Data Visualizations Presentation

RESET Lesson Plan 2022

Video: How to spot a misleading graph



Link to Video: https://ed.ted.com/lessons/how-to-spot-a-misleading-graph-lea-gaslowitz

Video Reflection and Discussion
(Multiple Prompt Options)

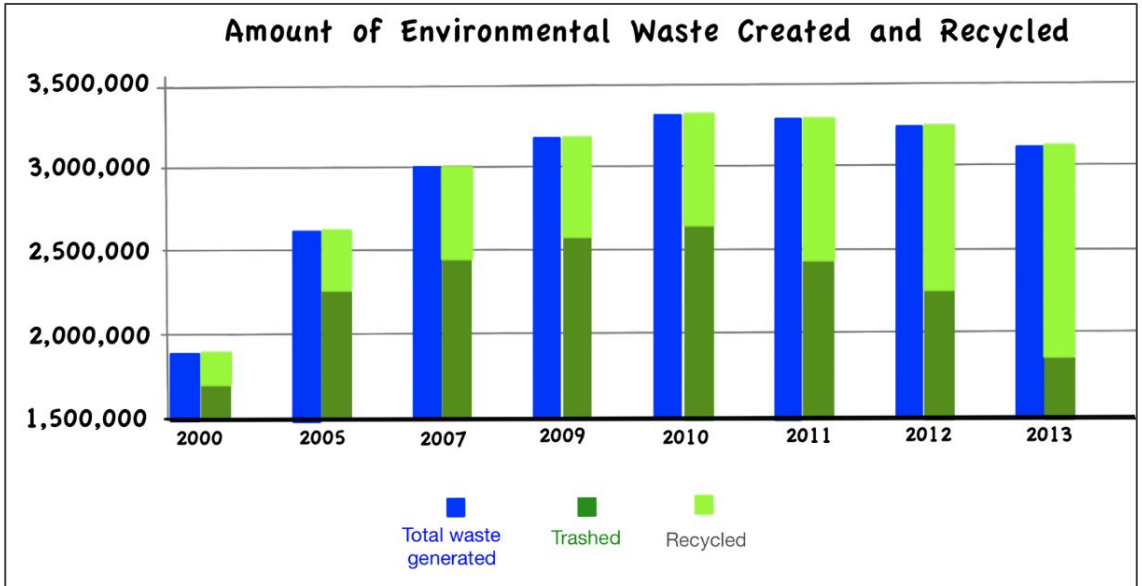
Reflect on the following prompts and discuss:

- Distorting the scale on a graph is one of the most common methods of presenting misleading information. Share another common method where data may be presented in a misleading way.
- List three methods of “cherry picking data” and the advantages each provides.
- Why are graphs commonly used to present claims?
- What is the best way to protect yourself against misleading graphs?
- Why might a person trying to persuade you toward their point of view use a graph to present information?
- Should misleading graphs be put in the same category as “fake news"? What is your opinion? Why is it essential that people be wary of this and seek out reliable and relevant sources?

Explore

Now that you have watched the video, apply what you have learned and analyze the graph below to answer the questions.

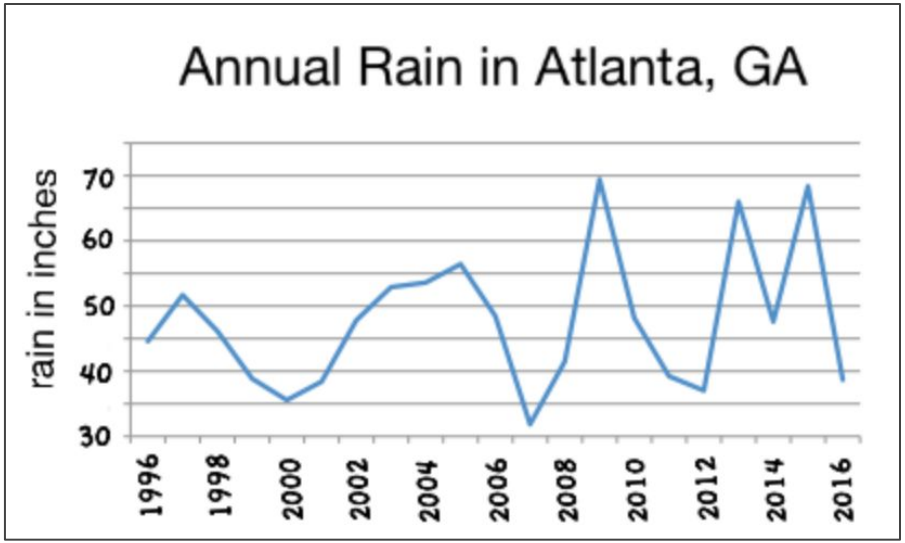
1. Explain at least three problems with this graph.
2. In what year was the amount of waste trashed closest to the amount recycled?

