

Name: \_\_\_\_\_  
AP Statistics Summer Assignment

AP Statistics  
Mrs. Wallace

Welcome to AP Statistics at James Madison!

You are about to embark on a journey into mathematics that applies to everyday life every day of the year. This journey will shape the way you view the world and will empower you to understand and evaluate the truth behind the statistics that are thrown at you as a member of a society driven by media and information. This course requires self-discipline and honest effort throughout the year. The classroom environment is relaxed where learning grows from personal responsibility, motivation and integrity. There is no greater reward than the light of comprehension following academic vigilance.

Please review the list below of required materials and have them with you the first day of school. Feel free to email me with any questions that you may have: [Jessica.Wallace@fcps.edu](mailto:Jessica.Wallace@fcps.edu).

On the pages that follow I have compiled (1) a list of Fundamental Vocabulary with Definitions and (2) a Data Collection Assignment. Reading the vocabulary and completing the Data Collection is suggested as preparation; the Data Collection Assignment will frame the basis of analysis for the first unit:

**Description of Data: Graphical & Tabular Displays.**

Required Materials:

- Data Journal: Graph Paper Composition Notebook. From experience typical graph paper loose-leaf notebooks disintegrate after 2 months. Any well-bound graph paper notebook, such as an engineering notebook is acceptable. Spiral Graph paper notebooks are discouraged.
- Graphing Calculator: TI-84 Silver Plus is preferred, having extra applications for statistics. Any TI-83 or TI-84 series is acceptable.
- Loose-leaf Graph paper for homework assignments.
- Binder or notebook and folder for handouts & class notes.

I look forward to working with you this fall. Have a restful summer.

Regards,

Mrs. Jessica Wallace

### Fundamental Vocabulary & Definitions:

- A **variable** is any measurable or observable *characteristic* of a group of objects or people.
- **Data** are the *actual* observations or measurements of a variable. Data are classified by the type of value they represent.
  - The variable “ages of children” has data values in the set  $5,6,9,12$  .
  - Data are either **Quantitative** or **Qualitative**.
- **Quantitative Data** are data that take on numerical values, as in a count a percentage or a specific measurement with units, all describing a sample or population numerically. Values of quantitative data can be described by numerical measures, *i.e.* the numerical average, called the **mean** value. Quantitative data can be classified as **discrete** or **continuous**.
  - **Discrete** quantitative data consist of data that are a listable, or *finite*, set of values. Counts, such as the number of females, and shoe sizes (either whole numbers or half sizes) are discrete data.
  - **Continuous** quantitative data consist of data that can take on any values in the domain of the variable. Examples of continuous data are measurements of any kind, heights or weights of a group of people, which values are limited only by the instrument of measure.
- **Qualitative (a.k.a. Categorical) Data** are data whose values describe a characteristic of a sample or population.
  - Eye color, gender, race are all categorical values, each represented by a verbal description.
- A **population** is the entire collection of objects or people of interest.
  - A **parameter** is a numerical value that describes a characteristic of data contained in a population.
  - A population **parameter** is a unique value that does not change.
- A **sample** is a subset of the population, a selection from a population.
  - A **statistic** is a numerical value that describes a characteristic of data contained in a sample.
  - A sample data may consist of (1) values taken from a selected group of the population or (2) the results from a repeated process, such as flipping a coin, rolling a die or simulation of events.

Common statistics & parameters:

<i>Quantity</i>	<i>Statistic</i>	<i>Parameter</i>
Mean	$\bar{x}$	$\mu_x$
Standard Deviation	$s_x$	$\sigma_x$
Proportion	$\hat{p}$	$p$

- A **Distribution** of data conveys (1) the values the variable takes (whether quantitative or qualitative) and (2) how often it takes those values, *i.e.* the **frequency** of each value. Distributions can be represented graphically, or in a table or a chart, depending on the type of data.

## Data Collection Assignment:

The **purpose of statistics** is to gather data, organize them, display them graphically, and analyze them visually and numerically, to observe patterns, determine relationships, draw conclusions about the data and make inferences from data. **NOTE: data** is a plural form of **datum**, a single value gathered from measurement or observation.

## Goals of Assignment:

- To demonstrate the existence of data in the everyday life for each individual student.
- To provide the class with sets of data that will be organized in graphical displays & tables throughout the first unit of study.

## Outline of Assignment:

1. Students will gather two sets of data from the following options: (1) a set of quantitative univariate data from observation, (2) a set of quantitative univariate data from measurement, (3) a set of quantitative bivariate data from measurement, (4) a set of qualitative (categorical) univariate data, (5) a **set of qualitative bivariate data**. **“Boring” examples are listed below; please collect data of interest to you.**
  - **Univariate data** (one-variable data) are data that describe a single characteristic of a population. The data generated by observing the value of one variable for each subject or event is univariate.
    - Quantitative univariate data from observation: the number of cars that pass a certain intersection at the same time on different days of the week (counts of an event) or the number of text messages sent on each of 30 days.
    - Quantitative univariate data from measurement: record the daily temperature at the same time of day for 30 days or the amount of time to travel a certain distance, by car or exercise.
  - **Bivariate data** (two-variable data) are data that describe two characteristics for each subject and are collected in paired sets,  $x, y$ .
    - Quantitative Bivariate Data from measurement: Record the height in inches and weight in pounds for a set of individuals.
    - Qualitative Univariate data from observation: Record the favorite flavor of ice cream for a set of individuals.
    - Qualitative Bivariate Data from observation: Record the eye color and hair color for a set of individuals.
2. Students will then type the data into an Excel spreadsheet, indicating the type of data compiled, and labeling the columns and rows as appropriate. Each data set should contain a minimum of 30 observations or measurements. The **Excel file name should include the student’s last name; one Excel sheet per data set.**
3. Completion of the assignment is verified when the Excel spreadsheet is emailed to me: [Jessica.Wallace@fcps.edu](mailto:Jessica.Wallace@fcps.edu).