

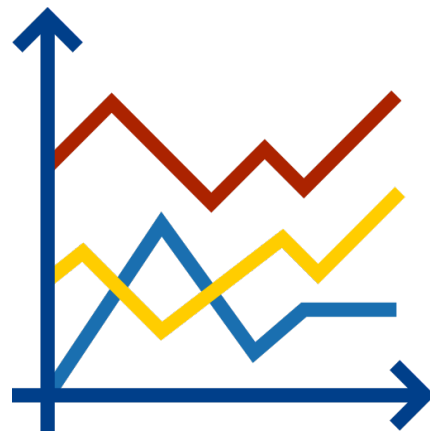
SELECTING AND DESIGNING A DATA VISUALIZATION



BAR CHART

Shows: Comparison
Data: 2 variables -
categorical & numerical

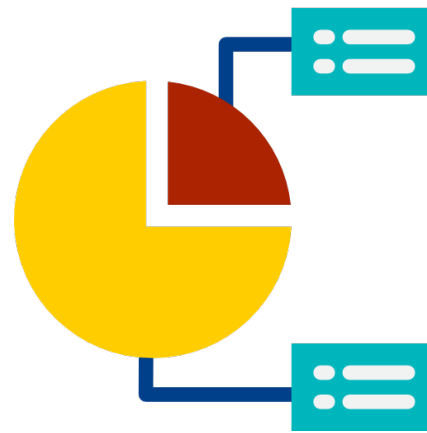
- Always start axis at zero.
- Turn the entire chart horizontal (like above) if categories are too long or there are too many. *Avoid the tilt & squeeze!**
- Bars should be the same color unless it is a clustered or stacked bar chart.
- Arrange by category order. No order? Arrange bars by size.
- To make a clustered or stacked bar chart: add a 3rd variable that is categorical.



LINE CHART

Shows: Trends
Data: 2 variables -
chronological & numerical

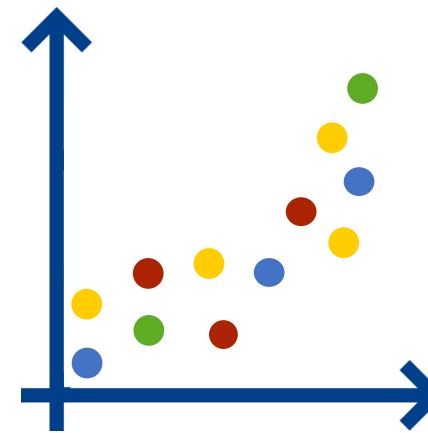
- Line should show a trend across the same sample.
- Axis doesn't have to start at zero, but the line slope should be representative of the trend size.
- To make a chart with multiple lines: add a 3rd variable that is categorical.
- Lines should be solid and easily distinguishable.
- Label lines directly instead of providing a key/legend.
- Avoid more than 4 lines in one chart.



PIE CHART

Shows: Percent to whole
Data: 2 variables -
categorical & percentage

- *Avoid using pie charts at all. If a pie is absolutely needed:
 - All slices must add up to 100% of a variable.
 - Use for only 2-4 slices and when slices have very different sizes.
 - Slices should start at the top and go clockwise largest to smallest, unless there are only two slices.
 - Slices can be different colors, but should be directly labeled and percentages provided.



SCATTER PLOT

Shows: Relationship
Data: 2 variables -
numerical & numerical

- *Great for 1st look at the data.
 - All dots should be the same color, unless you add another variable that is categorical. Then you would distinguish categories by colors.
 - Can also add another variable (ordinal or numerical) that is distinguished by dot size.



Icons adapted from images by [strip](https://flaticon.com) from flaticon.com

* *the tilt* = rotating any text, causing the viewer to tilt their head
the squeeze = trying to fit too many things in a constricted width

FOR ALL VIZZES

Only use a new type of visualization when there is a strong data-related purpose!

- **Be direct:** Directly label data and categories instead of using a legend.
- **Reduce clutter:** Avoid or minimize extra details, like gridlines, axes & tick marks.
- **Use Gestalt principles:** Use bright color to point something out and greys to push important, but supporting information to the back.
- **Make your point clear:** Use size, color, and borders to draw attention to a subsection of your visualization.
- **Be consistent** with sizes, fonts, and colors.
- **Align meaning:** Use colors that either align with the message and the variables being represented.
- **Be accessible:** Make sure of good contrast & large font. Avoid italics.

There are lots of other charts to choose from, such as area charts, treemaps, butterfly charts, bubble charts, and more! But, it is best to learn the 4 basic charts on the left before determining when to switch to another type.

