Graphing and Analyzing Scientific Data

Graphing is an important procedure used by scientist to display the data that is collected during a controlled experiment. There are three main types of graphs:

 Pie/circle graphs: Used to show parts of a whole.

 Bar graphs: Used to compare amounts.

 Line graphs: Use to show the change of one piece of information as it relates to another change.

Both bar and line graphs have an “X” axis (horizontal) and a “Y” axis (vertical).

**Parts of a Graph**:

 **Title:** Summarizes information being represented in ANY graph.

 **Independent Variable:** The variable that is controlled by the experimenter, such as, time, dates,

depth, and temperature. This is placed on the **X** axis.

 **Dependent Variable:** The variable that is directly affected by the I.V. It is the result of what

happens as time, dates, depth and temperature are changed. This is placed on the **Y** axis.

**Scales for each Variable:** In constructing a graph, one needs to know where to plot the points representing the data. In order to do this a scale must be employed to include all the data points. This must also take up a conservative amount of space. It is not suggested to have a run on scale making the graph too hard to manage. The scales should start with 0 and climb in intervals such as, multiples of 2, 5, 10, 20, 25, etc…the scale of numbers will be determined by your data values.

**Legend:** A short descriptive narrative concerning the graph’s data. It should be short and concise

and placed under the graph.

For any set of data, you will need to determine the following:

 **Mean:** This is determined by adding all the numbers in a set of data and then dividing by the

 number of values.

 **Median\*:** This is the middle number in a set of data. If the there is an even set of numbers in the

 data, then take the average of the two middle numbers.

 Ex: 2, 3, 4, 8, 12, 16, 20 median = 8

 Ex: 3, 5, 8, 11, 17, 19, 27, 30 median is 11 + 17 = 28/2 = 14

 **Mode\*:** This is the number that occurs most often in a set of data.

 Ex: 3, 4, 6, 6, 7, 9,9,9, 12, 12, 15 mode = 9

**\* To determine median and mode, the numbers in the set of data must be put in numerical order.**

 **Extrapolate:** extending the graph, along the same slope, above or below measured data.

 **Interpolate:** predicting data between two measured points on the graph