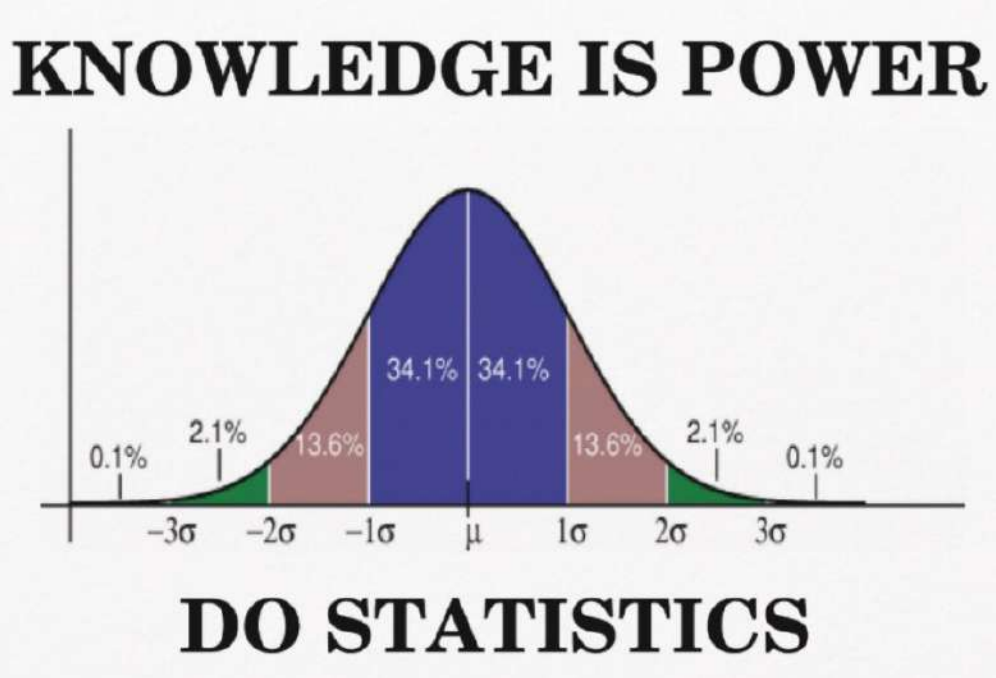
AP Statistics Summer Work '21-'22



Welcome to AP Statistics! Included is information regarding your summer assignment. You will be learning the course material that will correspond to Chapters 1 and 4 in our NEW textbooks. We'll use Khan Academy videos, practice problems, "quizzes", and "unit tests" to help you, and will also practice with some old FRAPPYs (**F**ree **R**esponse **AP** **P**roblem - **Y**ay!).

- Packet due date: First day of school
- Be prepared for a test on this material within the first 2 weeks of school.
- This work will count as a quiz grade, graded for both completeness and accuracy. The Khan Academy "quizzes" are just for practice. Your first attempt at the included Khan Academy "unit tests" will be scored (yes, we can tell).
- Please join our summer Google Classroom.
- Please join AP Stats 21-22 on Khan Academy by visiting www.khanacademy.org/join and entering code.

If you have any questions while completing your work, please email Mrs. Stevens (stevens.suzanne@rvilleschools.org)

Chapter 4: Collecting Data (We must know how to collect data before we learn what to do with it!)

Part 1: Complete the "Study Design" unit on Khan Academy.
It includes 4 lessons with several videos and practice problems included in each one. There are also 2 quizzes; these are not scored for points. There are many

versions of these quizzes, so you can take them as many times as you'd like if you feel you need more practice. There is also a Unit Test (9 questions); your <u>first</u> attempt at this unit test will be graded. It's very easy for us to see how many attempts you made, when you made them, and your score on each one!!

Part 2: Complete the two FRAPPYs below. They are released problems from previous years' AP Statistics Exam.

Chapter 4 "FRAPPY"

{Free Response AP Problem...Yay!}

The following problem is taken from an actual Advanced Placement Statistics Examination. Your task is to generate a complete, concise statistical response in 15 minutes (or less). You will be graded based on the AP rubric. After grading,
keep this problem in your files for your AP Exam preparation.

