Welcome to AP Stats future statisticians!
To be effective, you must have mastered the concepts through Algebra II and must be comfortable with the tools you will use throughout the year. The use of a TI-83 or higher calculator is required to complete much of the work in the class, so it is in your best interest to acquire a suitable calculator of your own. I would recommend purchasing a Texas Instruments calculator as opposed to any other brand.

Directions:

1. Do not wait until the last minute to complete this packet, instead, pace yourself throughout the summer and complete this over an extended period of time.

2. You will use a free online Stats tutoring site that will give you information on variable and data displays. While reviewing the information on the website, complete the vocabulary section of this packet.
   - Go to www.stat trek.com
   - On the left side of the website, select ‘AP Statistics’ under ‘Tutorials.’
   - Then, click ‘Begin lesson 1.’
   - On the left side of the screen is a list of general topics. Under each general topic are a list of subtopics.
   You will read the following subtopics to complete the vocab list:

<table>
<thead>
<tr>
<th>General Topic: Exploring Data</th>
<th>Subtopics:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Vs. Sample</td>
<td>Variables</td>
</tr>
<tr>
<td>Central Tendency</td>
<td></td>
</tr>
<tr>
<td>Variability</td>
<td></td>
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<tr>
<td>Position</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>General Topic: Charts and Graphs</th>
<th>Subtopics:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patterns in data</td>
<td>Charts and Graphs</td>
</tr>
<tr>
<td>Dotplots</td>
<td></td>
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<tr>
<td>Histograms</td>
<td></td>
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<tr>
<td>Stemplots</td>
<td></td>
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<tr>
<td>Boxplots</td>
<td></td>
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<tr>
<td>Scatterplots</td>
<td></td>
</tr>
<tr>
<td>Comparing Data Sets</td>
<td></td>
</tr>
</tbody>
</table>

3. After reading all of the material, complete the practice problems. Complete each part of each problem and construct all data displays neatly.

4. Turn this packet in at registration. If the packet is not turned in, then you will be removed from the course.

Registration dates for 2020-2021
Please turn in your summer work on registration day, which are as follows:
10th grade – Class of 2023: Registration – Friday, August 7, 2020 – 12:30 pm – 3:00 pm
11th grade – Class of 2022: Registration – Friday, August 7, 2020 – 7:45 am – 11:00 am
12th grade – Class of 2021: Registration – Thursday, August 6, 2020 – 12:00 pm – 3:00 pm
***Makeup Registration Wednesday, August 12, 2020 – 8 am – 12:30 pm ***

If you are not be able to make registration, please email the summer work to CulverHighsummerwork@ccusd.org.
Please place your full name and the subject in the subject line.

Good luck, and see you on the first day of school!
AP Statistics Summer Assignment

Part 1: Vocabulary List

Please define each of the following terms from the information on the stattrek website. When asked provide a UNIQUE example or sketch of the word... One NOT given on the website and Not the one your friends use.

1. Categorical Variables
   
   Example:

2. Quantitative Variables
   
   Example:

3. Discrete Variables

4. Continuous

5. Univariate Data

6. Bivariate Data

7. Population
   
   Example:

8. Sample
   
   Example:
9. Median

10. Mean

   Formula:

11. Outlier

12. Parameter

13. Statistics

14. Range

15. Standard Score (z-score)

   Formula:

16. Center

17. Spread

18. Variance:

   Formula:
19. Standard Deviation

Formula:

20. Symmetry

Sketch:

21. Unimodal

Sketch:

22. Bimodal

Sketch:

23. Skewness

Sketch Skewed left:

Sketch Skewed right:

24. Uniform

Sketch

25. Gaps

Sketch:

26. Outliers

Sketch:
27. Dot plots

28. Bar chart

29. Histogram

30. Difference between bar chart and histogram

31. Stemplots

32. Boxplots

33. Quartiles

34. Range

35. Interquartile Range

36. Four ways to describe data sets

37. Types of graphs that can be used for comparing data
CATEGORICAL OR QUANTITATIVE
Determine if the variables listed below are quantitative or categorical.

1. Time it takes to get to school
2. Number of people under 18 living in a household
3. Hair color
4. Temperature of a cup of coffee
5. Teacher salaries
6. Gender
7. Smoking
8. Height
9. Amount of oil spilled
10. Age of Oscar winners
11. Type of Depression medication
12. Jellybean flavors
13. Country of origin
14. Type of meat
15. 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 below on the number of home runs Mark McGuire hit in each season from 1982 – 2001.

<table>
<thead>
<tr>
<th>70</th>
<th>52</th>
<th>22</th>
<th>49</th>
<th>3</th>
<th>32</th>
<th>58</th>
<th>39</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>65</td>
<td>42</td>
<td>29</td>
<td>9</td>
<td>32</td>
<td>9</td>
<td>33</td>
</tr>
</tbody>
</table>

- Mean
- Minimum
- Maximum
- Median
- Q1
- Q3
- Range
- 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, 10,163 from poisoning, 4051 from drowning, and 3601 from fires. The rest were listed as “other” causes.

a. Find the percent of accidental deaths from each of these causes, rounded to the nearest percent.

b. What percent of accidental deaths were from “other” causes?

c. NEATLY create a well-labeled bar graph of the distribution of causes of accidental deaths. Be sure to include an “other causes” bar.

d. A pie chart is another graphical display used to show all the categories in a categorical variable relative to each other. Create a pie chart for the accidental death percentages. You may try using a software or internet source to make one and paste in the space below. (*Microsoft Excel works well*)
SHOPPING SPREE!
A marketing consultant observed 50 consecutive shoppers at a supermarket. One 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:

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

a. Make a stemplot using tens of dollars as the stem and dollars as the leaves. Make sure you include appropriate labels, title and key.
WHERE DO OLDER FOLKS LIVE?
This table gives the percentage of residents aged 65 or older in each of the 50 states.

