

2017 AP Statistics Summer Assignment

Welcome to AP Statistics! Get ready for a year of math unlike any that you taken before. Rather than rudimentary methods, you will be asked to *think, reason, explain, and justify* all of your responses. With this, you will view all of the information presented to you in your daily life with a new and refined perspective. The purpose of this assignment is to provide you with an introduction to the course and will aid in a strong start in September. This will allow ample time to cover the material for the AP Exam.

Every student in this class will be expected to complete this summer assignment. A brief homework quiz will be given on the first day of class. The entire summer assignment will be assessed as a quiz grade on the second block of class. Therefore, it is important that you complete this packet to the best of your abilities. You may need to research some of the topics on your own in order to complete all three sections of the summer assignment. Please use your resources wisely during your research. You can also email me at cwendland@rbrhs.org.

Part I) Vocabulary

Part II) Exploring Data

Part III) Summary Questions

Part I) Vocabulary

Define each of the terms below. While defining the vocabulary, be sure to completely *understand* the term.

a) Individuals:

b) Variable:

c) Categorical Variable:

d) Quantitative Variable:

e) Distribution:

f) Marginal Distribution:

g) Conditional Distribution:

h) Association:

i) Symmetric Distribution:

j) Skewed Distribution:

Part II) Exploring Data

To complete this section, you may use a graphing calculator or graph by hand (on graph paper!) to construct your graphs. You may also need to complete some research online or with a textbook in order to answer the questions. A graphing calculator is required for this section.

Scenario and Data

Scores (in percentages) for the first test of the year for two AP Statistics classes are provided below. The class “First” meets first period of the day, every day of the school year. The second class “Last” meets last period of the day, every day of the school year. There are 21 students in the First class and 30 students in the Last class:

First Scores: 98, 52, 92, 92, 60, 66, 90, 86, 86, 70, 72, 84, 82, 82, 82, 82, 74, 74, 76, 80, and 80 (checksum: 1,660).

Last Scores: 96, 95, 92, 54, 57, 58, 86, 85, 82, 82, 82, 60, 66, 66, 66, 68, 80, 80, 77, 76, 76, 75, 74, 74, 74, 73, 72, 72, 71, and 70 (checksum: 2,239).

The AP Statistics teacher would like to conduct an analysis that compares the grades of the classes to determine if there is a difference in skill level between the students in the two classes.

Section 1: Graphing Calculator

- a) Enter the data sets into two columns in the list processor of your graphing calculator. Order the data from highest to lowest.
- b) Use the checksum numbers above to ensure that you entered your data correctly. The sum of each data set should equal its checksum.
- c) Use your calculator to find the mean and standard deviation of each class.

First Mean: _____ Last Mean: _____

First Standard Deviation: _____ Last Standard Deviation: _____

Which standard deviation did you record above, s or σ ? Explain why:

d) Create a 5-number summary for each class.

	First	Last
Min		
Q1		
Median		
Q3		
Max		

e) Identify any outlier(s) in these data sets. Explain why they're outliers. (Your explanation should include work!)

f) Create modified box plots of the data for each class.

Explain in a sentence or two the usefulness of a box plot when analyzing data.

g) Create back-to-back stemplots for the data sets; split your stems if necessary. Explain in a sentence or two the particular usefulness of a stem-and-leaf plot in analyzing data.

h) Make a frequency table of A's (90-100), B's (80-89), C's (70-79), D's (60-69) and F's (<60s) for each class, then create a histogram for each class.

Explain in a sentence or two the particular usefulness of frequency tables and histograms when analyzing data.

i) Create a table that displays marginal grade summaries and marginal distributions.

Grades	FIRST Frequency	LAST Frequency	Totals	Marginal Distribution (%)
A (90 +)				
B (80-89)				
C (70-79)				
D (60-69)				
F (< 60)				
Totals				

In a sentence or two, comment on the marginal distribution percentages that you calculated.

j) Compare the conditional probabilities of the grades for FIRST and LAST (e.g. what is the conditional probability that a student will get a grade of B or better given that s/he is in the FIRST PERIOD class). Complete the table and write a few sentences explaining your findings.

Conditional Distribution Table

Grades	First Period Conditional	Last Period Conditional
A (90 +)		
B (80-89)		
C (70-79)		
D (60-69)		
F (< 60)		
A or B		
A, B or C		
C, D or F		
D or F		

Part III) Summary Questions

Use the data, tables, summaries and visual displays you created, to answer the following questions. Your answers should be written or typed on a separate paper.

- (1) Describe the shape of the data for each data set (shape, center, and spread).
- (2) Discuss your numerical findings in general, comparing the data of these two classes. What conclusions can you make?
- (3) Should the AP Statistics teacher conclude that there is a difference in the level of abilities between the students in the two classes? Support your answers in 3-5 sentences using your data.
- (4) Are there factors besides student ability that might be affecting this data? Using your experiences as a student, identify some possible factors and support your arguments in 3-5 sentences.
- (5) What recommendations would you make to the AP Statistics teacher regarding these two classes? Be specific in your recommendations and support your answers.