LESSON MAKER PRO

Data Detective

Find what is typical and how much the data vary.

GRADE 7 · 7.D.1

7.D.1 "Interpret and analyze data, creating the most appropriate display, using a variety of tools. Design simple experiments, collect data, and calculate measures of center (mean, median, and mode) and spread (range and interquartile range)..."

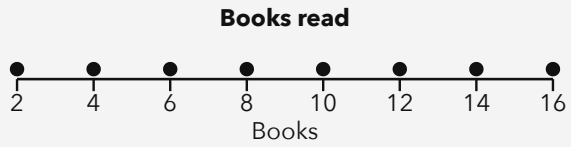
NAME _____ DATE _____

CENTER AND SPREAD

To find the median, order the data and find the middle value, or average the two middle values. To find the interquartile range (IQR), find the median of the lower half (Q1) and the median of the upper half (Q3), then subtract Q1 from Q3. On a box plot, Q1 and Q3 are the left and right edges of the box.

WORKED EXAMPLE

Use the dot plot to find the median and IQR.

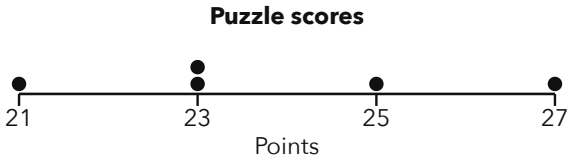


1. The values are already in order.
2. Median = (8 + 10) / 2 = 9.
3. Q1 = (4 + 6) / 2 = 5, and Q3 = (12 + 14) / 2 = 13.
4. IQR = 13 - 5 = 8.

Answer: Median: 9 books; IQR: 8 books

PRACTICE 6 problems

1 Use the dot plot to find the mode and range.



ANSWER _____

2 Find the mean of these five scores: 30, 32, 34, 36, 38.

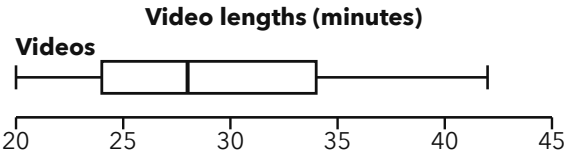
ANSWER _____

3 Use the dot plot to find the IQR.



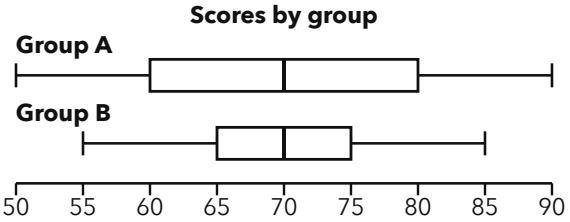
ANSWER _____

4 Use the box plot to find the median and IQR.



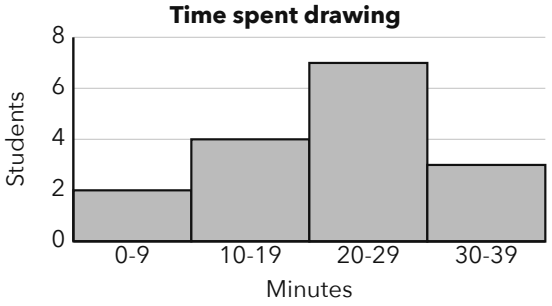
ANSWER _____

5 Which group has the smaller IQR? How much smaller is it?



ANSWER _____

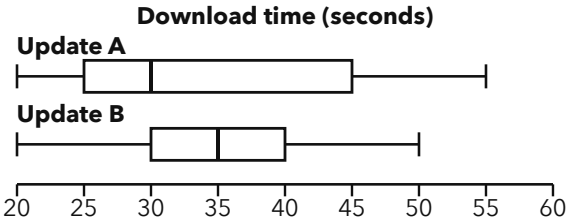
6 Which interval contains the median time?



ANSWER _____

APPLY IT Show your work

1 Two game updates were tested on groups of players. The box plots show download times in seconds. Which update has the lower median time? Which has the smaller IQR? Give both values.



ANSWER _____

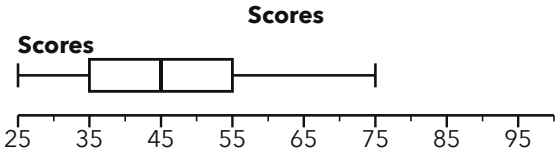
2 For seven days, Sam recorded the minutes spent listening to a playlist: 32, 34, 36, 38, 40, 42, 72. Find the mean and median. Which better describes a typical day, and why?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A box plot shows a set of scores. If only the greatest score increases by 20 points, what are the new range and IQR? Explain why one measure changes and the other does not.



WORK SPACE AND ANSWER

ANSWER KEY

Data Detective

GRADE 7 · 7.D.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the dot plot to find the mode and range.	**Mode: 23 points; range: 6 points**
2	Find the mean of these five scores: 30, 32, 34, 36, 38.	**34**
3	Use the dot plot to find the IQR.	**13 minutes**
4	Use the box plot to find the median and IQR.	**Median: 28 minutes; IQR: 10 minutes**
5	Which group has the smaller IQR? How much smaller is it?	**Group B; its IQR is 10 points smaller.**
6	Which interval contains the median time?	**20-29 minutes**

PART 2 · APPLY IT

1. **Update A has the lower median, 30 seconds. Update B has the smaller IQR, 10 seconds.** Compare the lines inside the boxes for the medians. Subtract each box's left edge from its right edge to get IQRs of 20 seconds for A and 10 seconds for B.
2. **Mean: 42 minutes; median: 38 minutes. The median better describes a typical day because the unusually long 72-minute day raises the mean.** The times total 294 minutes, so the mean is 294 / 7 = 42 minutes. The fourth value is 38, the median.

CHALLENGE

The new range is 70 points because the greatest score becomes 95 and 95 - 25 = 70. The IQR stays 20 points because Q1 and Q3 remain 35 and 55.

Accept equivalent explanations that identify the unusually long day as the reason the mean is higher. In the challenge, changing only the greatest score does not change the order or values of the other scores.