STEM Literacy through Infographics

Two-Axis Graph Help!

Part of a Series of Avoiding Graph Pitfalls

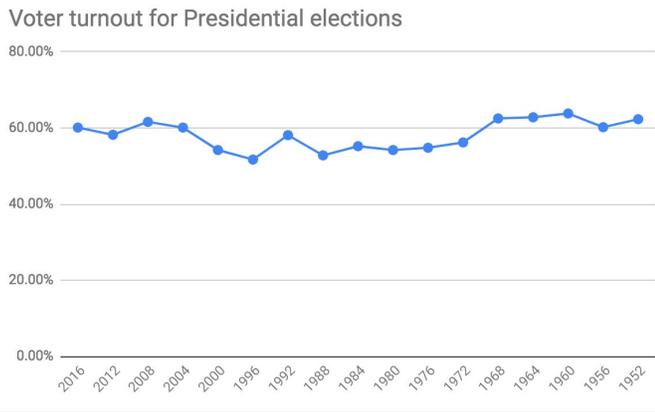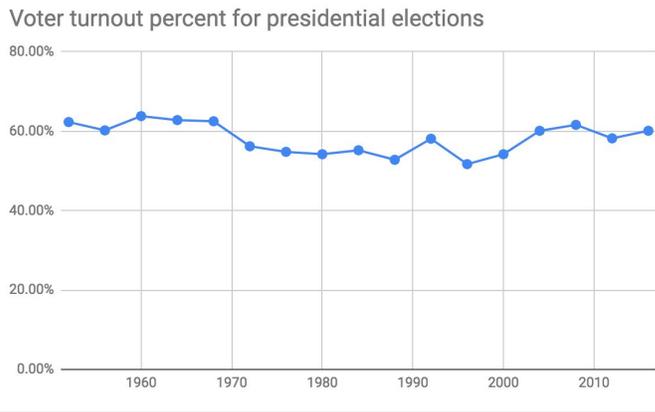*Last updated: January 17, 2019*
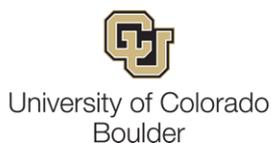
Two-Axis Graph Help!

By Ada Ren & Andee Rubin

If you're reading this, it's probably because you have a line graph or scatter plot that is statistically incorrect or visually misleading. Try to figure out which issue your graph has and consider the suggestions here for improving it.

Problem: X-axis for time reads from right to left

Problem	A Solution
X-axis for time reads backwards from what we expect. Time is typically represented moving from left to right on a graph.	Unless you have a specific reason to want the most recent data on the left, sort your data so that the later dates are on the bottom rows.

Voter turnout for Presidential elections

Voter turnout percent for presidential elections

Problem: Y-axis not labeled appropriately

Problem	A Solution
It's hard to tell what the numbers represent on the Y-axis; They could be seconds, minutes, or hours.	Add an appropriate y-axis label, in this case "minutes."

5k Run time

5k Run time

# Problem: "Best fit" line drawn on a graph inappropriately

Problem	A Solution
Here "best fit" line is drawn on a scatter plot, but the data are scattered far from the line. Add a "best fit" line to a graph only when there is a clear trend that you are trying to illustrate.	If there's no trend, just say so. Remove the trendline. Sometimes that's what the data say.

Number of jumping jacks vs Age
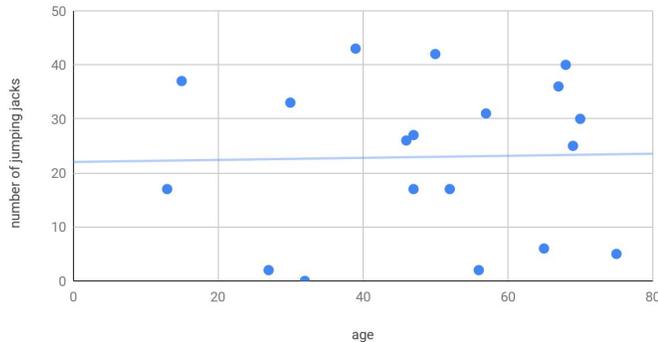
Number of jumping jacks vs. age
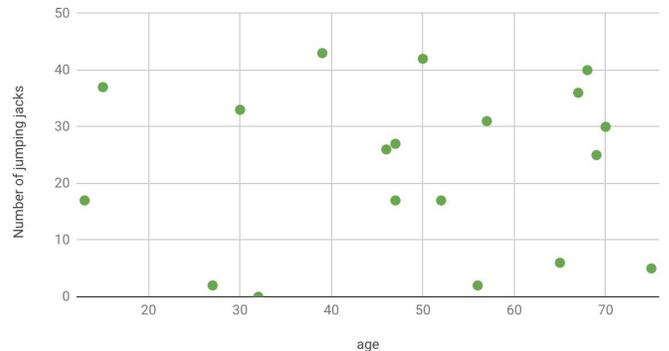
Problem: Points on graph connected by lines inappropriately

