Comparing Data Sets

Use the site's statistics tool or a graphing calculator. Same scale, shape first, the statistics that fit the shape (the same kind for both groups), then sentences in context.

Name _____ Date _____

Words we use

say the math word, then the plain English

WORD	PLAIN ENGLISH	WHAT YOU DO
Compare	Describe how two groups are alike and different: shape, center, spread, in context.	Same scale, shape first, matching statistics.
Consistent	Having little spread.	A smaller IQR or standard deviation.
Same kind of statistic	Use the median and IQR for both groups, or the mean and σ for both.	Otherwise the comparison is unfair.
Population standard deviation, σ	Divide by n: for when the list is the whole group, like a whole class.	A sample would use s.
Sentence frame	___ had a higher median (___ compared with ___), so ___. ___ had a smaller IQR (___ compared with ___), so it was more consistent.	Fill it with the tool's numbers.

Part A Two classes

1st period: 92, 88, 95, 72, 85, 90, 34, 78, 96, 83, 88, 91, 70, 86, 94, 80, 89, 93, 75, 87. 4th period: 84, 79, 88, 82, 90, 76, 85, 81, 87, 83, 78, 86, 80, 89, 84, 82, 77, 85, 83, 81.

	SHAPE	OUTLIERS?	MEAN	MEDIAN	IQR	Σ
1st period						
4th period						

1. Which statistics fit, and why the same kind for both?

2. Fill the frame: ___ had a higher median (___ compared with ___), so a typical ___ was higher. ___ had a smaller IQR (___ compared with ___), so it was more consistent.

3. Why are the means almost the same?

4. Sigma or s? Why?

Part B Delia's fertilizers

Heights in cm after three weeks. A: 12, 13, 13, 14, 15, 15, 16, 16, 17, 18. B: 10, 12, 14, 15, 16, 17, 19, 20, 22, 25. C: 16, 17, 17, 18, 18, 19, 19, 20, 20, 21.

	SHAPE	MEAN	MEDIAN	IQR	Σ
A					
B					
C					

1. Which grows tallest? Which grows most evenly? Which should Delia use? Write your recommendation in two sentences.

Part C Spread in different units

1. Test scores have σ = 3.81 points; seedling heights have σ = 4.36 cm. Can you compare the spreads? What does each σ mean?

Part D The five steps

1. Write the five steps for comparing groups, in order.

Part E Exit ticket

1. Means 83.3 and 83; medians 87.5 and 83; IQRs 12.5 and 5; the first group is skewed with an outlier. Which scored higher? Which was more consistent?

2. Why not just compare the means?

Answer key

Part A. 1st: skewed left, outlier 34, mean 83.3, median 87.5, IQR 12.5, σ 13.47. 4th: roughly symmetric, none, mean 83, median 83, IQR 5, σ 3.81. 1. Median and IQR (1st period is skewed with an outlier); the same kind keeps it fair. 2. 1st period had a higher median (87.5 compared with 83), so a typical 1st period score was higher. 4th period had a smaller IQR (5 compared with 12.5), so it was more consistent. 3. The 34 pulls 1st period's mean down. 4. Sigma: each list is the whole class.

Part B. A: symmetric, 14.9, 15, 3, 1.81. B: symmetric, 17, 16.5, 6, 4.36. C: symmetric, 18.5, 18.5, 3, 1.50. C grows tallest and most evenly; recommend C.

Part C. Yes: each σ is a typical distance from its own mean, in its own units. Scores sit within about 3.81 points of their mean; heights within about 4.36 cm.

Part D. Same scale; shape; statistics that fit (same kind for both); compare centers and spreads; sentences in context.

Part E. 1. The first scored higher (median); the second was more consistent (IQR). 2. The first group's mean was pulled down by the outlier.