

1. In your own words, explain three principles of effective data communication from the lecture material.
 - a. Clear
 - b. Easy to understand
 - c. Tells a story
2. In your own words, summarize the following concepts as they relate to visual perception:
 - Order - Expect letters and words to be in a particular order. When they aren't it's far more difficult to read.
 - Hierarchy - Utilization of colors to draw audience attention to the story you're trying to tell with the graph.
 - Relationships - If you present something there should be a relationship or your audience will infer one. The relationship should be clear to the audience.
 - Convention - Should look to conform to convention not resist it.

How will an understanding of these concepts help you create better data visualizations?

- It will allow me to create graphs that the audience can easily interpret as visual images.

3. Given the scenarios below, write which graph would be best to use for the data and what makes it an effective choice:

- Comparison between values - Bar Chart - easiest to read and understand
- Comparison to the whole - Stacked column - easy to read and allows audience to see the comparison clearly
- Change over time - Line - Simple and easy to read.
- Ranking data - Bar chart - Simple and readable.
- Correlation - Scatter Plot - Common convention and again easy to read.
- Geographical charts - Not highly recommended. They are flashy though.
- Measuring a target - Simple Gauge - Simple and elegant.
- Showing Outliers - Table - Good for looking at large amounts of data. Line graphs would be difficult to read.

How will an understanding of these concepts help you create better data visualizations?

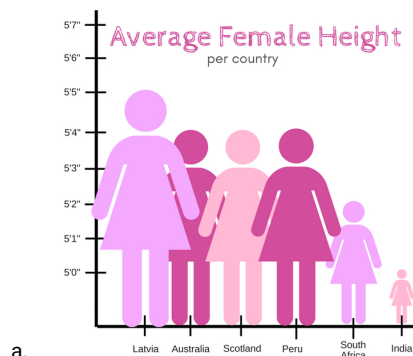
- Having the right tool for the job is always a key to success.

4. Consider the following quote:

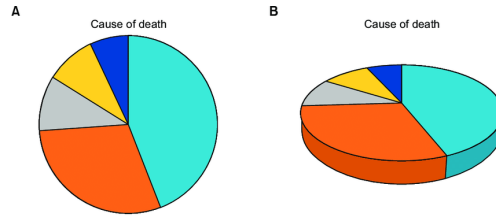
"It is easy to lie with statistics. It is hard to tell the truth without it." - Andrejs Dunkels

What do you think is meant by this statement? - It is easy to distort the truth either purposefully or through poor design. At the same time, statistics is necessary in decision making.

Provide three examples of misleading graphs. Explain what is misleading about the graph in your example and what should be changed to make the graph objective and accurate. Feel free to consult Google for real-life examples of misleading graphs to use as your examples.



- i. The scale of the image makes it confusing. India is only 2" shorter than South Africa but appears to be half the size in the image.



- b. i. Never use a pie chart! Also, making it 3D makes B look almost equivalent to A when in the first image we can clearly tell it's probably only about 55% of A.



- c. i. Makes it look like home prices have tripled in one year when really they only went up \$2K. This is because they truncated the Y axis.

5. In your own words, answer the following questions:

- What is "visualization clutter?" - anything that distracts from the key message of the visualization.
- What are the main components of a graph? - Lines, labels, titles, axis names, & others.
- What are three techniques you learned to make data visualizations more clear? -
 - A. If it doesn't add clarity, remove it.
 - B. Start with a graph and then clear clutter that isn't needed.
 - C. Reintroduce elements you already disregarded.
- How can the use of color affect the way your visualizations are understood? - It can be used to add another dimension to the visualization. Can also be used to create a hierarchy to allow for easy understanding and highlighting importance.