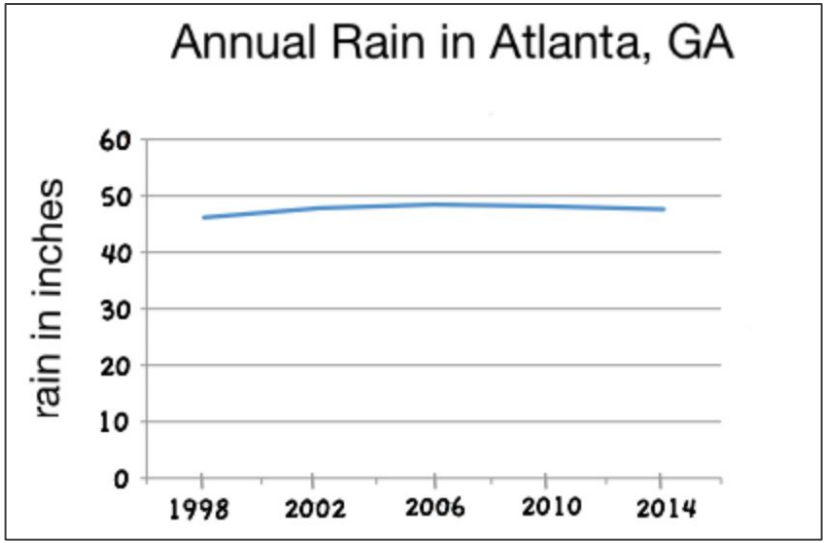


Explore

Apply what you have learned and analyze the graph below to answer the questions.

1. The two graphs above show very different pictures of the rainfall in Atlanta. Explain how each graph is distorted.
2. What information might help you decide if the variance in amount of rain in Atlanta is unusual?





What is a graph?

A graph is a pictorial representation of data in an organized manner. Graphs are usually formed from various data points, which represent the relationship between two or more things.

- Easy way to present large amounts of information.
- Trends are easier to identify.
    - Trends helps us determine where the graph is “going.”
- Can be more organized than data tables.