<table>
<thead>
<tr>
<th>State</th>
<th>Percent</th>
<th>State</th>
<th>Percent</th>
<th>State</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>13.1</td>
<td>Louisiana</td>
<td>11.5</td>
<td>Ohio</td>
<td>13.4</td>
</tr>
<tr>
<td>Alaska</td>
<td>5.5</td>
<td>Maine</td>
<td>14.1</td>
<td>Oklahoma</td>
<td>13.4</td>
</tr>
<tr>
<td>Arizona</td>
<td>13.2</td>
<td>Maryland</td>
<td>11.5</td>
<td>Oregon</td>
<td>13.2</td>
</tr>
<tr>
<td>Arkansas</td>
<td>14.3</td>
<td>Massachusetts</td>
<td>14.0</td>
<td>Pennsylvania</td>
<td>15.9</td>
</tr>
<tr>
<td>California</td>
<td>11.1</td>
<td>Michigan</td>
<td>12.5</td>
<td>Rhode Island</td>
<td>15.6</td>
</tr>
<tr>
<td>Colorado</td>
<td>10.1</td>
<td>Minnesota</td>
<td>12.3</td>
<td>South Carolina</td>
<td>12.2</td>
</tr>
<tr>
<td>Connecticut</td>
<td>14.3</td>
<td>Mississippi</td>
<td>12.2</td>
<td>South Dakota</td>
<td>14.3</td>
</tr>
<tr>
<td>Delaware</td>
<td>13.0</td>
<td>Missouri</td>
<td>13.7</td>
<td>Tennessee</td>
<td>12.5</td>
</tr>
<tr>
<td>Florida</td>
<td>18.3</td>
<td>Montana</td>
<td>13.3</td>
<td>Texas</td>
<td>10.1</td>
</tr>
<tr>
<td>Georgia</td>
<td>9.9</td>
<td>Nebraska</td>
<td>13.8</td>
<td>Utah</td>
<td>8.8</td>
</tr>
<tr>
<td>Hawaii</td>
<td>13.3</td>
<td>Nevada</td>
<td>11.5</td>
<td>Vermont</td>
<td>12.3</td>
</tr>
<tr>
<td>Idaho</td>
<td>11.3</td>
<td>New Hampshire</td>
<td>12.0</td>
<td>Virginia</td>
<td>11.3</td>
</tr>
<tr>
<td>Illinois</td>
<td>12.4</td>
<td>New Jersey</td>
<td>13.6</td>
<td>Washington</td>
<td>11.5</td>
</tr>
<tr>
<td>Indiana</td>
<td>12.5</td>
<td>New Mexico</td>
<td>11.4</td>
<td>West Virginia</td>
<td>15.2</td>
</tr>
<tr>
<td>Iowa</td>
<td>15.1</td>
<td>New York</td>
<td>13.3</td>
<td>Wisconsin</td>
<td>13.2</td>
</tr>
<tr>
<td>Kansas</td>
<td>13.5</td>
<td>North Carolina</td>
<td>12.5</td>
<td>Wyoming</td>
<td>11.5</td>
</tr>
<tr>
<td>Kentucky</td>
<td>12.5</td>
<td>North Dakota</td>
<td>14.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Histograms are a way to display groups of quantitative data into bins (the bars). These bins have the same width and scale and are touching because the number line is continuous. To make a histogram, you must first decide on an appropriate bin width and count how many observations are in each bin. The bins for percentage of residents aged 65 or older have been started below for you.

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a. Finish the chart of Bin widths and then create a histogram using those bins on the grid below. Make sure you include appropriate labels, title and scale.
SSHA SCORES
Here are the scores on the Survey of Study Habits and Attitudes (SSHA) for 18 first-year college women:
154 109 137 115 152 140 154 178 101 103 126 126 137 165 165 129 290 148

and for 20 first-year college men:
108 140 114 91 180 115 126 92 169 146 109 132 75 88 113 151 70 115 187 104

a. Put the data values in order for each gender. Compute numeral summaries for each gender.

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>Minimum</td>
<td>Minimum</td>
</tr>
<tr>
<td>Q1</td>
<td>Q1</td>
</tr>
<tr>
<td>Median</td>
<td>Median</td>
</tr>
<tr>
<td>Q3</td>
<td>Q3</td>
</tr>
<tr>
<td>Maximum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Range</td>
<td>Range</td>
</tr>
<tr>
<td>IQR</td>
<td>IQR</td>
</tr>
</tbody>
</table>

b. Using the minimum, Q1, Median, Q3, and Maximum from each gender, make parallel boxplots to compare the distributions.
You are expected to have a basic understanding of simple probability. If you find these problems "less than intuitive", there are numerous sites available online that provide basic probability explanations.

1. A special lottery is to be 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. $\frac{1}{2}$

2. Which of the following has 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.

3. If a coin is tossed twice, what is the probability that on the first toss the coin lands heads and on the second toss the coin lands tails? (Hint: What are the possible outcomes when you toss a coin twice?)

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

4. 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

5. Calculate the following probabilities and arrange them in order from least to greatest.
   I. The probability that a fair die will produce an even number. __________
   II. A random digit from 1 to 9 (inclusive) is chosen, with all digits being equally likely. The probability that when it's squared the answer will contain the digit 1. __________
   III. The probability that a letter chosen from the alphabet will be a vowel. __________
   IV. A random number between 1 and 26 (inclusive) is chosen. The probability that its square root will not be an integer. __________

ORDER: __________, __________, __________, __________