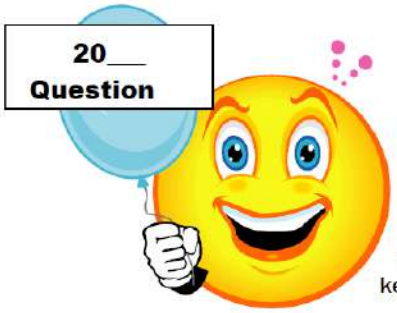
1. An apartment building has nine floors and each floor has four apartments. The building owner wants to install new carpeting in eight apartments to see how well it wears before she decides whether to replace the carpet in the entire building. The figure below shows the floors of apartments in the building with their apartment numbers. Only the nine apartments indicated with an asterisk (*) have children in the apartment.

11* 12 1st Floor 14 13	21 22* 2nd Floor 24 23*	31 32 3rd Floor 34 33
41 42 4th Floor 44 43	51* 52 5th Floor 54 53	61 62 6th Floor 64 63
71 72 7th Floor 74* 73*	81 82 8th Floor 84* 83	91 92* 9th Floor 94 93*

* = Children in the apartment

(a) For convenience, the apartment building owner wants to use a cluster sampling method, in which the floors are clusters, to select the eight apartments. Describe a process for randomly selecting eight different apartments using this method.

(b) An alternative sampling method would be to select a stratified random sample of eight apartments, where the strata are apartments with children and apartments with no children. A stratified random sample of size eight might include two randomly selected apartments with children and six randomly selected apartments with no children. In the context of this situation, give one statistical advantage of selecting such a stratified sample as opposed to a cluster sample of eight apartments using the floors as clusters.



Chapter 4 "FRAPPY"

{Free Response AP Problem...Yay!}

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2. As part of its twenty-fifth reunion celebration, the class of 1988 (students who graduated in 1988) at a state university held a reception on campus. In an informal survey, the director of alumni development asked 50 of the attendees about their incomes. The director computed the mean income of the 50 attendees to be $189,952. In a news release, the director announced, "The members of our class of 1988 enjoyed resounding success. Last year's mean income of its members was $189,952!"

(a) What would be a statistical advantage of using the median of the reported incomes, rather than the mean, as the estimate of the typical income?

(b) The director felt the members who attended the reception may be different from the class as a whole. A more detailed survey of the class was planned to find a better estimate of the income as well as other facts about the alumni. The staff developed two methods based on the available funds to carry out the survey.

Method 1: Send out an e-mail to all 6,826 members of the class asking them to complete an online form. The staff estimates that at least 600 members will respond.

Method 2: Select a simple random sample of members of the class and contact the selected members directly by phone. Follow up to ensure that all responses are obtained. Because method 2 will require more time than method 1, the staff estimates that only 100 members of the class could be contacted using method 2.

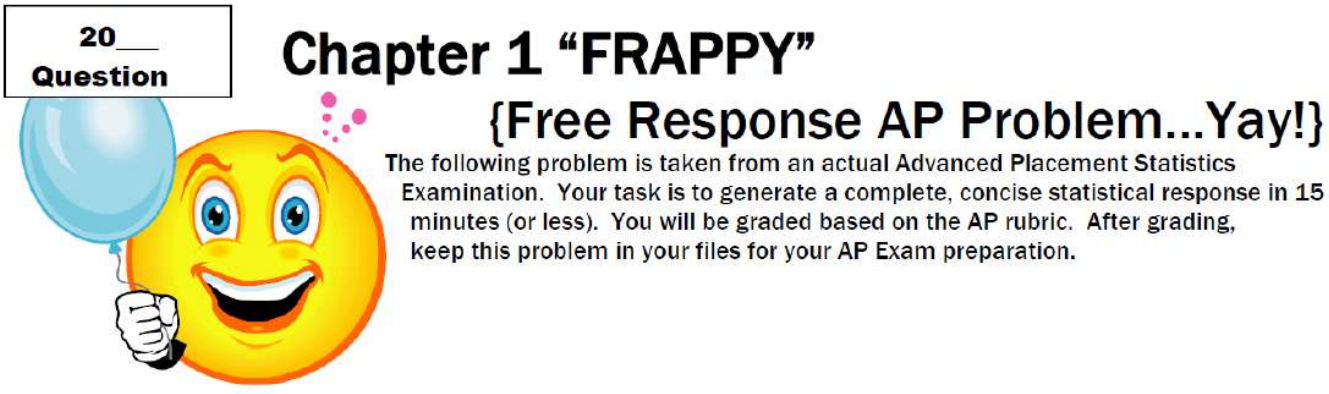
Which of the two methods would you select for estimating the average yearly income of all 6,826 members of the class of 1988? Explain your reasoning by comparing the two methods and the effect of each method on the estimate.

