LESSON MAKER PRO

Spot the Spread

Compare what is typical and what stands out.

HIGH SCHOOL · A2S.DSP.C

A2S.DSP.C "Distributions of quantitative data (continuous or discrete) in one variable should be described in the context of the data with respect to what is typical (the shape, with appropriate measures of center and variability..."

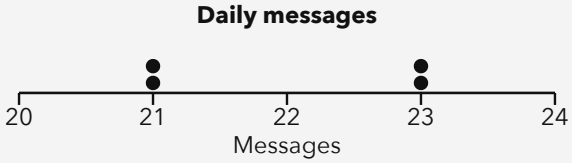
NAME _____ DATE _____

CENTER AND SPREAD

The mean describes the center. Population standard deviation (SD) measures spread: find each distance from the mean, square it, add the squares, divide by the number of values, then take the square root. A smaller SD means less spread, but an unusually high or low value can pull the mean away from what is typical.

WORKED EXAMPLE

Use the dot plot to find the mean and population SD.



1. Mean: (21 + 21 + 23 + 23) / 4 = 22.
2. Squared distances from 22: 1 + 1 + 1 + 1 = 4.
3. SD: square root of (4 / 4) = 1.

Answer: Mean: 22 messages; population SD: 1 message.

PRACTICE 4 problems

1 Find the mean and population SD of 5, 5, 7, 7.

ANSWER _____

2 Find the mean and population SD of 1, 1, 9, 9.

ANSWER _____

3 Set A is 6, 6, 10, 10. Set B is 4, 4, 12, 12. Find each population SD. Which set is less spread out?

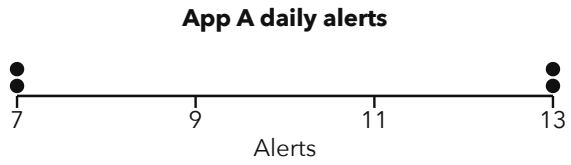
ANSWER _____

4 For 3, 4, 4, 5, 5, 6, 17, name the unusually high value and find the median.

ANSWER _____

APPLY IT Show your work

1 App A's daily alerts are plotted. App B has a mean of 10 alerts and a population SD of 4 alerts. Which app sends a more consistent number of alerts?



ANSWER _____

2 Your bike commute times are plotted. A friend's commute has a mean of 14 minutes and a population SD of 5 minutes. Whose commute is shorter on average, and whose times are more consistent?



ANSWER _____

CHALLENGE One step up

Streamer A's daily viewers, in hundreds, are 4, 4, 6, 6. Streamer B's are 4, 4, 6, 6, 30. Find both means. Why does B's median better describe a typical day than B's mean?

WORK SPACE AND ANSWER

ANSWER KEY # Spot the Spread

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the mean and population SD of 5, 5, 7, 7.	**Mean: 6; population SD: 1.**
2	Find the mean and population SD of 1, 1, 9, 9.	**Mean: 5; population SD: 4.**
3	Set A is 6, 6, 10, 10. Set B is 4, 4, 12, 12. Find each population SD. Which set is less spread out?	**A: 2; B: 4. Set A is less spread out.**
4	For 3, 4, 4, 5, 5, 6, 17, name the unusually high value and find the median.	**Unusually high value: 17; median: 5.**

PART 2 · APPLY IT

1. **App A.** App A has mean 10 and population SD 3 alerts. Its SD is smaller than App B's 4 alerts.
2. **Your friend's commute is shorter on average. Your times are more consistent.** Your mean is 15 minutes, compared with your friend's 14. Your population SD is 3 minutes, compared with your friend's 5.

CHALLENGE

A's mean is 5 hundred viewers. B's mean is 10 hundred viewers, but B's median is 6 hundred. The unusually high value of 30 raises B's mean far above most of B's daily counts.

SD refers to population SD throughout. Accept equivalent wording for consistency and for the effect of Streamer B's unusually high count.