LESSON MAKER PRO

Compare the Clusters

Use medians and box plots to compare two groups.

GRADE 7 · 7.DS.B.3

7.DS.B.3 "Compare two numerical data distributions using visual displays and numerical measures to draw inferences about differences between populations. Use histograms and other visualizations to describe similarities and differences in the range..."

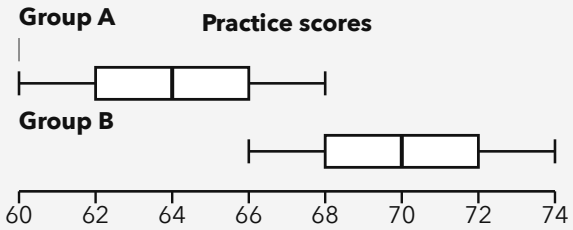
NAME _____ DATE _____

COMPARE CENTER AND SPREAD

On a box plot, the line inside the box marks the median. The box runs from Q1 to Q3, and its length is the IQR. Compare the median gap with the IQRs and look at how much the boxes overlap.

WORKED EXAMPLE

Use the box plots. Find the median gap and each IQR. Is the gap larger than either IQR?



1. Median gap: 70 - 64 = 6 points.
2. Group A IQR: 66 - 62 = 4 points.
3. Group B IQR: 72 - 68 = 4 points. The gap of 6 is larger than 4.

Answer: The median gap is 6 points, larger than either group's 4-point IQR.

PRACTICE 4 problems

1 Group A has a median of 4. Group B has a median of 9. What is the median gap?

ANSWER _____

2 Group A has Q1 = 1 and Q3 = 13. Group B has Q1 = 4 and Q3 = 10. Find both IQRs.

ANSWER _____

3 Group A has a minimum of 0 and a maximum of 15. Group B has a minimum of 2 and a maximum of 18. Find both ranges.

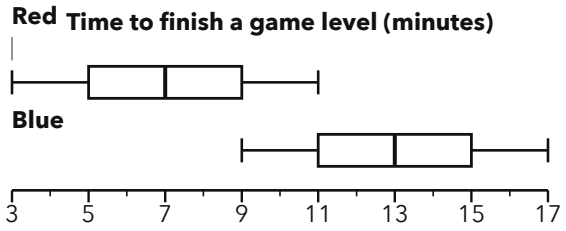
ANSWER _____

4 Group A has Q1 = 3, median = 8, and Q3 = 17. Group B has Q1 = 5, median = 10, and Q3 = 13. Which group has the higher median and smaller IQR?

ANSWER _____

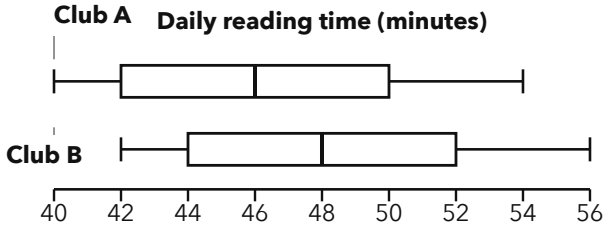
APPLY IT Show your work

1 Two teams timed how long players took to finish a game level. How much faster is Red's median time? Do the middle halves overlap?



ANSWER _____

2 Two book clubs tracked reading minutes per day. Which club has the higher median? Is the gap large compared with each IQR?



ANSWER _____

CHALLENGE One step up

Group A has a minimum of 0, Q1 = 4, median = 6, Q3 = 8, and maximum = 18. Group B has a minimum of 2, Q1 = 5, median = 7, Q3 = 9, and maximum = 11. A student says A's middle half must be more spread out because A's range is larger. Is the student right? Explain with both IQRs.

WORK SPACE AND ANSWER

ANSWER KEY

Compare the Clusters

GRADE 7 · 7.DS.B.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Group A has a median of 4. Group B has a median of 9. What is the median gap?	**5**
2	Group A has Q1 = 1 and Q3 = 13. Group B has Q1 = 4 and Q3 = 10. Find both IQRs.	**Group A: 12; Group B: 6.**
3	Group A has a minimum of 0 and a maximum of 15. Group B has a minimum of 2 and a maximum of 18. Find both ranges.	**Group A: 15; Group B: 16.**
4	Group A has Q1 = 3, median = 8, and Q3 = 17. Group B has Q1 = 5, median = 10, and Q3 = 13. Which group has the higher median and smaller IQR?	**Group B has both. Its median is 10, and its IQR is 8, compared with Group A's median of 8 and IQR of 14.**

PART 2 · APPLY IT

1. **Red's median time is 6 minutes faster. The middle halves, 5 to 9 minutes and 11 to 15 minutes, do not overlap.** Subtract the medians: 13 - 7 = 6. Compare the intervals from Q1 to Q3.
2. **Club B has the higher median, by 2 minutes. The gap is small compared with each club's 8-minute IQR.** Subtract the medians: 48 - 46 = 2. Each box is 8 minutes wide, and the boxes overlap from 44 to 50 minutes.

CHALLENGE

No. A's range is 18 and B's is 9, but both IQRs are 4. Their middle halves have the same spread.

Accept a median gap stated without direction when the question asks only for the gap. For the challenge, accept any explanation that distinguishes the larger range from the equal IQRs.