

Analyzing Biological Data

Scientists collect data to find out whether certain factors change or remain the same. Often, the simplest way to do that is to record the data in a table and then make a graph.

The Types of Graphs

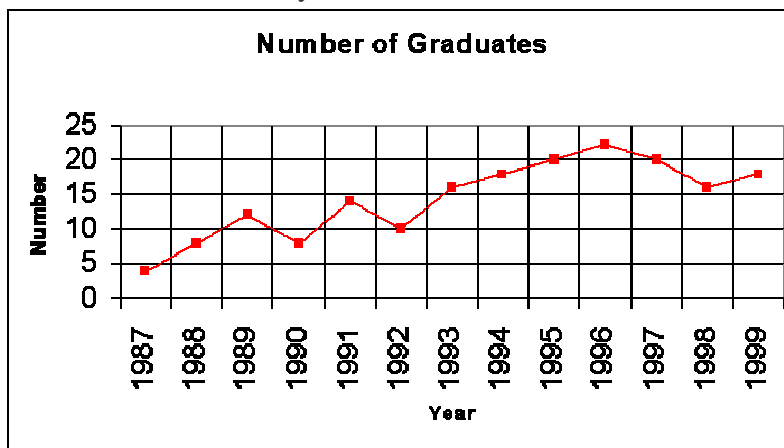
- One of the most useful features of a spreadsheet is its ability to create a wide assortment of charts or graphs.
- It is also relatively easy to copy a graph made with a spreadsheet and paste it into another document such as a letter or report.

There are 3 types of Graphs

- All graphs (except the pie chart or circle graph) use data that is plotted in at least two dimensions.
- The first dimension is horizontal (from left to right) and is commonly referred to as the "x-axis".
- The other dimension is vertical (bottom to top) and is called the "y-axis".
- Sometimes data will be placed in front of other data in a 3D effect. This is referred to as the "z-axis". We will really only discuss x and y axis graphs.

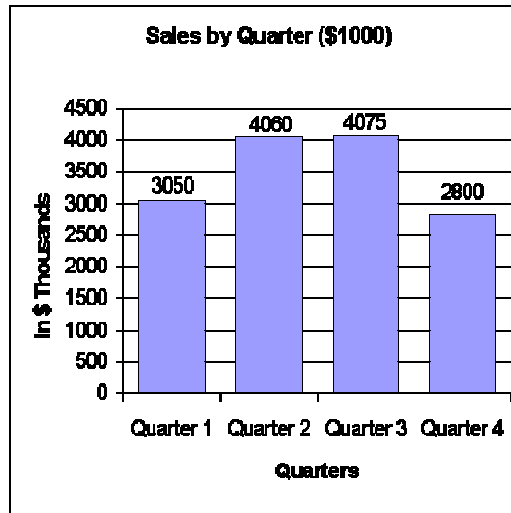
1. Line Graph

- Typically used to show the relationship between two sets of data, usually the progression of an observation over time.
- Then a line is drawn to connect the dots. This type of graph is useful for showing "trends".
- It quickly shows if sales are going up or down.
- Data from the "dependent variable" should go on the Y axis. This is also known as the "responding variable" and is what you are measuring or observing.
- Data from the "independent variable" is placed on the X axis. This is also known as the "manipulated variable" and is what you are choosing to look at in terms of time or temperature (Usually).
- To space your numbers correctly: divide the range of numbers by the number of lines you have available for your graph.
- Example: If your numbers ranged from 60 to 281 and you had 13 lines on the graph.
- Range : $281 - 60 = 221$ $221 / 13 = 17$
- Each line represents 17. However, it may be best to round it UP to 20 for ease of graphing



2. Bar Graph

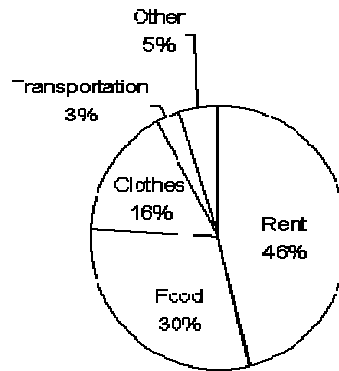
- This type of graph is very useful for comparing two or more similar items.
- Points are plotted representing various data. A bar or rectangle is drawn from the x or y axis to the point. (That is, the starting point where x or y = 0 to the plotted point.) Bar graphs can therefore be drawn horizontally or vertically.



- When there are several sets of data and bars or lines are plotted in different colors, the small square in the rectangle at the right, called the "Legend" or "Key" will let us know what the data means.

Pie Chart

- The data in this graph totals 100% and this graph is used to see which section is the largest, for example, and what sections are much smaller.
- This graph is especially useful to show how money has been spent as in a budget.



Analyzing Biological Data

- Computers help scientists to gather, analyze, and present large quantities of data.
- Analyses of data are used to make predictions about complex phenomena.