AP Statistics Summer Assignment

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Introduction video link: AP Stats Summer Assignment Intro Video.mp4

INTRODUCTION: READ THIS CAREFULLY!

Welcome future statisticians! The purpose of this summer assignment is to make you comfortable with the primary data displays used during this Statistics class and to review skills that we expect you to have before starting the course.

This is not like any other math class you have ever taken!
Skills Required for Success in AP Statistics:

Arithmetic: AP Statistics does not require a whole lot of complex math – certainly no calculus. But you will be using a lot of equations, so a general "number sense" is a great help. You will need a basic mastery of arithmetic and algebra. More complicated topics will be (re)taught.

Graphical Literacy: There is a lot of graphing involved in AP Statistics. What we mean here is the ability to look at a graph and gain a good sense for what information is expressed there. This is the kind of thing tested on the ACT Science section, for example.

Statistical Reasoning: This is the primary skill that you will work on at every single stage of your AP Statistics class. In short, this is the ability to use appropriate statistical language when describing your findings. For example, "Because the p-value is less than the level of significance, we may reject the null hypothesis in favor of the alternative hypothesis." **You will be required to communicate, in writing, you're reasoning to support your decision.**

Prerequisite Skills: Topics that should have a good understanding prior to taking AP Statistics

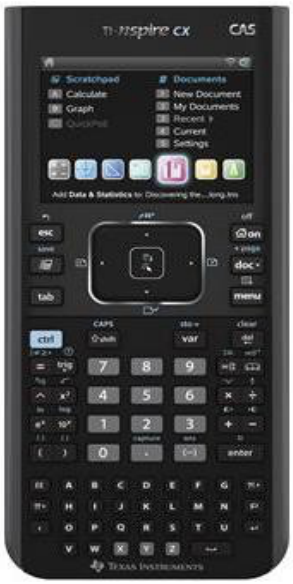
Basic statistical plots: box-and-whiskers plots, scatter plots, bar graphs, histograms, circle (pie) graphs, and stem-and-leaf plots. (We will be reviewing these in class besides what is here on the summer assignment

"Plug-n-chug" Solving for a missing variable in a formula.

Basic statistical calculations: Mean/Median/Mode, Simple and CompoundProbabilities, Percentages of totals, etc.

Remember, this is an AP course! Do not expect this to be an "easy course." Although it may not seem as difficult computationally as calculus, it requires outside reading and homework, and a thorough understanding of many abstract concepts. **It will move at a moderate pace.** The most important aspect of our study willbe to communicate to others what the data is telling us both orally and in written form. **This is as much a writing course as it is a math course**. Explaining in complete thoughts (sentences) is required on this assignment and throughout the course.

VISTA MURRIETA HIGH SCHOOL:
AP STATISTICS
CALCULATOR INFORMATION



A TI-*n*spire calculator is recommended for this course

IT IS STRONGLY RECOMMENDED THAT YOU PURCHASE YOUR OWN TI-Nspire CAS or TI-Nspire II CAS for the course. You may also use a TI-84 which can be checked out at the library.

There are several models of this type of calculator, and two versions of each: CAS and non-CAS.

For AP Statistics, CAS or non-CAS are acceptable.

IT IS STRONGLY RECOMMENDED THAT YOU PURCHASE YOUR OWN CALCULATOR.

We have a class set if the TI-*n*spire we will be using in the class.

Recommended models: **Texas Instruments® TI-Nspire CX CAS**
TI-Nspire II CX CAS

The "CAS" model calculator is NOT available in retail outlets. You will need to purchase this online at a site like www.schoolmart.com or www.amazon.com. Many students have found good deals on used TI-Nspire CX CAS calculators on ebay as well. **Be sure you purchase a calculator with the letters "CAS" in the upper corner of the calculator.** (The non-CAS version of the CX is in stores however, but as stated earlier, we would prefer students have the CAS model as it is much more beneficial.) .

