AP STATISTICS SUMMER ASSIGNMENT

A copy of Chapter 1 was emailed to ALL students enrolled in AP Statistics on Friday, July 15th. All summer work questions should be directed to our AP Statistics teacher, Mr. Donnelly, at mark.donnelly@redclay.k12.de.us

Welcome to AP Statistics! I am looking forward to having you in class in the fall. In order to be ready to hit the ground running in September, you have some preliminary work (Chapter 1 in the textbook). The assignment will be collected the first day of class and graded for both completion and accuracy. Please take these assignments seriously, as we will use the material presented in the first chapter throughout the entire course. Though you may email me with questions (mark.donnelly@redclay.k12.de.us), what you turn in is to be YOUR OWN WORK, and any indication of identical commentary or presentation will be treated as a cheating incident. Some general helpful hints:

1) Please read the textbook carefully. This course is based on vocabulary and understanding of concepts (not just calculations) presented in the text, so it should be read and reread to ensure maximum comprehension. If you only skim or skip reading altogether, you will probably miss some detail needed to correctly answer a question. **If you need assistance, Khan Academy is a GREAT resource to help with your understanding of the material.**

2) Use the odd numbered questions to help you answer the assigned even numbered questions. You have been assigned only even-numbered questions (see back), but nearby odd-numbered questions (whose answers are given in the back of the textbook) may provide clues to how to solve your problems.

3) Graphs (any visual display of data) SHOULD BE DONE ON GRAPH PAPER IF THE SCALE IS SIGNIFICANT. If you have a hard copy of this summer assignment, 3 sides of graph paper is attached at the end. Otherwise, let me know if you need graph paper. *Points will be deducted for scaled graphs not done on graph paper.*

4) 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. Often, questions will require you to comment on what your graph tells you (so again, write clearly and in complete sentences when applicable). A pneumonic device that might help you to remember the 4 major areas that need to be addressed when asked to describe your data is "SOCS" (see last written page of summer assignment for specifics). In fact, forgetting any one can be a critical omission! Also, DON'T JUST SPOUT #'s, USE #'sIN CONTEXT (what they mean to that particular problem using appropriate units like feet or $, for example).

5) You may want to make a copy of your summer assignment (for yourself). We will be going over the assignment during the first week of class, but you will not have access to your own work the first few days of class.

6) You will need to have a TI-83/84 (or equivalent) the first week of class; however, it is not necessary to complete the summer assignments.

7) WE WILL HAVE AT LEAST ONE QUIZ (perhaps surprise!) AND A TEST ON THE MATERIAL COVERED IN CHAPTER ONE WITHIN ONE WEEK OF THE START OF SCHOOL.

ASSIGNED PROBLEMS (to be handed in first day of class, NO EXCEPTIONS!!!)
(Starting page for problem groups is given for your convenience)

1) p. 7 (1.2, 1.4)
2) p. 11 (1.6)
3) p. 16 (1.8)
4) p. 23 (1.14)
5) p. 26 (1.16, 1.18)
6) p. 31 (1.20)
7) p. 33 (1.22)
8) p. 34 (1.24, 1.28, 1.30)
9) p. 41 (1.34)
10) p. 47 (1.36, 1.38)
11) p. 52 (1.40ab only)
12) p. 56 (1.44 showing work for a, 1.46)
13) p. 59 (1.48, 1.50)
14) p. 64 (1.58)
15) p. 66 (1.60, 1.64, 1.66, 1.68)
16) Additional problems #1-12 (attached)

Remember, don't start the assignment too late into the summer, or you will feel the effects in grade form and in understanding the necessary concepts for the very first week of AP Statistics!!! Enjoy your summer ...Mr. Donnelly

AP STATS SUMMER ASSIGNMENT (additional problems)

For problems 1-9, I have a data set consisting of 33 whole number observations. Its five-number summary is (min,Q1,med, Q3,max) = (16, 20, 22, 30, 46).