Types of Trends in Data

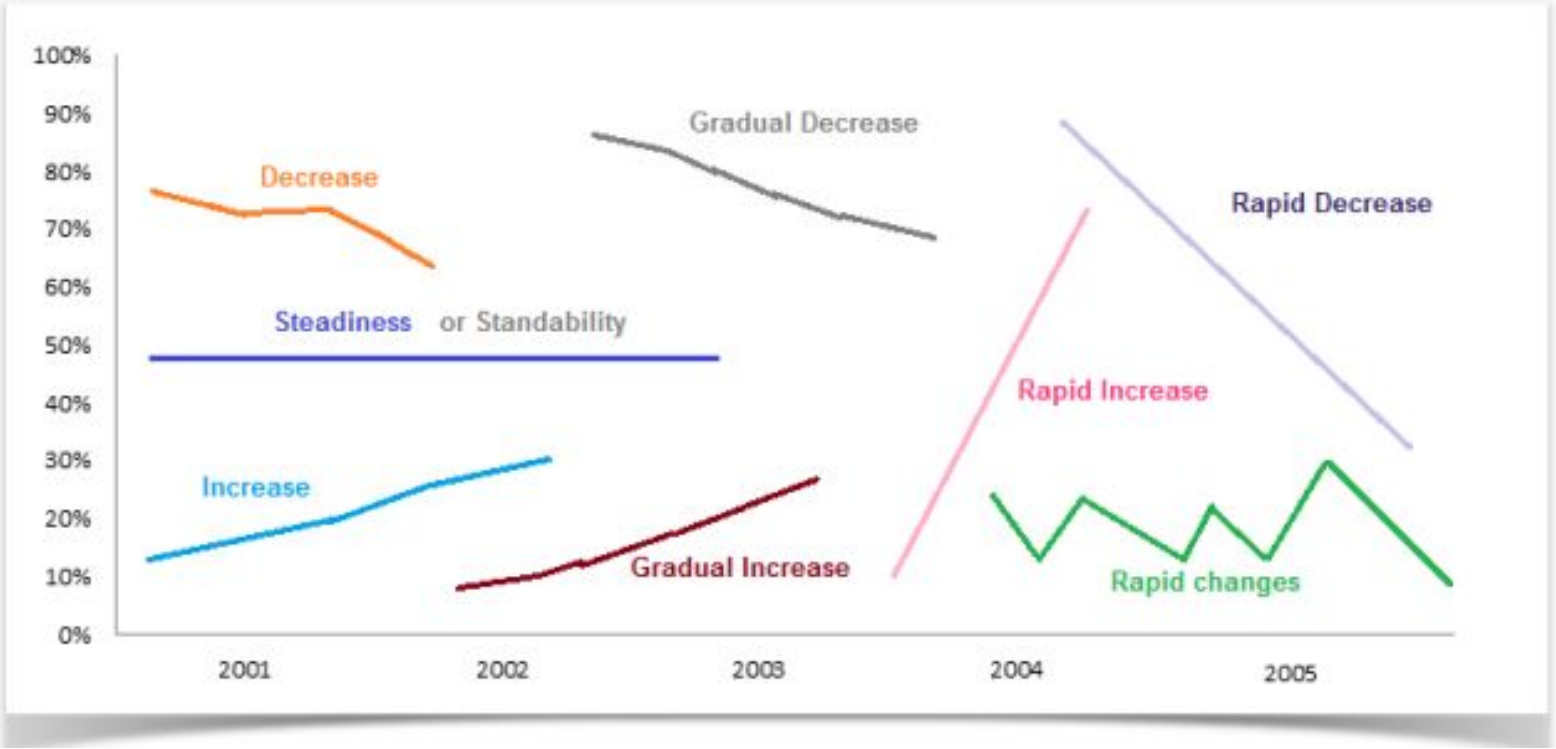


Image Link: https://camiclassroom.files.wordpress.com/2016/01/ielts_vocabulary_for_writing_task_1.png?w=640

Graph vs. Chart

A graph is a mathematical diagram that depicts the relationship between two or more sets of numerical data over a period of time. Basic data is mainly 2-dimensional with a focus on raw data represented through lines, curves, etc.

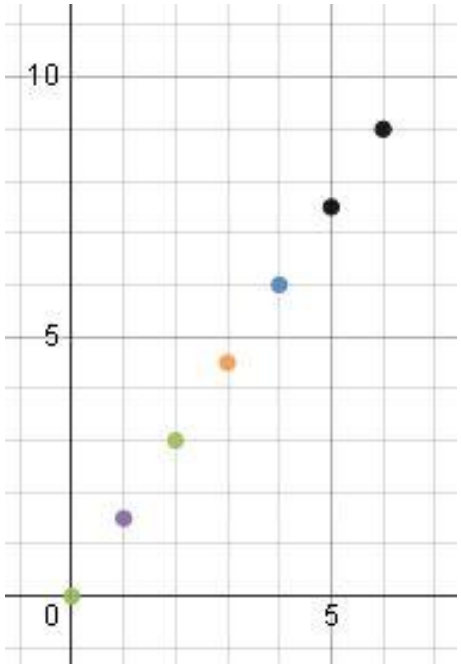
Charts, on the other hand, is a representation of datasets with the intent of making the user understand the information in a better manner. Graphs are a good example of charts used for data visualization.

Which data visualization should you use?



