

Comparing Distributions

KS3 Maths · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Bus A's journey times have mean 12 minutes and range 4 minutes. Bus B's have mean 15 minutes and range 10 minutes. Compare them.

Step 1 · Compare the averages, in context

On average, Bus A is quicker (mean 12 min v 15 min)

Step 2 · Compare the spreads, in context

Bus A is more reliable: its times vary less (range 4 min v 10 min)

Answer: Bus A is quicker on average and more reliable

Check: One comparison of average + one of spread, both explained ✓

2. Now try one with the steps

Compare the shoe sizes: Group X: 4, 5, 5, 6, 7. Group Y: 3, 5, 6, 8, 8.

Step 1 · Medians (middle values)

Step 2 · Ranges

Step 3 · Write the comparison

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Which measures spread: the mean or the range? [1]

2. Which value is an outlier in 4, 6, 7, 9, 24? [1]

3. Team A scores a mean of 2.1 goals a match; Team B scores a mean of 1.6. Which team scores more on average? [1]

4. Find the range of 3, 8, 5, 9, 5. [1]

5. Find the median of 3, 8, 5, 9, 5. [1]

6. Which average is affected least by an outlier? [1]

7. Find the mean of 3, 4, 4, 5, 6. [1]

8. The value 30 is added to 3, 4, 4, 5, 6. Find the new mean, to 1 decimal place. [2]

9. Find the median of 3, 4, 4, 5, 6, 30. [1]

10. Set X has median 14 and range 6. Set Y has median 14 and range 15. Compare the two sets. [2]

11. Ali's long jumps are 3.1 m, 3.4 m, 2.9 m and 3.6 m. Find his mean jump in metres. [1]

12. Ben's long jumps are 2.2 m, 4.0 m, 3.9 m and 3.1 m. Find his mean and his range, in metres. [2]

13. Ali's range is 0.7 m and Ben's is 1.8 m. Who would you choose for a competition where every jump counts, and why? [2]

14. A shop says its 'average price is £5' for items costing £1, £1, £2, £2 and £19. Which average did it use, and why is this misleading? [3]

15. Five numbers have a mean of 8 and a range of 6. Every number is increased by 3. What are the new mean and range? [2]

4. Before you hand it in

Comparing two classes by their averages only

A full comparison needs an average AND a measure of spread, such range.

'Group B has a bigger range' with nothing else

Say what it means: 'Group B's scores were more varied, so its results were less consistent.'

Thinking a bigger range means better results

The range tells you how spread out the data is, not whether it is high or low. Use an average to judge which is higher.

Using the mean for house prices that include one mansion

An outlier drags the mean towards it. The median gives a fairer 'typical' value when there are extreme values.