LESSON MAKER PRO

Sample Signals

Compare groups using means and ranges

GRADE 7 · MT.7.SP.4

MT.7.SP.4 "Use measures of central tendency and measures of variability for numerical data from random samples to draw comparative inferences about two populations."

NAME _____ DATE _____

THE BIG IDEA

To find a mean, add the values and divide by how many there are. To find a range, subtract the least value from the greatest. Compare both measures to make a cautious claim about the groups the random samples came from.

WORKED EXAMPLE

Random samples show puzzle-solving times for two groups. Compare their means and ranges. What might you infer?

PUZZLE TIME IN MINUTES

Group	Random sample
A	1, 3, 5
B	7, 9, 11

1. A: mean = (1 + 3 + 5)/3 = 3; range = 5 - 1 = 4.
2. B: mean = (7 + 9 + 11)/3 = 9; range = 11 - 7 = 4.
3. B has the higher mean. The ranges are equal.

Answer: Group B may take longer to solve puzzles, with a similar spread in times.

PRACTICE 4 problems

1 Random samples of reading minutes are A: 20, 22, 24 and B: 26, 28, 30. Find both means and ranges. Which group likely reads longer?

ANSWER _____

2 Random samples of laps run are A: 16, 18, 20 and B: 16, 20, 24. Find both means and ranges. Which group varies more?

ANSWER _____

3 Random samples of game scores are A: 30, 32, 34 and B: 32, 34, 36. Find both means and ranges. Which group likely scores higher?

ANSWER _____

_____

4 Random samples of weekly bike miles are A: 20, 24, 28 and B: 22, 24, 26. Find both means and ranges. Which group is more consistent?

ANSWER _____

_____

APPLY IT Show your work

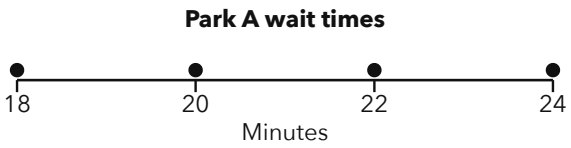
1 Students from two music clubs were randomly sampled about yesterday's practice time. Which club likely practiced longer? Compare means and ranges.

PRACTICE TIME IN MINUTES

Club	Random sample
Band	32, 34, 36, 38
Choir	26, 28, 30, 32

ANSWER _____

2 Random samples show skate-park wait times. Park B's times are 22, 22, 26, 30 minutes. Park A's times are shown. Which park likely has shorter waits? Compare means and ranges.



ANSWER _____

CHALLENGE One step up

Random samples of daily steps, in hundreds, are A: 40, 42, 44, 46 and B: 38, 40, 46, 48. Find both means and ranges. Do these samples suggest that B generally walks more? Explain.

WORK SPACE AND ANSWER

ANSWER KEY

Sample Signals

GRADE 7 · MT.7.SP.4

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Random samples of reading minutes are A: 20, 22, 24 and B: 26, 28, 30. Find both means and ranges. Which group likely reads longer?	**A: mean 22, range 4. B: mean 28, range 4. Group B likely reads longer.**
2	Random samples of laps run are A: 16, 18, 20 and B: 16, 20, 24. Find both means and ranges. Which group varies more?	**A: mean 18, range 4. B: mean 20, range 8. Group B varies more.**
3	Random samples of game scores are A: 30, 32, 34 and B: 32, 34, 36. Find both means and ranges. Which group likely scores higher?	**A: mean 32, range 4. B: mean 34, range 4. Group B likely scores higher.**
4	Random samples of weekly bike miles are A: 20, 24, 28 and B: 22, 24, 26. Find both means and ranges. Which group is more consistent?	**A: mean 24, range 8. B: mean 24, range 4. Group B is more consistent.**

PART 2 · APPLY IT

1. **Band likely practiced longer. Band: mean 35 minutes, range 6 minutes. Choir: mean 29 minutes, range 6 minutes.** Add each club's four times and divide by 4. Subtract the least time from the greatest for each range.
2. **Park A likely has shorter waits. A: mean 21 minutes, range 6 minutes. B: mean 25 minutes, range 8 minutes.** Park A's times total 84 minutes; Park B's total 100 minutes. Divide each total by 4, then subtract each sample's least time from its greatest.

CHALLENGE

A: mean 43 hundreds, range 6 hundreds. B: mean 43 hundreds, range 10 hundreds. No. The means are equal, though B's sample has a greater spread.

Accept equivalent cautious inferences, such as 'the sample suggests' or 'likely.' A smaller range indicates less variation within these samples.