Problem	A Solution
Connecting successive points on a graph implies that there could be points on the drawn line, but the data may not support that implication. The graph below implies that a high school student who weighs 150 pounds is likely to be 160 cm tall, but there is no data point there to support it.	Create a graph with the individual points on it, but don't connect them with a line.

High Schoolers' weight vs height
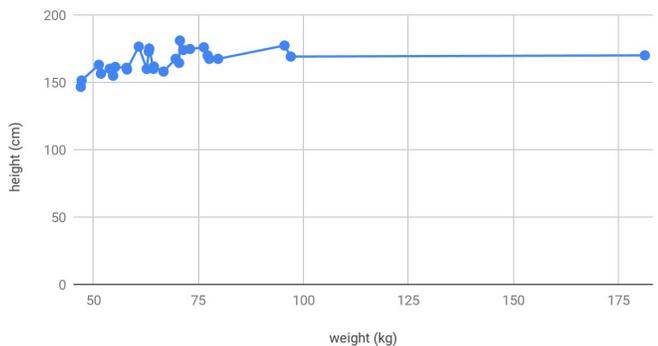
High Schoolers' weight vs height

Problem: Two variables graphed on the same line plot have different units.

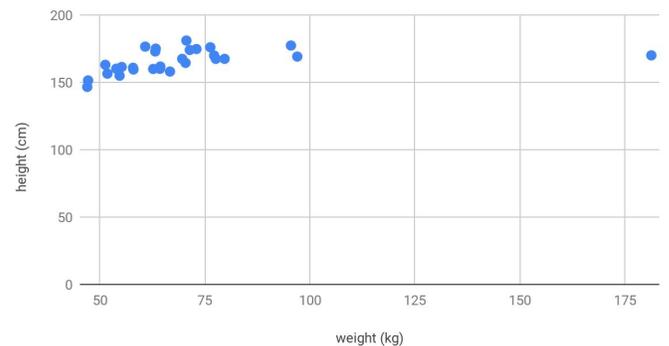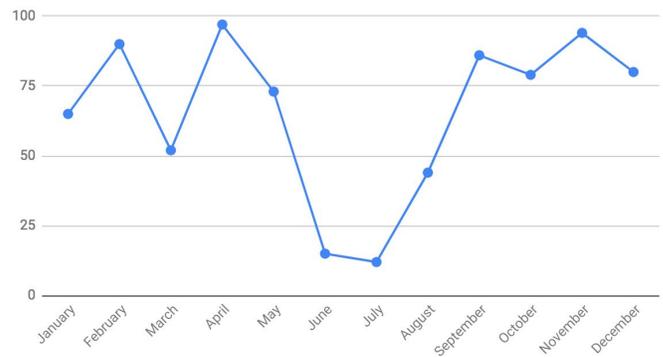| Problem	A Solution
Two variables are graphed on the same axis, but have different units, so the graph implies the values are "the same" when they are not.	Even though both values have the same range, from 0 to 100, they have different units - one is pounds and the other is percents. Add a second Y-axis to make that distinction clear or use two graphs.

Weight of paper recycled (lbs) and % paper recycled

● Weight of paper recycled (lbs)   ● % paper recycled
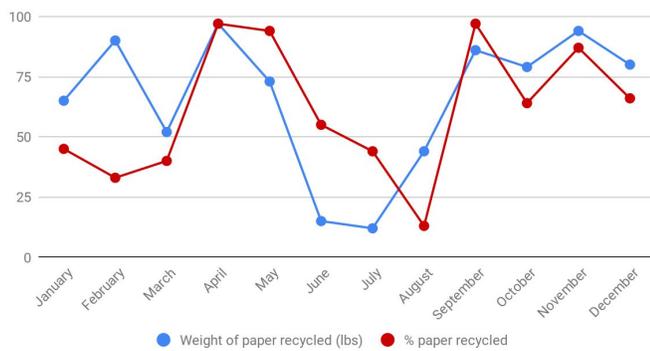
Weight of paper recycled (lbs)

Percent paper recycled