**Math 10 – Data Management**

1.1 – Variables and Relationships

**Variables:** any measured quantity that changes in an experiment or relationship

**Independent variables:** are factors that *affect* another factor in an experiment or relationship

**Dependent** **variable:** is the factor that *is affected* by other factors in an experiment or relationship

**Controlled variable:** any independent variable whose value is held constant during an experiment

**Controlled experiment:** any experiment in which all but one independent variable are controleld

1.2 – Measuring

**Accuracy:** how close the recorded measurement is to the real measurement (depends on how you use the tool)

**Precision:** the smallest unit that can be measured with confidence using a tool (ie: a cm ruler is not as precise as a mm ruler)

Calculating with the Appropriate Level of Precision

-When calculating, your answer will not be any more precise than your least precise measurement.

**Rules for Digits that are Significant:**

-include all non-zero digits (2.59=three sig. digs.)

-include any zeros between two non-zero digits (507 – three sig digs)

-include any zeros to the right of both the decimal point and a non-zero digit (4.60 = three sig. digs.) or (700.0= four sig.digs.)

-include all digits (zero or non-zero) used in scientific notation (8.7060 x 10³ = five sig. digs.)

**Rules for Digits that are not Significant:**

-any zeros to the right of a decimal point but preceding a non-zero digit (0.00000045= two sig. digs.)

-any zeros to the right of a non-zero digit (38 0000 = two sig. digs.)

*Adding or Subtracting*

-your answer can only show as many decimal places as the number having the fewest decimal places

*Multiplying or Dividing*

-your answer can only show as many significant digits as the number having the smallest amount of significant digits.

Measures of Central Tendency

**Mean:** the average of the data (add the data then divide by the number of data points you have)

**Median:** the middle data point (put the points in order)

**Mode:** the data point that appears the most. It is possible to have no mode, but do not mark it as zero … instead put “no mode”

**Outliers:** data points that are significantly different from the majority of the data points (one of these things is not like the other)

Stem and Leaf Plots

**Stem and leaf plot**: a way to organize data into categories based on place values

-are used to organize data in order of size

-can be used to find the range and all three measures of central tendency

-shows how data is distributed

**Distribution:** how all the data values in a set of values are spread

**Range:** the difference between the least and greatest value in a set of data

*How to create a stem and leaf plot:*

-divide each piece of data into two parts: a stem and a leaf

-the last digit of each number is the leaf and all the other numbers are the stem

-the data are then organized by grouping together data items that have the same stems

-you cannot leave out numbers in the stem, they must go from one end of the range to the other… if there isn’t a leaf for the number in the stem, leave it blank and move on, do not put zero as placeholders… it will look like a number

Example:

30, 37, 40, 43, 44, 45, 51, 52, 53, 54, 56, 56, 62, 64, 65, 66, 74

