



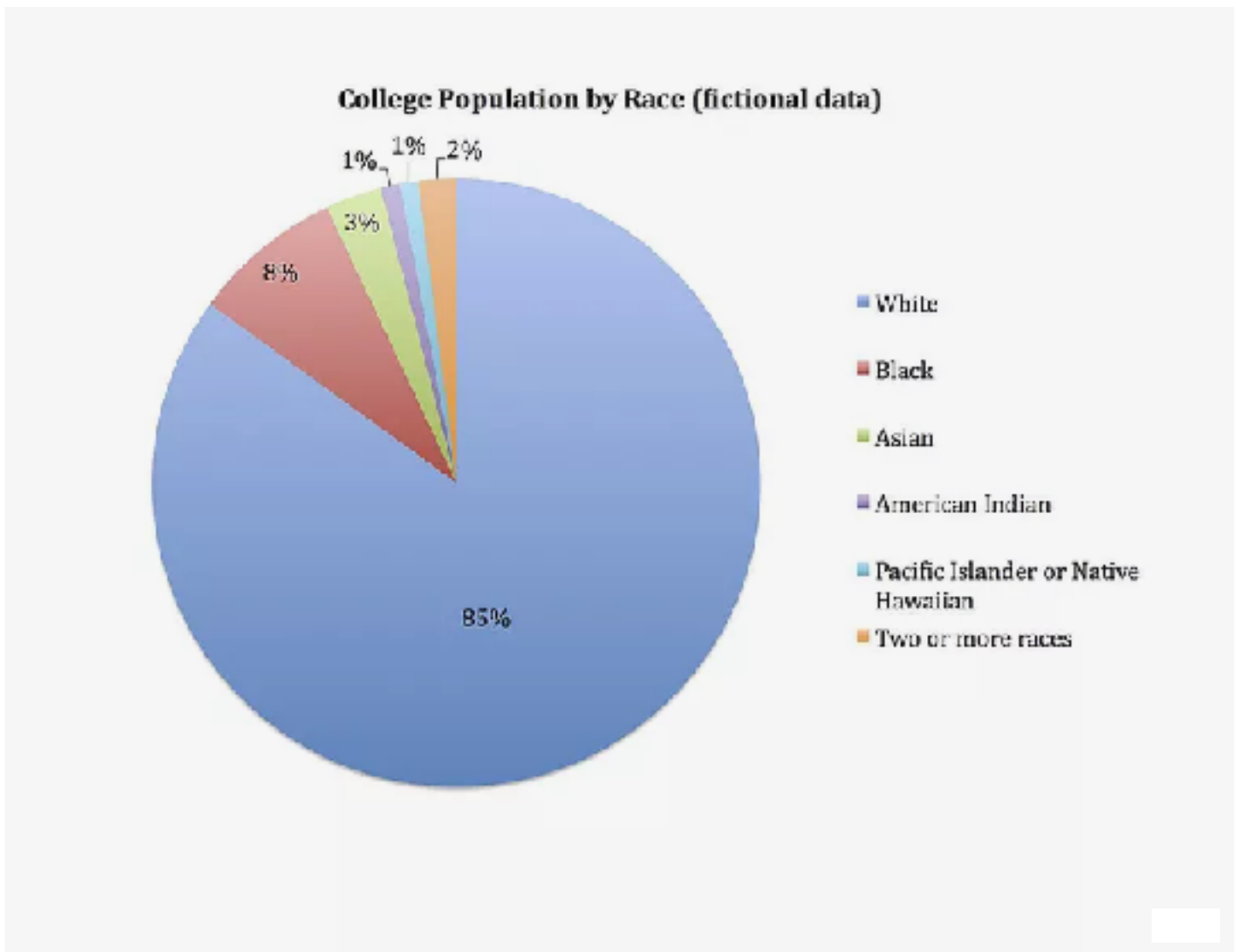
Science, Tech, Math › Math

Presenting Data in Graphic Form

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Example of a pie chart. Ashley Crossman

by Ashley Crossman

Updated May 03, 2018

Many people find frequency tables, crosstabs, and other forms of numerical statistical results

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There are numerous graphing options when it comes to presenting data. Here we will take a look at the most popularly used: [pie charts](#), [bar graphs](#), statistical maps, histograms, and frequency polygons.

Pie Charts

A pie chart is a graph that shows the differences in frequencies or percentages among categories of a [nominal or ordinal](#) variable. The categories are displayed as segments of a circle whose pieces add up to 100 percent of the total frequencies.

Pie charts are a great way to graphically show a frequency distribution. In a pie chart, the frequency or percentage is represented both visually and numerically, so it is typically quick for readers to understand the data and what the researcher is conveying.