For questions or for more information, feel free to email Mr. Truax at btruax@murrieta.k12.ca.us

About the AP Statistics Exam

It is expected that everyone who takes the AP Statistics course will take the AP Statistics exam in May. Students who receive a 3, 4, or 5 on the AP Statistics exam will earn credits at many colleges and universities.

Directions for Summer Assignment:

This assignment is due the first Wednesday of the school year.

The assignment will be graded on completion and accuracy (correctness). Late work will be penalized 10 points for everyday day late. The points attached to this assignment are equal to 50 homework points. Doing a good job here will lay a strong foundation for the rest of the semester. Please take this assignment seriously. What you turn in is to be YOUR OWN WORK. Do your best!

THIS PACKET MUST BE COMPLETED BY: Monday, August 11th, 2025, Inclass

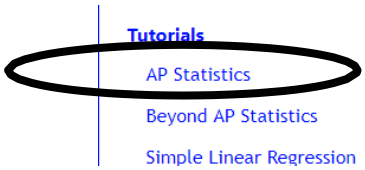
Contact me via email if you have any questions. btruax@murrieta.k12.ca.us

PART 1: READING

You will use a free online Statistical tutoring site that will give you information on variables and data displays. While reviewing the information on the site, you will be completing a vocabulary list (see next two pages). Follow the steps below:

1. Go to www.stattrek.com

2. On the left sidebar, under "Tutorials" click "AP Statistics"



3. On the left sidebar is a list of general topics. When you click on a topic, you will see subtopics.

4. Read and complete the tutorial for the following subtopics

Exploring Data:

The Basics

- ☐ Variables
- ☐ Population vs sample
- ☐ Mean and median

Charts and Graphs

- ☐ Patterns in data
- ☐ Dotplots
- ☐ Histograms
- ☐ Stemplots
- ☐ Boxplots
- ☐ Scatterplots

Anticipating Patterns:

Probability

- Probability intro
- Rules of probability

PART 2: VOCABULARY LIST

Define each of the following terms from the information based on the stattrek reading from part 1. When asked to provide an example, please give a unique example of your own NOT the one from the website.

1. Define: Categorical/Qualitative Variables

Examples:

2. Define: Numerical/Quantitative Variables

Examples:

3. What is the difference between Univariate Data and Bivariate Data?

4. What is the difference between a Parameter and a Statistic? *Give an example of each.*

5. Define: Median

6. Define: Mean

7. Draw an example of a Dotplot

Draw an example of a Stemplot

8. What is the difference between a bar chart and a histogram?

9. What values are used to make a Boxplot?

10. Explain briefly what the Law of Large Numbers means with respect to flipping a coin repeatedly.

11. Define these probability terms:

Mutually exclusive:

Complement:

Union:

Intersection:

12. What is the difference between Independent and Dependent event

PART 3: Practice Problems

Complete the following practice problems using the information from stattrek. You may also use the QR Code to find a helpful video.

CATEGORICAL OR NUMERICAL?

Determine if the variables listed below are NUMERICAL (Quantitative) or CATEGORICAL (Qualitative). If the variable is quantitative, identify it as either DISCRETE or CONTINUOUS.

13. Time (in minutes) it takes to get to school

14. Number of people under 18 living in a household

15. Hair color

16. Teacher salaries

17. Gender

18. Do you smoke tobacco products?

19. Age of Oscar winners

20. Type of Depression medication

21. Number on Sports Jersey

22. Number of shoes owned

STATISTIC: WHAT IS THAT?

A statistic is a number calculated from data. Quantitative data has many different statistics that can be calculated. Determine the given statistics from the data at the right on the number of homeruns Mark McGuire hit during each season from 1982 to 2001.

