

Dear student,

AP Statistics Summer homework

You are receiving this because you signed up to take AP Statistics next year (OR listed it as an alternate). I look forward to meeting you next fall! In the meantime, here is your summer homework assignment:

***Please send me an email ASAP at acrum@everettsd.org, so I can add you to my list and send you updates and reminders this summer... This is the first step of your summer homework. Thanks!**
(While you're at it, ask any questions you have about the assignment below, or about AP Stats in general...)

Goals: Start thinking about data collection and analysis, in preparation for learning the "official" right ways to do it... See for yourself how Stats can be interesting and useful to the average well-educated citizen.

IMPORTANT NOTES:

1. No matter which option you choose, I am not looking for carefully polished AP-English-style essays, even though I know some of you are capable of that. In other words, don't stress yourselves out over this; think "journal entry" not "writing assessment". Your grade is based on your ability to follow the directions below; I'm mainly interested in the content, and I'm looking for evidence that you thought about Statistics a little in advance, and started training your mind to look at the world in terms of data and conclusions that can be made from data.
2. On the other hand, don't dismiss this assignment as unimportant, either... Here's a word about my grading system that will help you out considerably if you take my advice to heart: zeros hurt your grade a LOT, but I don't give them out unless you force me to. In my grading system, a half-hearted effort earns a minimum of 60%, while work that is never turned in at all is (of course) worth zero; I don't believe in anything in-between, except on tests. When you average a bunch of grades together, the effect is that poorly done work will bring your grade down (as you would expect, especially those of you who are horrified at the thought of getting a 60% on anything!), but a zero is much, much worse... (If you don't believe me, try averaging a 90, 80 and 0, compared to a 90, 80, and 60, and ask yourself which grade you'd rather have.) So please turn in something, even if it's only partly done; don't force me to give you a zero on the very first day of school! And if you follow the instructions below, I promise that you'll get more than 60%!

With that in mind, please choose one of the following options, and type your response in a document (such as Word or Google Docs) to be uploaded through Canvas later (due the Monday after school starts).

Option 1: (May involve buying a book, but if you can borrow it from the library, that's great!)

Read a book about Statistics and/or math, and write at least 3 paragraphs about it. I usually read one or more of these every summer, and I enjoy what I learn from them... is that just a sign that I'm a geek, or will others agree, I wonder? Some of them are a lot of reading, so you have permission to skim quickly through any part that seems boring to you, and focus your attention on the parts you find most interesting. Here are some possible books to choose from, more or less in order by how much I like them and think you'll like them. I have donated some of these to the Cascade High School library, so stop by during their summer hours if you can to check one out. And if you buy one and don't want to keep it, let me know, and I might buy it from you to add to my collection...

- *How Not to Be Wrong: The Power of Mathematical Thought*, by Jordan Ellenberg (my favorite)
- *Struck by Lightning: the Curious World of Probabilities*, by Jeffery S. Rosenthal
- *Knock on Wood: Luck, Chance, and the Meaning of Everything*, by Jeffery S. Rosenthal
- *The Improbability Principle: Why Coincidences, Miracles, and Rare Events Happen Every Day*, by David J. Hand
- *How to Lie With Statistics* by Darrell Huff
- *The Lady Tasting Tea: How Statistics Revolutionized Science in the 20th Century* by David Salsburg
- *The Drunkard's Walk: How Randomness Rules Our Lives* by Leonard Mlodinow
- *The Signal and the Noise: Why So Many Predictions Fail—But Some Don't* by Nate Silver
- *How to Explain Almost Everything: The Power of Probability in Everyday Life* by Robert A. Hitlin

Whichever one you choose, write a response to the book: at least three paragraphs, each discussing one of the following ideas or something else relevant that you learned:

- Give the book a rating using the 5-star system, and defend your choice. (1 = I can't believe you made me read this, 5 = This is the greatest book ever, and everyone should read it!) Most people, I predict, will choose something in between, so tell me why you didn't rate it higher or lower. You do NOT have to pretend to like it just for me; don't go on and on about how great it was unless you really mean it!

- Describe one of the repeated themes of the book, and explain how you can apply it to real life.
- Explain a mathematical idea you have changed your opinion about as a result of reading this book. This might be something you knew how to do but had no idea what it was good for (but now you do), or something you had not learned yet, but understand at least partly now because of this book.
- Choose one of the broad topics we'll be studying this year in AP Stats (data analysis, prediction, probability, expected value, inference) and summarize what you've learned in advance about that topic and how it is useful in real life.
- In your own words, retell a story you enjoyed from the book about someone who used mathematics in a creative way for something real and practical. You may need to condense and summarize, especially if you choose a story that is spread out over several chapters...

As you may or may not have noticed, all of these books are about what math is good for in real life, and many of the examples they contain are AP Stats topics! This is part of why I like these books, part of why I like teaching Statistics, and the main reason why reading them is one of your summer homework options.

Option 2: (Free, but requires research either online or in newspapers/magazines/libraries...)

Read at least 5 articles in which data was analyzed and a conclusion was reached. Try to spread them out among different topics (don't choose 3 medical tests of new drugs, for instance). Possible types of studies include:

- A survey which determines that a certain proportion of people do or believe a certain thing.
- A study that shows that people who ___ are more likely to ___.
- An estimate of the mean (average) value of some numerical quantity.
- An experiment in which treatments were assigned to different groups and a conclusion made about the effect of the treatments.
- A study of 2 numerical quantities in which a scatterplot and line of fit were made (or could have been made), a trend was noticed, and a conclusion made about how one quantity influences the other and/or can be used to predict the other.

Choose 3 of the articles you read from DIFFERENT categories above, and write a paragraph for each summarizing what the researchers did well and (if appropriate) what they could have done better.

Things to consider:

- How did they gather their data? How did they make sure it was unbiased?
- What were they hoping to find out? Did the data match their expectations?
- What type of calculations did they do once they had their data? How well did they explain this to the average reader who hasn't studied Statistics (yet)?
- What kinds of graphs or visual displays did they use to support their ideas? Are they new to you, or have you seen them before?
- What did they conclude? How did they defend or support their conclusion?
- Have the researchers convinced you (a reasonably well-educated reader who hasn't learned Statistics yet) that their conclusion is correct? If not, what more information would you need in order to be convinced?

As you have probably guessed, every bullet point above is something we will learn how to do (the right way) this year, but I don't really expect you to know how yet! I'm looking for more of a common-sense approach, and you are welcome to be skeptical and doubt that some advertised claims are true! There are plenty of people out there using statistical language and ideas in order to try to deceive people!

No, I am not going to give you a bunch of links to possible articles... I thought about it, but I really don't want to read the same paragraphs over and over!! And also, I think these will be pretty easy to find in any news source. If you're having trouble, try Googling something basic like "new study finds"...

It's up to you to decide which of the options above looks more easily manageable to you... Or choose the harder one, if it looks more interesting!! Either option is due the Monday after school starts (one week after Labor Day), and you'll submit your document digitally through Canvas (more instructions will be given on the 1st day of school!). Thank you to those of you who read all the way to the end of this! I hope you find this assignment enjoyable and interesting, and not too stressful. Have a great summer!

Mrs. Crum
Soon to be your favorite math teacher ☺