Bar Graphs

Like a pie chart, a bar graph is also a way to visually show the differences in frequencies or percentages among categories of a nominal or ordinal variable. In a bar graph, however, the categories are displayed as rectangles of equal width with their height proportional to the frequency or percentage of the category.

Unlike pie charts, bar graphs are very useful for comparing categories of a variable among different groups. For example, we can compare marital status among U.S. adults by gender. This graph would, thus, have two bars for each category of marital status: one for males and one for females. The pie chart does not allow you to include more than one group (i.e. you would have to create two separate pie charts—one for females and one for males).

Statistical Maps

Statistical maps are a way to display the geographic distribution of data. For example, let's say we are studying the geographic distribution of the elderly persons in the United States. A statistical map would be a great way to visually display our data. On our map, each category is represented by a different color or shade and the states are then shaded depending on their classification into the different categories.

In our example of the elderly in the United States, let's say we had 4 categories, each with its own color: Less than 10% (red), 10 to 11.9% (yellow), 12 to 13.9% (blue), and 14% or more (green). If 12.2% of Arizona's population is over 65 years old, Arizona would be shaded blue on our map. Likewise, if Florida's has 15% of its population aged 65 and older, it would be shaded green on the map.

they are exploring.

Histograms

A histogram is used to show the differences in frequencies or percentages among categories of an interval-ratio variable. The categories are displayed as bars, with the width of the bar proportional to the width of the category and the height proportional to the frequency or percentage of that category.

The area that each bar occupies on a histogram tells us the proportion of the population that falls into a given interval. A histogram looks very similar to a bar chart, however, in a histogram, the bars are touching and may not be of equal width. In a bar chart, the space between the bars indicates that the categories are separate.

Whether a researcher creates a bar chart or a histogram depends on the type of data he or she is using. Typically, bar charts are created [with qualitative data](#) (nominal or ordinal variables) while histograms are created [with quantitative data](#) (interval-ratio variables).

Frequency Polygons

A frequency polygon is a graph showing the differences in frequencies or percentages among categories of an interval-ratio variable. Points representing the frequencies of each category are placed above the midpoint of the category and are joined by a straight line.

A frequency polygon is similar to a histogram, however, instead of bars, a point is used to show the frequency and all the points are then connected with a line.

Distortions in Graphs

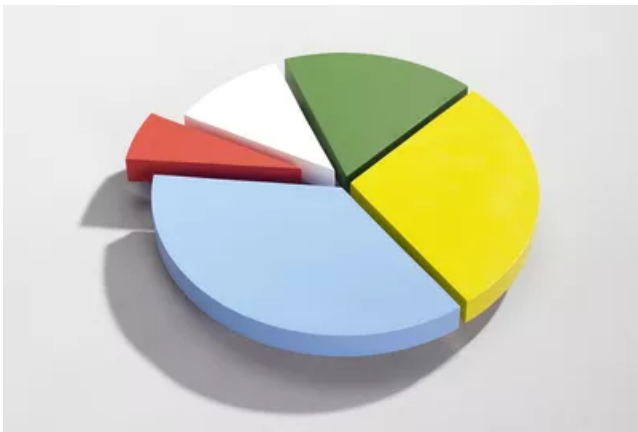
When a graph is distorted, it can quickly deceive the reader into thinking something other than what the data really says. There are several ways that graphs can be distorted.

Probably the most common way that graphs get distorted is when the distance along the vertical or horizontal axis is altered in relation to the other axis. Axes can be stretched or shrunk to create any desired result. For example, if you were to shrink the horizontal axis (X axis), it could make the slope of your line graph appear steeper than it actually is, giving the impression that the results are more dramatic than they are. Likewise, if you expanded the horizontal axis while keeping the vertical axis (Y axis) the same, the [slope of the line graph](#) would be more gradual, making the results appear less significant than they really are.

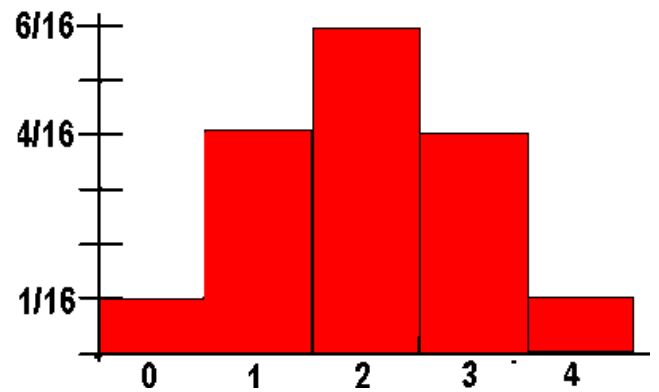
...attention to how the data comes across in the graphs presented accurately and appropriately, so as to not deceive

Frankfort-Nachmias, C. & Leon-Guerrero, A. Social Statistics for a Diverse Society, Pine Forge Press. 2006, Thousand Oaks, CA.

