

Measures of centre and spread



Read the mode, median, and range off each dot plot, then calculate or reason with the mean.

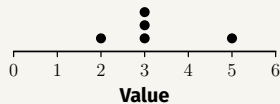
Name _____

Date _____

Reading a dot plot

On a dot plot, the **mode** is the tallest stack, the **median** is the middle dot (or the average of the two middle dots, if there's an even number), and the **range** is the distance from the first to the last occupied value. The **mean** must still be calculated: add every value and divide by how many there are. Always name the specific measure – avoid the word “average” on its own.

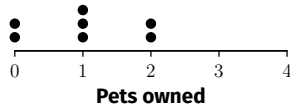
Worked example Find the mode, median, and range of this data set.



Mode: 3 (tallest stack). Median: 3 (middle of 5 values).
Range: $5 - 2 = 3$.

1. Find the mode, median, and range of this data set (pets owned by 7 families).

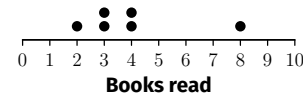
Solution: Mode: 1. Median: 1 (4th of 7 sorted values). Range: $2 - 0 = 2$.



Working

2. Calculate the mean number of books read.

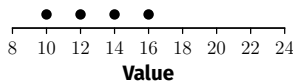
Solution: $(2 + 3 + 3 + 4 + 4 + 8) \div 6 = 24 \div 6 = 4$.



Working

3. These 4 values plus one more give a mean of 15. Find the missing value.

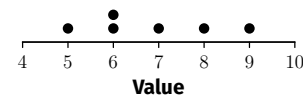
Solution: Total needed: $15 \times 5 = 75$. Known sum: $10 + 12 + 14 + 16 = 52$. Missing value: $75 - 52 = 23$.



Working

4. Explain how to find the median of these 6 values (an even number).

Solution: Average the 3rd and 4th sorted values: $(6 + 7) \div 2 = 6.5$.



Working

Measures of centre and spread (continued)



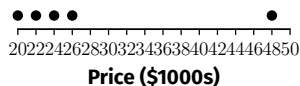
Read the mode, median, and range off each dot plot, then calculate or reason with the mean.

Name _____

Date _____

5. Calculate the mean and median. Which better represents a typical value, and why?

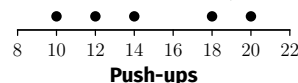
Solution: Mean: $140 \div 5 = 28$. Median: 24. The median is more typical – the \$48 price pulls the mean above 4 of the 5 values.



Working

6. What is the range? What does it tell you about consistency between these 5 students?

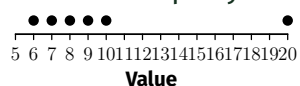
Solution: Range: $20 - 10 = 10$. A fairly small range relative to the scale suggests the 5 students' results were reasonably consistent.



Working

7. By how much does the mean change if the outlier (20) is removed?

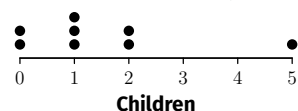
Solution: With outlier: $60 \div 6 = 10$. Without: $40 \div 5 = 8$. The mean drops by $10 - 8 = 2$.



Working

8. A report says "the average family has 1.5 children." Which measure is 1.5? What are the median and mode?

Solution: 1.5 is the mean. Median: 1 (average of the 4th and 5th sorted values). Mode: 1.



Working