1. What is the range of the data?

2. How many observations are strictly less than 22 (answer should be a range of numbers)?

3. Is it possible that there is no observation equal to 22 (explain *briefly*)?

4. How many observations are strictly less than 20 (answer should be a range of numbers)?

5. Is it possible that there is no observation equal to 20 (explain *briefly*)?

6. Test for outliers **(showing work!).** Are there any outliers?

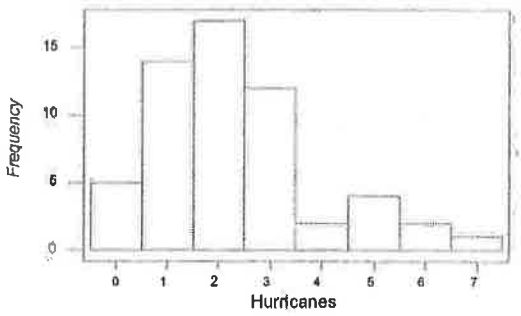
7. Construct a modified boxplot (**on graph paper**).

8. *Approximately* where is the mean (not a specific number!)? Briefly explain your reasoning.

9. What (specifically!) does your boxplot tell you about the spread of the 33 observations in different quartile ranges?

10. You want to measure the physical fitness of students at your school. Suggest **3** variables that you might use to measure fitness. (Be sure that your choices of variables are specific and measurable.)

11. The histogram shows the number of major hurricanes that reached the East Coast of the United States from 1944 to 2000. Describe the shape, center, and spread of the distribution.



12. Hallux abducto valgus (call it HAV) is a deformation of the big toe that is not common in youth and often requires surgery. Doctors used X-rays to measure the angle (in degrees) of deformity in 38 consecutive patients under the age of 21 who came to a medical center for surgery to correct HAV. The angle is a measure of the seriousness of the deformity. Here are the data:

28 32 25 34 38 26 25 18 30 26 28 13 20 21 17 16 21 23 14

32 25 21 22 20 18 26 16 30 30 20 50 25 26 28 31 38 32 21

Make a stemplot (with a key!) and give a numerical description of this distribution. Are there any outliers? Write a brief discussion of the shape, center, and spread of the angle of deformity among young patients needing surgery for this condition.

SUBTLE LESSONS from CHAPTER 1 --"SOCS"

1) SHAPE
   a) can be symmetric, skewed left, or skewed right (or bimodal)
   b) remember to (mentally) remove outliers before commenting on the shape, as outliers should not be the sole reason for a skew (for example, it's better to say "fairly symmetric (without the high outlier)" than "skewed right (because of high outlier)")
   c) don't just state skews; tell what it means in terms of your data in the context of the variable you're measuring
2) OUTLIERS
   a) math MUST be shown even if there are no outliers (it's the only way to judge you ever formally checked!)(Remember: Q3+1.5IQR and Q1-1.5IQR!)
   b) always use modified box plots (showing outliers) over regular boxplots (because outliers are shown!)
3) CENTER
   a) address the center of your data early and specifically in your analysis (graphs and number summaries don't speak for themselves!)
   b) don't just state your mean/median; tell what it says about the central tendencies of your data (in context!)
   c) when the data is skewed, don't use the mean (or standard deviation); the median is the better judge of central number
4) SPREAD
   a) don't just state your 5-number summary (or how they were calculated), but use these numbers to discuss what it means about your data IN THE CONTEXT OF THE PROBLEM ANALYSIS (for example, "an IQR of $2 shows that the middle 50% of the data are relatively compact")
   b) include statements when there are notably different spreads for different quartile ranges, not just the min/max, range, or IQR (for example, " my data is increasingly spread as the number of feet increases" is better than just "the spread is 10 feet")
   c) Q1 and Q3 are numbers, not ranges, so make this distinction in your discussion (for example, say "between the min and Q1", "between Q1 and the median", etc.)
   d) for relatively symmetric data, standard deviation can be used but always with the mean; for relatively skewed data, it's better to use the 5 # summary with the median