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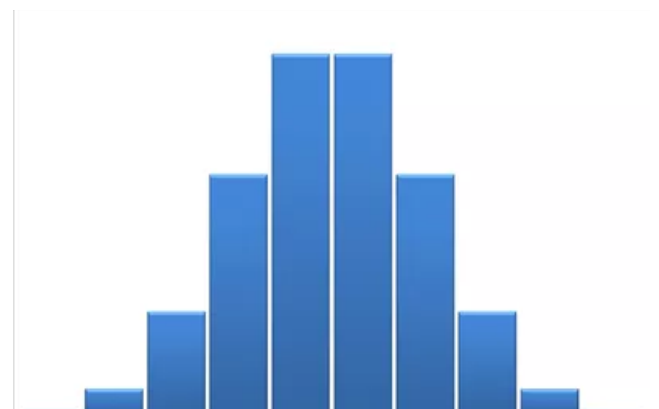
7 Graphs Commonly Used in Statistics



What Is a Histogram and How Is this Graph Used in Statistics?



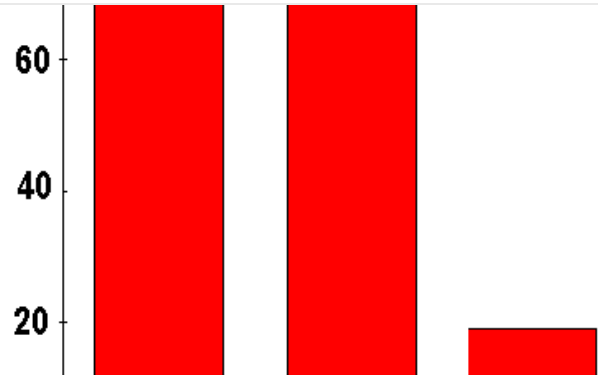
7 Steps to a Third Grade Lesson Plan on Graphing



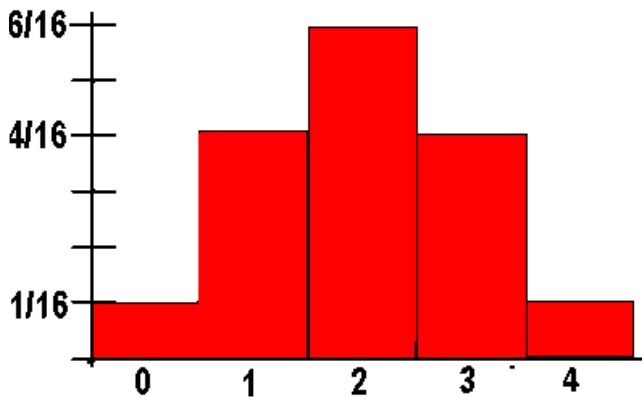
7 Steps to Creating a Histogram



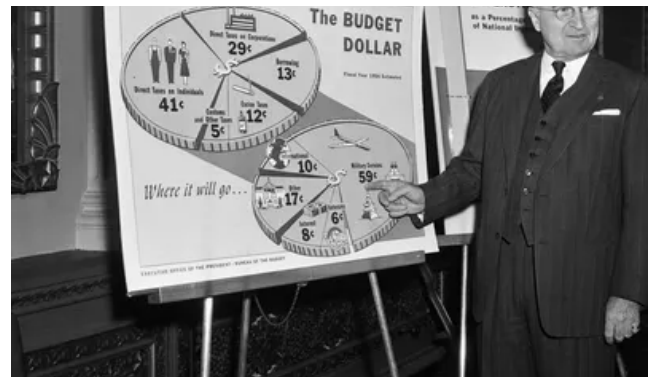
Understand What a Bar Graph Is



Bar Graphs Can Show Data Vertically or Horizontally



What Is a Relative Frequency Histogram?



What Are Pie Charts and Why Are They Useful?



What Is a Two-Way Table of Categorical Variables?



Benefits of the Graphical User Interface



How Does Quantitative Data Correlate to the Study of Statistics?



The Difference Between Descriptive and Inferential Statistics



What Level and Scale of Measurement Should You Use in Research?



How and When to Use a Circle or Pie Graph



How to Discuss Charts and Graphs in English

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