Scatter Plot

A scatter plot is a graph with points on it. These points are not connected via lines or curves, and they will have coordinates. The graph is usually the coordinate plane with an x-axis and a y-axis. For example, the following is a scatter plot:

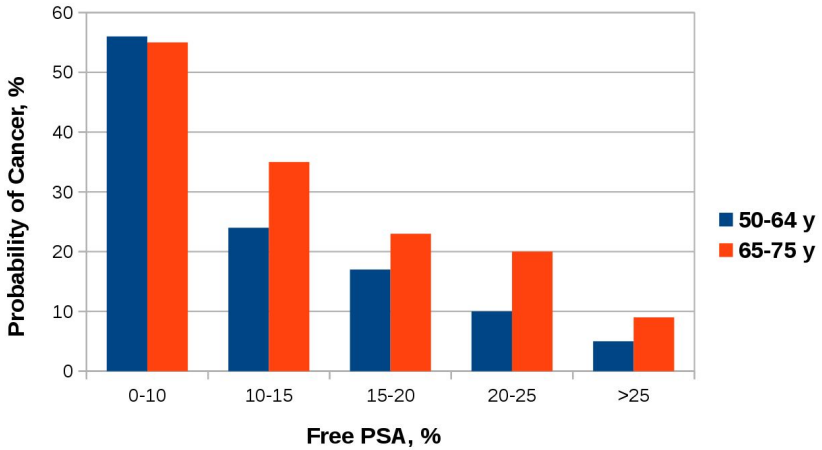


The black horizontal line is the x-axis and the vertical line is the y-axis. Each individual dot on the graph is a data point. Just like with points on the coordinate plane, the points on the scatter plot have the coordinates (x, y), where x is the x-coordinate of the point and y is the y-coordinate of the point. The blue dot located at (4, 6) has an x-coordinate of 4 and a y-coordinate of 6. This means that this point is located where x is equal to 4 and y is equal to 6.

Scatter plots can be used to show a variety of data. Creating a scatter plot is often the first data visualization you will make to represent your data.

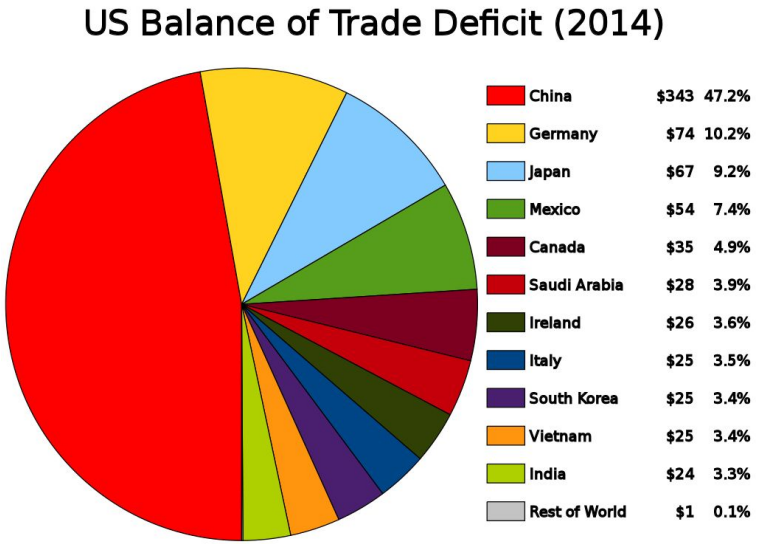
Bar Graph

Bar graphs are an extremely effective visual to use in presentations and reports. They are popular because they allow the reader to recognize patterns or trends far more easily than looking at a table of numerical data.



