

Objectives:

- To begin to use your graphing calculator/ Minitab as an indispensable tool for analyzing data
- To understand the need to ask whether a variable actually measures the property that it purports to
- To recognize that elementary manipulations of variables can often produce a more appropriate variable to measure the desired property
- To appreciate the use of **rates**, **ratios** or **percentages** for making meaningful comparisons in many situations
- To recognize limitations of a variable for measuring some properties.
- To understand the idea of **statistical tendencies** and analyze their meaning
- To understand the idea of **consistency**

Context is what is needed to make a number a piece of data. (Repeated for emphasis – *important*)

Since the context of the number is important in the determination of if it is data then we should always describe the context when conveying the number. *i.e.* It is better to say that “the smallest number of states visited is 12” as opposed to “the smallest item in the data set is 12” (No context - difficult to understand meaning.)

Rates, Ratios or Percentages: When a variable involves counting the number of objects that belong to categories of different sizes rates and percentages have much more meaning than the actual numbers.

These variables were seen in Topic 1 and revisited in Topic 2 therefore I am listing them again here.

Variable: any characteristic of a person or thing that can be assigned a number or category

Measurement variable: one that can assume a range of numerical values (Number of states)

Categorical variable: one that records a category designation (Republican, Democrat, Conservative, etc.)

Binary categorical variables: a variable that has exactly two possible categories (gender, coin flip)

Observational unit or case: The person or thing that is assigned the number or category (each person in the class when asking the topic questions would be an observational unit)

Distribution of variables: The pattern of variability of a set of data, much of statistics is finding way to express this distribution and analyzing the meaning or effects of the distribution.

Visual displays of distributions include:

- *dotplot - for expressing measurement variable distributions*
- *bar graph - for expressing categorical variable distributions.*

Numerical display of the spread of a distribution: *Standard deviation.*

Frequency: process of tallying the individual cases into to find the number of occurrences of each possible response.

Statistical Tendency: When one group (categorical variable) is more likely to have a higher value (Quantitative variable) than another group

Consistency: How spread out or variable a dataset is.

Hopefully, something you realized in Topic 1 and even more in Topic 2 is the importance of first analyzing a set of data using a visual display. This gives you some basic understanding of the nature, distribution and any “weird” or interesting characteristics of the data you are looking at. It also gives your mind a reference frame from which to begin your numerical analysis of the data.