70	52	22	49
3	32	58	39
39	65	42	29
9	32	9	33

23. Mean:

24. Q1:

25. Minimum:

26. Median:

27. Maximum:

28. Q3:

29. Range:

30. IQR:

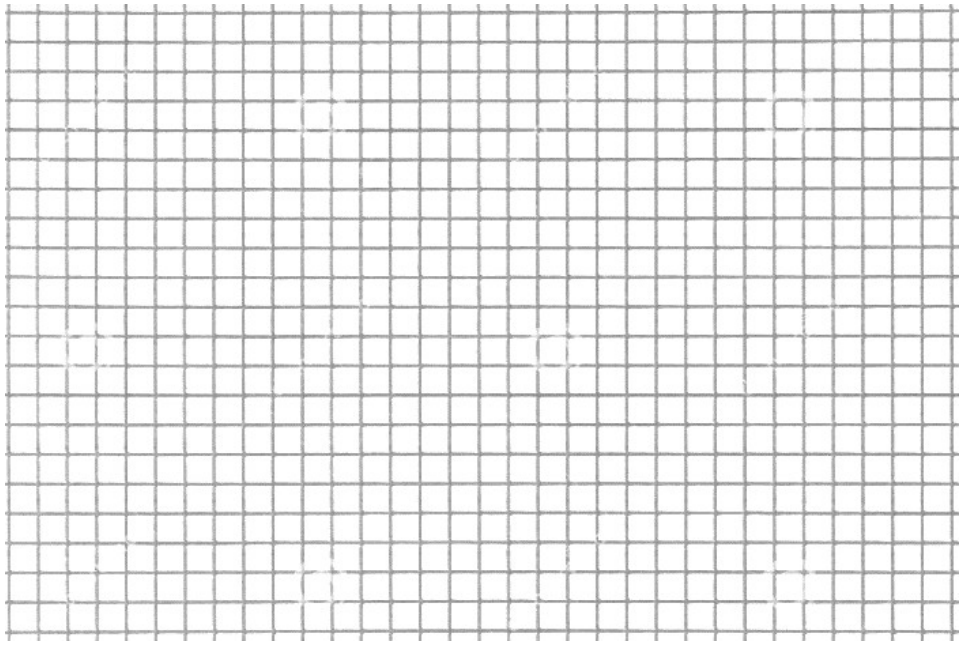
ACCIDENTAL DEATHS:

In 1997 there were 92,353 deaths from accidents in the United States. Among these were 42,340 deaths from motor vehicle accidents, 11,858 from falls, 10163 from poisoning, 4051 from drowning, and 3601 from fires. The rest were listed as "other causes."

31. Find the <u>percent</u> of accidental deaths for each of these causes, rounded to the nearest percent.

motor vehicle accidents:	drowning:
falls:	fires:
poisoning:	other causes:

32. NEATLY create a **well-labeled bar graph** of the distribution of causes of accidental deaths. Be sure to include an "other causes" bar. *(EVERY GRAPH YOU MAKE must have labels on the x-axis and y-axis as well as a scale for each axis – if it applies)*



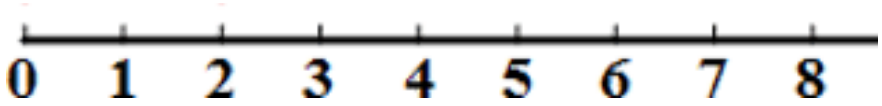
33. Create a pie chart for the accidental death percentages. You may do this by hand or try using a software or internet source to make one and then paste it in the space below. (Microsoft Excel works well)

IT'S A TWISTA

The data below gives the number of hurricanes that happened each year from 1944 through 2000 as reported by *Science* magazine.

3	2	1	4	3	7	2	3	3	2	5	2	2	4	2	2	6	0	2	5	1	3	1	0
3	2	1	0	1	2	3	2	1	2	2	2	3	1	1	1	3	0	1	3	2	1	2	1
1	0	5	6	1	3	5	3															

34. Use the provided number line to make a dotplot to display these data. Make sure you include appropriate labels, title, and scale.



SHOPPING SPREE!

A marketing consultant observed 50 consecutive shoppers at a supermarket. On variable of interest was how much each shopper spent in the store. Here are the data (round to the nearest dollar), arranged in increasing order.

