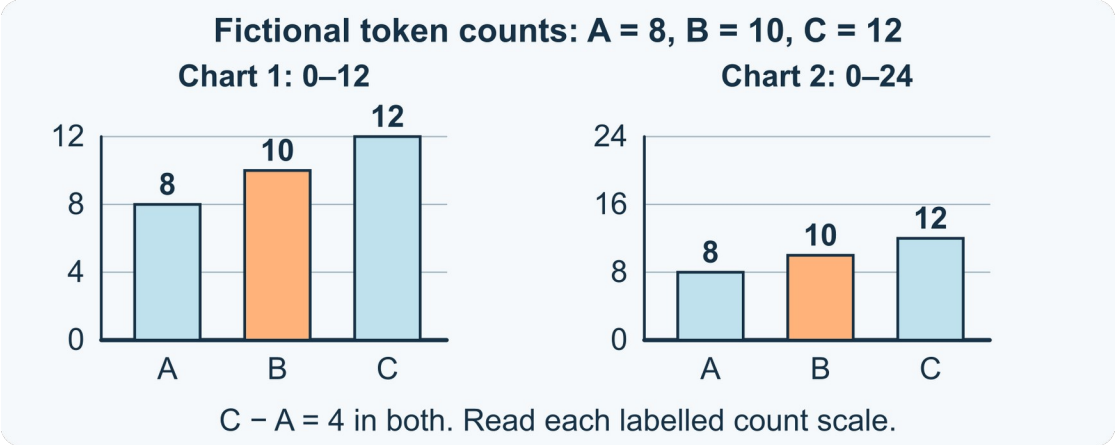
Two charts from the same invented table

Which display choices change an impression without changing the values?

Display the same fictional token counts with two labelled scales, and separate a visual impression from a numerical difference.

Investigate | 15-25 minutes, or one comparison | Paper and a pen or pencil, The supplied invented counts; no survey or spreadsheet needed

Start here Write this fictional table: token type A = 8, B = 10, C = 12. These are invented token counts, not responses from people.



Same counts, two zero-based scales

1 Make the first display

Draw a bar chart with three equal-width bars labelled A, B and C. Use equally spaced marks 0, 4, 8 and 12 on the count axis; all bars begin at zero.

2 Change only the scale range

Draw the same-size plotting area again. Use marks 0, 8, 16 and 24, still equally spaced and starting at zero. Plot the same three counts, keeping labels, bar widths and order unchanged.

3 Read values before impressions

Read each bar against its own scale. C exceeds A by 12 - 8 = 4 tokens in both charts. C is 12 ÷ 8 = 1.5 times A, regardless of the changed display range.

4 Choose and explain

Say which chart makes the values easier to read for your purpose, and why. A bar looks half as tall on the second scale, but its labelled count has not halved. Keep both scales visible.

Invented table 8 10 and 12

This original comparison uses the same fictional data twice. Both count axes begin at zero; neither chart reports a survey.

• Chart 1 ranges from 0 to 12; chart 2 from 0 to 24 in an equally tall plotting area.

• The bars in chart 2 are half the drawn height of the corresponding bars in chart 1. Both still represent A = 8, B = 10, C = 12.

• The total is 30 tokens, and C − A = 4 tokens on either chart.

What this example can show Different scales can change an impression. These diagrams do not establish what every viewer notices, or make an unlabelled or cut-off bar axis acceptable.

A different way

Use the two supplied charts, read the numbers aloud or compare only A and C. No personal data, software or drawing accuracy test is needed.

If you want to go further

Keep one zero-based scale and reverse the category order in a third chart. Explain how order changes the reading sequence while the values and total remain 8, 10, 12 and 30.

Something to notice

Did I read the axis before judging the size of the difference?

Read or explore more

Horizon topic Statistics Data

https://launchhorizonhq.com/learn/statistics-data/

Horizon topic Coordinates Graphs

https://launchhorizonhq.com/learn/coordinates-graphs/

Horizon topic Mathematics

https://launchhorizonhq.com/learn/mathematics/

Office for National Statistics Chart details: Axes and gridlines

https://service-manual.ons.gov.uk/data-visualisation/guidance/axes-and-gridlines

Oak National Academy Securing constructing bar charts by hand

https://www.thenational.academy/teachers/programmes/maths-secondary-ks3/units/graphical-representations-of-data/lessons/securing-constructing-bar-charts-by-hand