LESSON MAKER PRO

Spot the Spread

Compare centers, spreads, and shapes of data.

HIGH SCHOOL · MT.CORE.DATA.INT.5

MT.CORE.DATA.INT.5 "Compare and contrast two or more quantitative data distributions, using shape, center, and spread in context. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities."

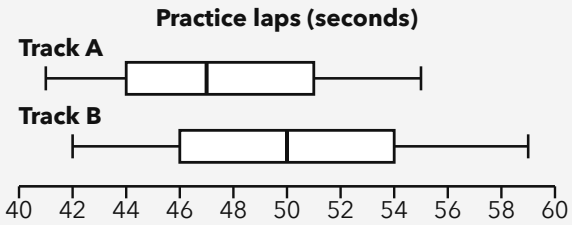
NAME _____ DATE _____

COMPARE THE DISTRIBUTIONS

Use the median to compare centers and the interquartile range (IQR) to compare the middle half. To describe shape, look for a longer tail on either side. For seven ordered values, find Q1 and Q3 by taking the medians of the three values below and above the overall median.

WORKED EXAMPLE

Compare the medians and IQRs of the lap times shown.



1. Read the medians: A is 47 seconds; B is 50 seconds.
2. Find each IQR: A is 51 - 44 = 7 seconds; B is 54 - 46 = 8 seconds.
3. Compare: B has the higher median and the larger IQR.

Answer: Track B has a higher median by 3 seconds and a larger IQR by 1 second.

PRACTICE 4 problems

1 Bus waits (minutes): A: 3, 4, 5, 6, 7; B: 2, 3, 5, 7, 9. Compare the medians and ranges.

ANSWER _____

2 Quiz scores: A: 1, 2, 3, 4, 10; B: 1, 7, 8, 9, 10. Which has a longer right tail? Give both medians.

ANSWER _____

3 Commute times (minutes): A: 6, 6, 6, 6, 16; B: 7, 8, 9, 10, 11. Which has a higher median? Which has a larger range?

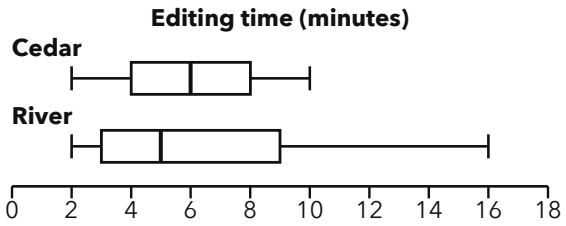
ANSWER _____

4 Waits (minutes): A: 2, 4, 5, 6, 8; B: 1, 4, 5, 6, 12. Compare the medians and ranges.

ANSWER _____

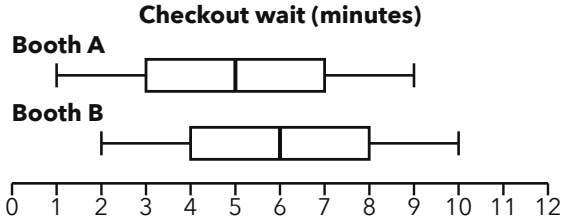
APPLY IT Show your work

1 For a school showcase of interviews with Montana Indigenous artists, two student teams timed their video edits. Compare the teams' medians and IQRs. Which has the longer right tail?



ANSWER _____

2 At a school market featuring work by Montana Indigenous artists, students timed checkout waits at two booths. Compare the medians, IQRs, and shapes.



ANSWER _____

CHALLENGE One step up

Bike commutes (minutes): A: 3, 4, 5, 6, 7, 8, 15; B: 1, 4, 5, 6, 7, 8, 9. Compare the medians and IQRs. Which group has the longer upper tail, and why does IQR miss that difference?

WORK SPACE AND ANSWER

ANSWER KEY # Spot the Spread

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Bus waits (minutes): A: 3, 4, 5, 6, 7; B: 2, 3, 5, 7, 9. Compare the medians and ranges.	**Both medians are 5 minutes. A's range is 4 minutes; B's is 7 minutes.**
2	Quiz scores: A: 1, 2, 3, 4, 10; B: 1, 7, 8, 9, 10. Which has a longer right tail? Give both medians.	**A has a longer right tail. A's median is 3; B's is 8.**
3	Commute times (minutes): A: 6, 6, 6, 6, 16; B: 7, 8, 9, 10, 11. Which has a higher median? Which has a larger range?	**B has the higher median, 9 versus 6 minutes. A has the larger range, 10 versus 4 minutes.**
4	Waits (minutes): A: 2, 4, 5, 6, 8; B: 1, 4, 5, 6, 12. Compare the medians and ranges.	**Both medians are 5 minutes. A's range is 6 minutes; B's is 11 minutes.**

PART 2 · APPLY IT

1. **Cedar's median is 6 minutes and IQR is 4 minutes. River's median is 5 minutes and IQR is 6 minutes. River has the longer right tail.** Subtract Q1 from Q3 for each team. River's upper whisker spans 7 minutes, compared with Cedar's 2 minutes.
2. **Booth B's median is 6 minutes, one minute higher than Booth A's 5 minutes. Both IQRs are 4 minutes, and both box plots are symmetric.** Read each median and subtract Q1 from Q3. In each plot, the median is centered in the box and the whiskers have equal lengths.

CHALLENGE

Both medians are 6 minutes, and both IQRs are 4 minutes. A has the longer upper tail: its maximum is 7 minutes above Q3, while B's is 1 minute above Q3. IQR measures only the middle half, not the extremes.

Accept equivalent comparisons stated in context. For the challenge, accept a comparison of the maximum values as evidence of the upper-tail difference.