Chapter 1: Data Analysis (Let's learn how to display data!)

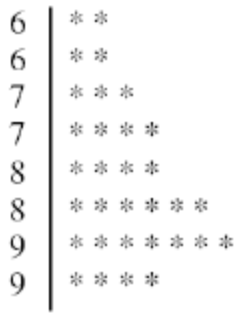
Part 1: Complete the units below on Khan Academy. Each one contains 3 or 4 lessons with several videos and practice problems included within each one. There are also 2 or 3 quizzes in each unit; these are not scored for points. There are many versions of these quizzes, so you can take them as many times as you'd like if you feel you need more practice. There is also a 9 question Unit Test for each unit; your first attempt at each unit test will be graded. It's very easy for us to see how many attempts you made, when you made them, and your score on each one!!

- **Analyzing categorical data** (these are the assignments "due" July 28)
- **Displaying and describing quantitative data** ("due" August 18)
- **Summarizing quantitative data** ("due" September 3)

Part 2: Complete the two FRAPPYs below. They are released problems from previous years' AP Statistics Exam.



3. The graph below displays the scores of 32 students on a recent exam. Scores on this exam ranged from 64 to 95 points.



(a) Describe the shape of this distribution.

(b) In order to motivate her students, the instructor of the class wants to report that, overall, the class's performance on the exam was high. Which summary statistic, the mean or the median, should the instructor use to report that overall exam performance was high? Explain.

(c) The midrange is defined as $\frac{maximum + minimum}{2}$. Compute this value using the data on the preceding page.

Is the midrange considered a measure of center or a measure of spread? Explain.

20___
Question

Chapter 1 "FRAPPY"

{Free Response AP Problem...Yay!}

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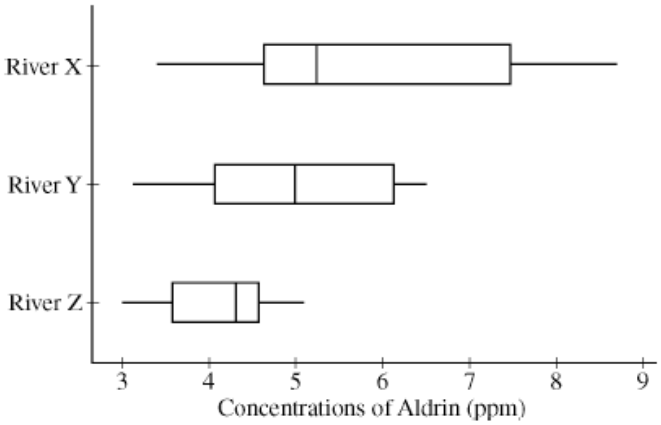
4. As a part of the United States Department of Agriculture's Super Dump cleanup efforts in the early 1990s, various sites in the country were targeted for cleanup. Three of the targeted sites - River X, River Y, and River Z - had become contaminated with pesticides because they were located near abandoned pesticide dump sites. Measurements of the concentration of aldrin (a commonly used pesticide) were taken at twenty randomly selected locations in each river near the dump sites. The boxplots shown below display the five-number summaries for the concentrations, in parts per million (ppm) of aldrin, for the twenty locations that were sampled in each of the three rivers.



(a) **Compare** the distributions of the concentration of aldrin among the three rivers.

The twenty concentrations of aldrin for River X are given below.

3.4	4.0	5.6	3.7	8.0	5.5	5.3	4.2	4.3	7.3
8.6	5.1	8.7	4.6	7.5	5.3	8.2	4.7	4.8	4.6

(b) Construct a stemplot that displays the concentrations of aldrin for River X.

(c) Describe a characteristic of the distribution of aldrin concentrations in River X that can be seen in the stemplot but cannot be seen in the boxplot.