LESSON MAKER PRO

Compare the Samples

Use medians and IQRs to compare groups.

GRADE 7 · 7.SP.4

7.SP.4 "Use measures of center and measures of variability (i.e., inter-quartile range) for numerical data from random samples to draw informal comparative inferences about two populations. For example..."

NAME _____ DATE _____

CENTER AND SPREAD

In a sorted list with seven values, the median is the middle value. Q1 is the middle of the three values below it, and Q3 is the middle of the three values above it. IQR = Q3 - Q1; compare sample medians and IQRs to make a cautious claim about the larger groups.

WORKED EXAMPLE

Random samples show minutes spent practicing music. Which group seems to practice longer? Compare the IQRs, too.

MUSIC PRACTICE MINUTES

Group	Sorted sample
A	20, 22, 24, 26, 28, 30, 32
B	34, 36, 38, 40, 42, 44, 46

1. The medians are 26 for A and 40 for B.
2. For A, Q1 = 22 and Q3 = 30. For B, Q1 = 36 and Q3 = 44.
3. Both IQRs are 8 because 30 - 22 = 8 and 44 - 36 = 8.

Answer: Group B seems to practice longer. Both samples have an IQR of 8 minutes.

PRACTICE 4 problems

1 Find the median and IQR: 2, 3, 4, 5, 7, 8, 9.

ANSWER _____

2 Find the median and IQR: 4, 6, 6, 8, 10, 12, 12.

ANSWER _____

3 A: 2, 4, 5, 6, 7, 9, 10. B: 3, 5, 6, 8, 9, 11, 13. Which sample has the higher median, and by how much?

ANSWER _____

_____

4 A: 1, 3, 4, 5, 6, 7, 9. B: 2, 3, 5, 6, 8, 11, 14. Which sample has the greater IQR, and by how much?

ANSWER _____

_____

APPLY IT Show your work

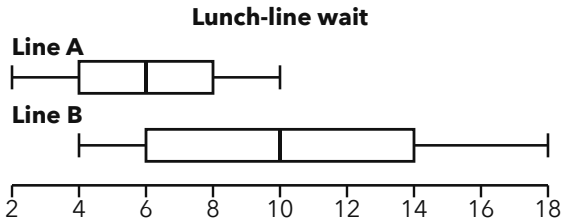
1 Students at two schools were randomly sampled about weekly hours spent playing games. Which school's students seem to play longer? Compare the medians and IQRs.

WEEKLY GAMING HOURS

School	Sorted sample
A	2, 3, 4, 5, 6, 7, 8
B	4, 5, 7, 8, 9, 10, 12

ANSWER _____

2 The box plots show minutes spent in two lunch lines on randomly chosen days. Which line seems faster on a typical day? Compare the medians and IQRs. In each box, the middle line marks the median, and the ends mark Q1 and Q3.



ANSWER _____

CHALLENGE One step up

Random samples of daily exercise minutes are East: 2, 4, 5, 6, 7, 8, 18 and West: 5, 6, 7, 8, 9, 10, 11. A student says East's students exercise more because East has the higher maximum. Use the medians and IQRs to explain whether the samples support that claim.

WORK SPACE AND ANSWER

ANSWER KEY

Compare the Samples

GRADE 7 · 7.SP.4

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the median and IQR: 2, 3, 4, 5, 7, 8, 9.	**Median = 5; IQR = 5.**
2	Find the median and IQR: 4, 6, 6, 8, 10, 12, 12.	**Median = 8; IQR = 6.**
3	A: 2, 4, 5, 6, 7, 9, 10. B: 3, 5, 6, 8, 9, 11, 13. Which sample has the higher median, and by how much?	**B, by 2.**
4	A: 1, 3, 4, 5, 6, 7, 9. B: 2, 3, 5, 6, 8, 11, 14. Which sample has the greater IQR, and by how much?	**B, by 4.**

PART 2 · APPLY IT

1. **School B's students seem to play longer. The medians are 8 hours for B and 5 hours for A; the IQRs are 5 hours for B and 4 hours for A.** Use the fourth value for each median. Subtract Q1 from Q3: for A, 7 - 3 = 4; for B, 10 - 5 = 5.
2. **Line A seems faster. Its median wait is 6 minutes, compared with 10 minutes for B. Its IQR is 4 minutes, compared with 8 minutes for B.** Read the medians from the middle lines. Subtract the box ends: 8 - 4 = 4 for A and 14 - 6 = 8 for B.

CHALLENGE

The samples do not support the claim. West has the higher median, 8 minutes compared with 6 minutes for East. Both IQRs are 4 minutes. East's higher maximum does not show that its students generally exercise more.

Accept cautious wording such as “seems” or “likely” for population comparisons. Do not accept a claim that a sample proves what is true of every student or day.