

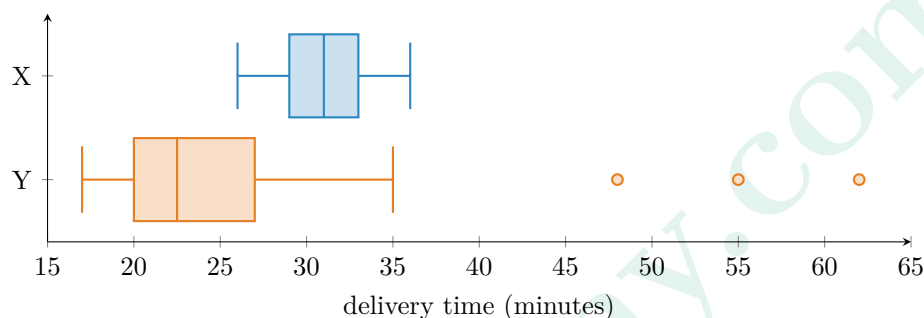
Comparing Distributions

AP Statistics | Unit 1 | same scale, all four features, comparative language

1. Same scale, side by side

To compare groups, draw them on the **same scale**: dotplots or histograms stacked over one number line, back-to-back stemplots, or **parallel boxplots**. Different scales can make two groups look alike, or wildly different, just because of the axes.

Delivery times of two pizza places, 20 orders each (hypothetical data). Averages: X 30.9 min, Y 27.4 min — Y looks faster, but the averages hide the story:



2. Compare all four — with comparative words

Listing values (“X’s median is 31. Y’s median is 22.5.”) earns nothing. Every statement needs a **comparative word** — less than, greater than, more variable than — both groups, and context.

A full comparison

Shape: the delivery times for Y are skewed right, *while* those for X are roughly symmetric.

Outliers: Y has three high outliers (48, 55, 62 min); X has none.

Center: the median delivery time for Y (22.5 min) is *less than* the median for X (31 min).

Spread: Y’s times are *more variable*: its IQR (7 min) is *greater than* X’s (4 min).

Which measures? Skewed data or outliers $\Rightarrow$ compare medians and IQRs. Y’s mean (27.4) sits almost 5 minutes above its median, dragged up by the outliers.

3. Answering the real question

Y is usually faster, but 15% of its orders took more than 40 minutes; X almost always arrives in 26–36 minutes. Which is “better” depends on what matters — speed most of the time, or reliability. Averages alone could not show this.

Where students lose points

1. Listing values instead of comparing them.
2. Comparing only the centers; shape, outliers and spread count too.
3. Drawing the groups on different scales.
4. Comparing means and standard deviations when the data are skewed or have outliers.
5. No context: “Y is bigger” — bigger what? “Y’s delivery times are more variable.”

Remember

- Same scale, side by side: dotplots, histograms, parallel boxplots.
- Compare all four: shape, outliers, center, spread.
- Use comparative words in every sentence, in context.
- Skewed or outliers → compare medians and IQRs.

Now practise it

Theory sticks once you use it. On **sad-academy.com** you’ll find practice questions for this exact subtopic in the AP format, and an AI that grades your free-response answers against the scoring guidelines, the way an AP reader would.

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