AP Statistics, 2018-2019
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Welcome to AP Statistics!

Philosophy

Statistics is everywhere in today's society. You do not go a single day without hearing about some study and/or conclusions from a study or an experiment. AP Statistics is designed to be an interactive, thought provoking course, which allows you to construct your own understanding of concepts and techniques of statistics. As such, you will be pushed to think at a higher level. This course will impact your thinking and the way in which you view the world. The goal of the course is to teach you to think carefully about collecting and analyzing data. As such, examples, assignments, projects, etc. will always be tied to the real world. If you find statistics, bring them in and share what you have found.

I am not here to lecture to you, but to facilitate your learning and guide your explorations and formation of hypotheses. You will learn appropriate statistical techniques and a variety of ways to communicate them within the context of statistical activities and experiences. You will gain a working knowledge of statistical vocabulary and will be expected to use it correctly every day. You will also learn to be a competent interpreter and investigator of statistical data and information. In order to do so, you will be expected to be actively engaged in class. You will learn how to make connections between all aspects of the statistical process, including design, analysis, and conclusions. You will be responsible for communicating methods, results, and interpretations using the correct vocabulary.

Special Requirements

As this is an AP level class, there will be several extra requirements:

- You will be required to take the AP Statistics exam on Thursday, May 16, 2019.
- You will be expected to take a three-hour practice test outside of school in April 2019.
- You will need to attend before or after-school study sessions when necessary.

Technology

You are expected to use a graphing calculator at all suitable times. You will need to have access to TI-83 or TI-84 calculator throughout the course and on the AP exam. Appropriate calculator skills will be taught throughout the course. (Recommended calculator: TI-84 Plus)

Warning!

This is not your typical "math" class. Although strong math skills are beneficial, reading, writing, and critical thinking skills are necessary for success in this class.

Trying to decide if you want to take AP Stats? Here's some advice from previous AP Stats students:

"Take it! It's really interesting and has no scary-math-stuff." (Disclaimer: probability is a little scary)
"It's not a math class, it's a theory based course with critical thinking."
"You should take it, it can be applied to any college major and it's a nice break from "normal" math and a great alternative to calc!"
"Don't take it, if you don't want to work."
"It's a lot of work, but it is math that you will use often and is beneficial."
"Think about your work load and decide whether you can handle this class or not."

Already signed up for the class? Here's some advice from previous AP Stats students:

"Actually DO the homework – it helps!"
"Always do the homework, because that really helped me grasp the concepts. You have to try it yourself, to truly get it."
"Don't let senioritis kill you! The most important part of the class comes at the end."
"Study early on – study as often as you can, don't cram!
"Go to class. If you attend class you'll do fine."

Helpful Websites:
https://www.khanacademy.org/math/ap-statistics
http://www.apstatsmonkey.com/StatsMonkey/Statsmonkey.html

Failure to complete the summer assignment will be a BIG indication that you are not ready to take on the challenge of this class. It is not acceptable for you to come to class on the first day and say, "I didn't understand what you wanted me to do." I will check my e-mail throughout the summer and respond to any questions you send me.

Summer Assignment

Please sign up for our remind! Text: **@bgstats19** To: **81010**

Part 1: Due via email by **Friday, August 10, 2018** (aberrygu@pasco.k12.fl.us)

Tell me about you! Be honest and write a one-page document (typed, double-spaced, Times New Roman, 12-point font) answering the following questions:

1. What do you want me to know about you? What are your hobbies? What are your dislikes/likes? What extracurricular activities are you involved in? Do you have a job? What makes you unique?
2. How do you feel about math? What math class did you take in the 2017-2018 school year? How did you do? Did you enjoy the class? Are you taking a math class simultaneously with AP Statistics this school year?
3. What AP courses have you taken? How did you do?
4. What do you plan on doing after high school? If it is college, what do you plan on majoring in? Is there a particular place you'd like to go? What is your dream job?
5. Why did you choose this class? Give me at least one example of how you think statistics is used in the real world.

Part 2: Due Monday, **August 13, 2018** (the first day of school). Please email me if you have questions.

1. Below is the list of the ages of the Tampa Bay Rays baseball team:

29, 27, 26, 26, 29, 28, 25, 25, 28, 23, 32, 26, 27, 33, 26, 25, 32, 23, 27, 32,
27, 26, 19, 33, 37, 23, 35, 28, 30, 24, 32, 33, 27, 30, 25, 21, 21, 21, 24, 27, 26.

