. What is the median of Plot Y?
30