Graphing

The most common types of graphs are: *Circle / Pie, Line, and Bar.*

Independent variable: *changed by the experimenter; placed on the "x" axis.*

Dependent variable: *changes in response to another variable; placed on the "y" axis.*

Tick marks: *the evenly spaced lines drawn on the axis lines.*

Title: *accurately describes the information to be found on the graph; usually it is written as "the name of the dependent variable vs. the name of the independent variable".*

Units: *placed in parenthesis after the axis titles*

Circle / Pie Graphs:

~ Divided into parts like a pie.

~ Compares how one part relates to the whole amount.

~ Can quickly show the fraction, %, share, or portion of the whole each part represents.

~The sum of the categories is 100%.

~Data shows how one part / category (%) relates to the whole amount (100%).

~If given data that is standard numbers and not a percent, you can determine the percent by:

1. Add all of the numerical values together to obtain a "total".
2. Then for each category, use the equation %=(part/whole)100

~Two ways to determine how much of the graph to shade per category:

1. If there are sections already drawn in on your graph paper, count the sections and use that as your "whole" in the equation above and use your known percentage as the" %". You will then be finding the "part" which will be how many sections to shade for that category.
2. If there are no sections drawn in, first determine the number of degrees of the angle for each category by taking the percent (in decimal form) and multiplying it by 360 (the number of degrees in a circle.) Then you will use a protractor to measure and draw in each appropriate section.

~ To complete the graph, it must have a title, key, all sections must be shaded neatly and completely, and all categories must be shown.
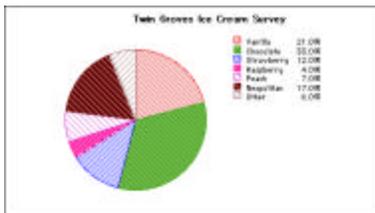
Line Graph:

~ Lets you compare more than one set of numerical data.

~ Shows change over a period of time.

~ They are made up of points derived from x and y data points.

~ Has an "origin".

~ When the points are connected, the line is called a "curve" even if it is straight.

~ Allows for several data sets to be displayed on the same graph as separate lines if a key is present.

~The slope of a curve is often used to determine a derived value such as density, acceleration, speed, etc.

~ Positive slope: as x increases, y also increases.

~Negative slope: as x increases, y decreases.

~To determine the slope:

$$m = \triangle y \ / \ \triangle x$$

← Positive

←Negative
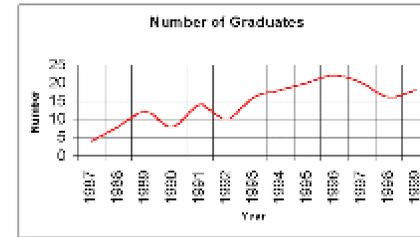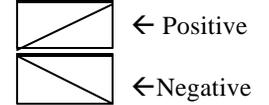
Bar Graph: (aka: Histogram)

~ Shows comparisons of categories.

~ Can compare measurements about individuals, groups, or items.

~ Can compare heights, weights, lengths, temperatures, etc.

~One set of data is broken into categories.

~Data is non-numerical for at least one set of data.

~Sometimes there is no dependent or independent variable.

~ Normally the quantity is shown on the "y" axis and the type of item is shown on the "x" axis.

~You can display multiple sets of data side-by-side as separate bars if you provide a key.

~You can place specific data at the top of a bar or inside the bar if your increments are large.