Welcome to AP Statistics! I’m looking forward to a great year with all of you! As with all AP classes, you are going to do some work this summer in order to better prepare you for the year ahead.

Statistics is unlike any other math class that you’ve taken in the past. It requires a considerable amount of reading comprehension as well as writing skills. You must be able to **think, reason, explain and support** as opposed to performing rudimentary computations. The other purpose of this assignment is to see if you are ready for the workload. This packet should take a few hours depending on how fast you work and how well you remember these topics. It is expected that sometime in the next two and a half months that you do this work. If you choose not to, it is an indication that you are not ready for the workload of this AP class. The summer assignment is composed of **three parts** in order to give you an idea of the type of work you are going to be doing next year.

1. **Reading and Vocabulary:**

You will use a free online Statistics tutoring site that will give you information on variables and data displays. While reviewing the information on the site you will be completing a vocabulary list. Follow the steps below:

 Go to www.stattrek.com

 Click on “AP Statistics” then “AP Tutorial”

 On the left side of the screen is a list of general topics. Under each general topic is a list of subtopics. You will read the following subtopics and watch the videos (each is only a few minutes) to complete the vocabulary list attached.

1. **Practice what you’ve learned!**

Complete the rest of this packet. Practice is going to be key in your understanding of Statistics!

1. **Prepare yourself for your first flipped classroom unit.**

Throughout the year, you will be required to watch lessons at home. The reason for this is so that we can have more time in class to discuss practice problems. Your first “flipped lessons” will be at the following link: <https://sites.google.com/site/mrmayshasflipped/>

 From there, click on the following: “AP Stats Flipped Lectures”

The two sections you will be responsible for are “Chapter 12 – Sample Surveys” and “Chapter 13 – Experiments and Observational Studies”

For each section:

1. Take notes on the web page.
2. Watch the videos and take notes on them

**\*\*That’s it!! See you in the fall!!\*\***

**Some important information**

**Help with work:**

If you have trouble with **anything** you should do whatever you need to do in order to understand and complete the problems. This can include contacting your classmates, looking up topics on the internet, and emailing me. My personal email is **bwaj1711@gmail.com** and it will be checked almost daily throughout the summer. Don’t hesitate to ask!

**Due Date**

**The Thursday/Friday of the first full week of school**

**Grading**

 This assignment will be your first grade of the year and ***you will be tested on the material in this packet*** on the day the assignment is due.

**Calculator**

 If you do not have a TI calculator, you have a few options:

Go to <http://wabbit.codeplex.com/> and download a TI-84 plus to your computer. There is also a wabbitemu app for anyone with an Android.

**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**

**11. Outlier**

**12. Parameter**

**13. Statistics**

**14. Range**

**15. Standard Score (z-score)**

 Formula:

**16. Center**

**17. Spread**

**18. Variance**

**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**

**26. Outliers**

**27. Dot plots**

**28. Bar Chart**

**29. Histogram**

**30. Difference between bar chart and histogram**

**31. Stem plots**

**32. Box plots**

**33. Quartiles**

**34. Range**

**35. Interquartile Range**

**36. Four Ways to Describe Data Sets**

**37. Types of Graphs that can used for comparing data**

**Practice Problems:**

1. In a study designed to determine the average death age reported for the population of a major U.S. city, a statistician randomly selected 37 obituaries from the city’s largest newspaper. The sample consists of 18 males (DAgeM) and 19 females (DAgeF). (4pts each)



a. Use the data to create each of the displays below. Be sure to clearly label and scale all axes.

i. Parallel box plots

ii. Two histograms

iii. Back-to-back stem plot (include a key)

b. Write a few sentences comparing the two distributions. Provide insight on the similarities and/or differences.

c. Are there any outliers in your data? How can you tell?

2. The data below is the 1994 baseball salaries for the Angels.

**ANGELS**

Player Position Salary ($)

|  |  |  |
| --- | --- | --- |
| C. Finley | P | 3,875,000 |
| M. Langston | P | 3,550,000 |
| C. Davis | Of | 2,400,000 |
| J. Magrane | P | 1,500,000 |
| S. Owen | Ss | 1,250,000 |
| B. Jackson | Of | 1,000,000 |
| J.Grahe | P | 925,000 |
| D. Smith | Of | 700,000 |
| G. Myers | C | 700,000 |
| C. Curtis | Of | 600,000 |
| T. Saimon | Of | 600,000 |
| G. DiSarcina | Ss | 400,000 |
| J. Dopson | P | 400,000 |
| C. Leflerts | P | 400,000 |
| B. Panerson | P | 400,000 |
| M. Leiter | P | 300,000 |
| R. Hudler | Lf | 275,000 |
| H. Reynolds | 2b | 230,000 |
| B. Sampan | P | 225,000 |
| D. Easley | Ss | 170,000 |
| S. Lewis | P | 155,000 |
| M. Butcher | P | 150,000 |
| E. Perez | 1b | 135,000 |
| C. Turner | Pc | 125,000 |
| J. Edmonds | Of | 117,500 |
| P. Leftwich | P | 109,000 |