Pie Chart

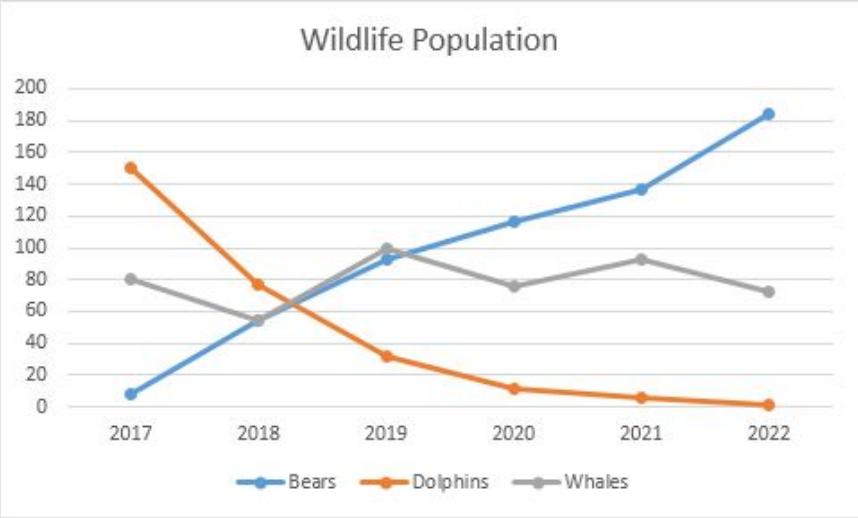
A pie chart (or a circle chart) is a circular statistical graphic, which is divided into slices to illustrate numerical proportion. Pie charts make sense to show a parts-to-whole relationship for categorical or nominal data. The slices in the pie typically represent percentages of the total. With categorical data, the sample is often divided into groups and the responses have a defined order. The percentages in a pie chart should sum to 100%.



Line Graph

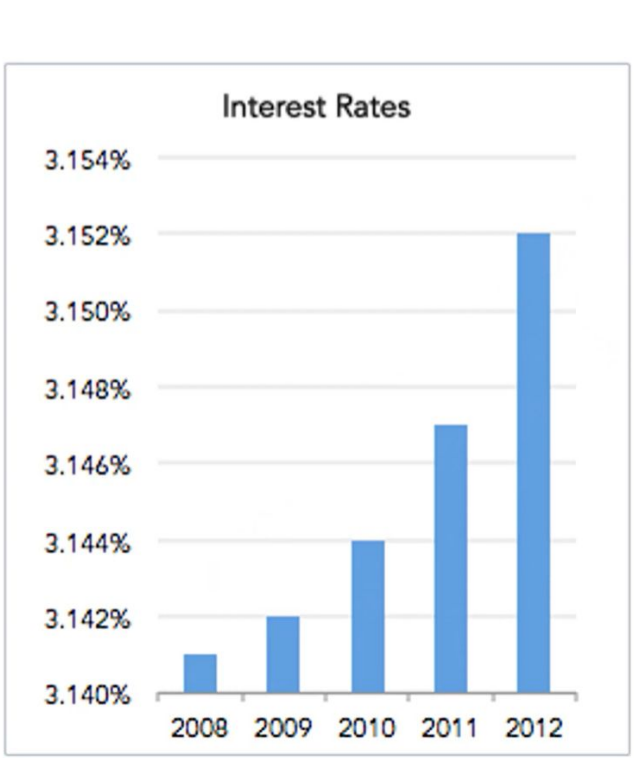
A line graph is a graph that uses lines to connect individual data points. A line graph displays quantitative values over a specified time interval.

Line graphs are used to track changes over short and long periods of time. When smaller changes exist, line graphs are better to use than bar graphs. Line graphs can also be used to compare changes over the same period of time for more than one group.

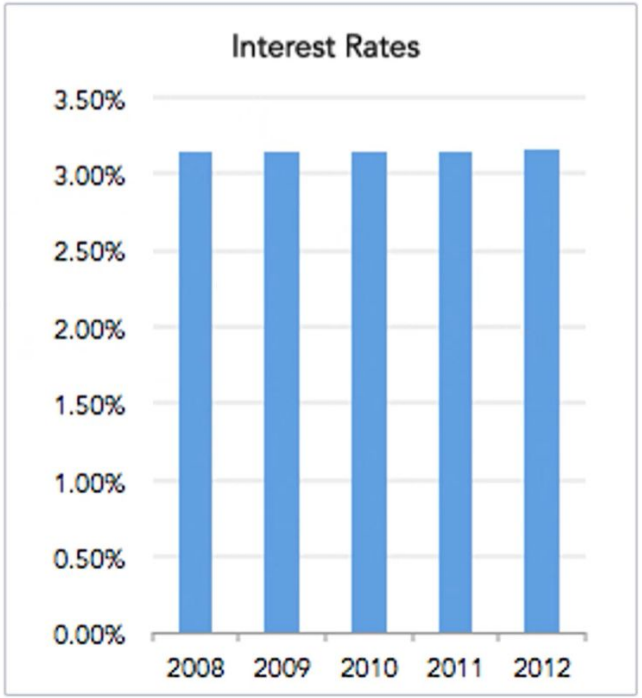


Same Numbers - Different Story

The charts are models of the same dataset. Notice how the scale of the y-axis is different which results in different visualizations.