3	9	9	11	13	14	15	16	17	17
18	18	19	20	20	20	21	22	23	24
25	25	26	26	28	28	28	28	32	35
36	39	39	41	43	44	45	45	47	49
50	53	55	59	61	70	83	86	86	93

35. Make a stemplot using tens of dollars as the stem and dollars as the leaves. Make sure you include appropriate labels, titles, and key.

SSHA SCORES

Here are the scores on the "Survey of Study Habits and Attitudes (SSHA) for 18 first-year college women:

154, 109, 137, 115, 152, 140, 154, 178, 101, 103, 126, 126, 137, 165, 165, 129, 200, 148

36. Put the data values in order (above) Then, compute numeral summaries.

	Women
Mean	
Minimum	
Q1	
Median	
Q3	
Maximum	
Range	
IQR	

37. Make a boxplot for the women

ALGEBRA MEMORIES: Solve for missing variables

Here is a formula that is used often in AP Statistics: $Z = \frac{x-\bar{x}}{s}$

Show your work

38. If x = 6, $\bar{x} = 7$, and s = 0.35, what is z?

39. If z = 2.5, x = 102, and $\bar{x} = 100$, what is s?

40. If z = -3.35, x = 60, and s = 4, what is $\bar{x}$?

ALGEBRA MEMORIES: Understand Linear Functions

The USDA reported that in 1990 each person in the United States consumed an average of 133 pounds of natural sweeteners. They also claim that this amount has decreased by about 0.6 pounds each year.

41. Write a linear equation that related years since 1990 to the average consumption of natural sweeteners. Be sure to define your variables.

42. What is the slope and y-intercept for your linear equation in #38?

43. Use your equation in #38 to predict the average consumption of sweeteners per person for the year 2005.

The following equation can be used to predict the average height of boys anywhere between birth and 15 years old: $y = 2.79x + 25.64$ where x is the age (in years) and y is the height (in inches).

44. What is the slope? Explain what the slope means or represents in the context of this problem.

45. What is the y-intercept? Explain what the y-intercept means or represents in the context of this problem.

ALGEBRA MEMORIES: Simple Probability

_____ **46.** A special lottery is held to select the student who will live in the only deluxe room in a dormitory. There are 100 seniors, 150 juniors, and 200 sophomores who applied. Each senior's name is placed in the lottery 3 times; each junior's name 2 times; and each sophomore's name, 1 time. What is the probability that a senior's name will be chosen?

A) $\frac{1}{8}$ **B)** $\frac{2}{9}$ **C)** $\frac{2}{7}$ **D)** $\frac{3}{8}$ **E)** $\frac{1}{2}$

_____ **47.** Which of the following has a potential for a probability closest to 0.5?

A) The sun will rise tomorrow.
B) It will rain tomorrow.
C) You will see a dog with only three legs when you leave the room.
D) A fair die will come up with a score of 6 four times in a row.
E) There will be a plane crash somewhere in the world within the next five minutes.

_____ **48.** If a coin is tossed twice, what is the probability that on the first toss the coin lands head and on the second toss the coin lands tails?

A) $\frac{1}{6}$ **B)** $\frac{1}{3}$ **C)** $\frac{1}{4}$ **D)** $\frac{1}{2}$ **E)** 1

_____ **49.** If a coin is tossed twice, what is the probability that it will land either heads both times or tails both times?

A) $\frac{1}{8}$ **B)** $\frac{1}{6}$ **C)** $\frac{1}{4}$ **D)** $\frac{1}{2}$ **E)** 1

50. Calculate the following probabilities

A: The probability that a fair die will produce an even number.

B: A random digit from 1 to 9 inclusive is chosen with all digits being equally likely. The probability that when it's squared it will end with the digit "1".

C: The probability that a letter chosen from the alphabet will be a vowel.

D: A random number between 1 and 20 (inclusive) is chosen. The probability that its square root will not be an integer.

51. Arrange the letters from #50 based on probabilities from greatest to least:

_____, _____, _____, _____

***** CONTACT ME AT: btruax@murrieta.k12.ca.us if you have any questions!**
This packet is due the FIRST DAY OF SCHOOL! ****