Answer the following questions based on the above data set. (You may use a graphing calculator)

a. Find the minimum age. _____

b. Find the maximum age. _____

c. Find the median age. _____

d. Find the lower quartile for the ages. _____

e. Find the upper quartile for the ages. _____

f. Draw a box and whisker plot below using your answers for a-e. Don't forget to put a number line below the box and whisker plot.

g. Find the mean age. _____

h. Find the interquartile range (show work). _____

i. Find the range (show work). _____

j. Fill in the following frequency table by counting the ages for each category.

Ages	Tally (Frequency)
19-22	
23-26	
27-30	
31-34	
35-38	

k. Create a histogram using the table you created in j. Don't forget to label your axes and title your graph.

2. Taylor is playing a game using a die and a spinner. The spinner is divided into 4 equal parts with colors green, red, yellow, and purple. Taylor rolls the die and spins the spinner. Show your work.

a. What is the sample space?

b. What is the probability the die shows a 2 and the spinner lands on purple?

c. What is the probability the die shows a number less than 3 and the spinner doesn't land on yellow?

d. What is the probability the die shows a multiple of 3 or the spinner lands on green or red?

3. Kelli is playing a game using two dice. She rolls both dice. Show your work.

a. What is the sample space?

b. What is the probability the first die is a 2 AND the second die is a 5 or 6?

c. What is the probability the first die doesn't show a 2 AND the second die is an odd number?

d. What is the probability the first die shows a number less than 2 OR the second die is a 1 or 6?

e. What is the probability the first die shows a number less than 4 OR the second die shows a multiple of 3?

4. Use the following information to complete the table and determine the missing values. Answers should be in fraction and decimal form.

- 450 Juniors were surveyed
- 425 of the students surveyed play video games
- 275 of the Seniors play video games

	Play Video Games	Play Sports	Total
Juniors			
Seniors			
Total			1000

a. What is the probability a student plays sports?

b. What is the probability a junior plays video games?

c. What is the probability a student is a senior or plays video games?

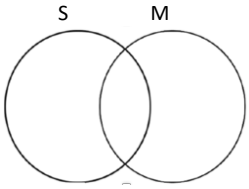
d. What is the probability senior plays video games and sports?

e. What is the probability a student is a junior and plays sports?

f. What is the probability a student who plays video games is a senior?

g. Are the events being a junior and playing video games independent? Use the formal check for independence to make a decision. Formal test of independence: Does P(A) = P(A|B)?

5. Some students like sports and some students like math. The probability a student likes sports is 0.76. The probability a student likes math is 0.16. The probability likes math but not sports is 0.08. Fill in the Venn diagram below.



A student is selected at random. Determine the following probabilities. Show your work where necessary.

a. What is the probability a student likes sports but not math?

b. What is the probability a student likes math and sports?

c. What is the probability a student likes math or sports?

d. What is the probability a student likes neither math nor sports?

e. Are the events liking math and liking sports independent?

6. In studying ocean conditions, the Bureau of Fisheries found that for one location, the August water temperatures (in degrees Fahrenheit) were normally distributed with a mean of 83° and a standard deviation of 2°. (Hint: Use the Empirical Rule)

a. What is the probability that the water temperature is higher than 87°?

b. What is the probability that the water temperature is between 81° and 85°?

c. What is the probability that the water temperature is lower than 85°?

d. The water temperature on August 21 was higher than 99.85% of all other temperatures. What was the water temperature on August 21?

7. Nick scored a 90 on his Calculus Exam. Nick also takes Statistics and also scored a 90 on his Statistics test. The mean for Nick's Calculus class was 85 with a standard deviation of 4 and the mean for Nick's Statistics class was 82 with a standard deviation of 8. On which test did Nick perform better on? (Hint: Compare z-scores to help make your decision.) Show your work.

8. Suppose that you and your friend flip a coin 20 times and you calculate the proportion of tails to be .8. Your partner seems surprised at these results and suspects that the coin is not fair.

a. What is meant by a fair coin?

b. Why should you not just use the sample proportion $\hat{p}$=.8 to decide if the coin is fair or not?

c. Compute the margin of error using the formula: $2\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

d. Using both the sample proportion and the margin of error to write a statement as to whether or not you believe the coin is fair.