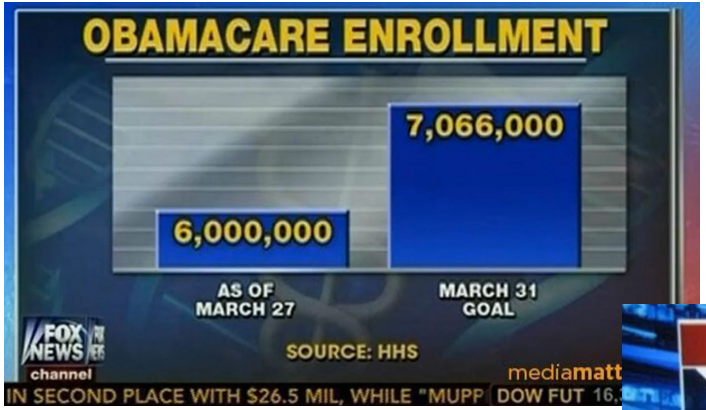


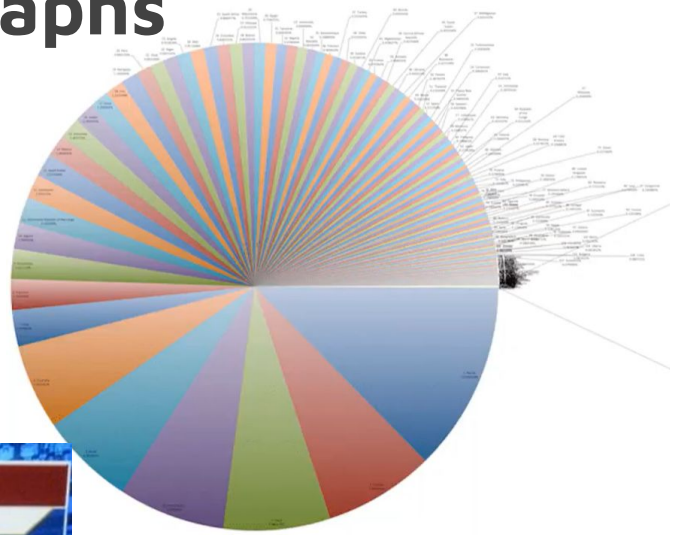
Same Data, Different Y-Axis

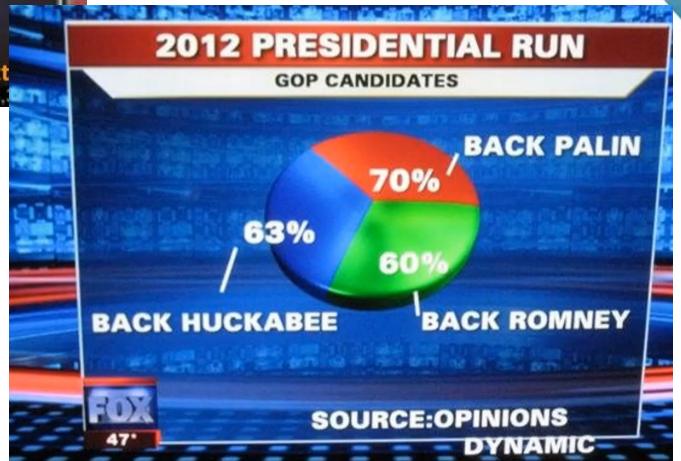


Misleading or Incorrect Graphs

Can you identify the issue with these graphs?







Student Exploration

Now that students understand the basics, they should explore the following website to learn about numerous graphs and charts.

Link: https://piktochart.com/blog/types-of-graphs/

Presentation Sources

- TED Ed Lesson and Questions: https://ed.ted.com/lessons/how-to-spot-a-misleading-graph-lea-gaslowitz#watch