Enter the salaries into a list in your calculator. Use the 1-Var Stats command on your calculator to answer each of the following: (2pts each)

(a) What is the mean/average salary? (b) What is the minimum salary?

(c) What is the maximum salary? (d) What is the median salary? (e) What is the value of Q1? (f) What is the value of Q3? (g) Find the interquartile range. (h) Find the range. (i) Find the mode(s).

Bonus: What is the standard deviation of the data?

(j) Now, suppose that the Angels traded for three superstars, each making $3,000,000/yr. These superstars

replace the players with the lowest salaries on the team. **Recalculate** the mean, median and mode. Write a few sentences to compare the new statistics with the original ones. Be specific.

3. A **scatterplot** is a good way to investigate an association between two *quantitative* (numerical) variables. A point on the graph represents the combination of measurements for an individual observation.

The following table shows sex, height (inches), and mid-parent height (inches) for a sample of 18 college students. The variable mid-parent height is the average of mother’s height and father’s height. (4pts each)

(a) In the relationship between height and mid-parent height, which variable is the

|  |  |  |
| --- | --- | --- |
| Sex | Height | Mid-ParentHeight |
| M | 71 | 64.0 |
| F | 60 | 63.5 |
| F | 66 | 67.0 |
| M | 70 | 64.5 |
| F | 65 | 65.5 |
| F | 66 | 69.5 |
| M | 74 | 72.5 |
| F | 67 | 67.5 |
| F | 63 | 65.5 |
| M | 67 | 64.0 |
| F | 69 | 70.0 |
| M | 65 | 63.0 |
| M | 72 | 69.0 |
| M | 68 | 67.0 |
| F | 63 | 63.0 |
| F | 61 | 63.0 |
| M | 74 | 69.5 |
| F | 65 | 67.5 |

**response variable** (*y*) and which is the **explanatory variable** (*x*)?

(b) Use your calculator to draw a scatterplot of the data for the *y* and *x* variables defined in part (a). Draw the scatterplot in the space below using different symbols for males and females. Label & scale your axes.

(c) Does the association between height and mid-parent height appear to be linear? What are the differences between the males and females?

(d) Use the LinReg command on your calculator to find the regression line (y = a + bx) for the data points. Record ***r*** for future use. ( If your calculator does not report an r value do the following: 1) select 2nd catalog 2) arrow down to DiagnosticOn 3) hit enter twice 4) run regression again )

(e) What is the slope? What is the y-intercept? **Interpret** the slope and the y-intercept in the context of height and mid- parent height?

4. You must be very familiar with a standard deck of cards. If you are not familiar, you need to become familiar before the first day of class. (1pt each)

(a) How many cards are in a standard deck? (b) How many hearts are in a deck of cards? (c) How many kings?

(d) How many red tens?

(e) How many ace of spades?

(f) What is the probability of being dealt a black 8? (g) What is the probability of being dealt a jack?

(h) What is the probability of being dealt a face card with a value of 4 in a game of blackjack?

(i) When drawing two cards, the first card is a seven. If you don’t replace the card, what is the probability the second card will be a three?

(j) When drawing two cards, the first card is a seven. If you do replace the card, what is the probability the second card will be a three?

5. In football, the referee tosses a coin to determine if a team will receive or kick off. What is the probability that a team will win the toss?

6. What does it mean if you take the SAT and the results show that you are in the 85th percentile?

 7. When rolling two fair standard six sided dice, what sum is most likely?

8. What type of activities are you involved in both inside and outside of school?

9. What is your first choice for college and your proposed major?

10. Is this your first AP class? If not, what others have you taken and how did you do on the AP exam?

11. List the other AP classes you will be taking this year.

12. Why did you choose this class AND what are your expectations for this course?

13. What do you do to study for a math test? Please be as specific as possible in your answer.