AP Statistics Summer Work

Welcome to AP Statistics! The purpose of this assignment is to make you more comfortable with exploring data analysis. Do not be overwhelmed with the size of this packet—there is AMPLE space for you to show your work on this packet. ☺

The summer assignment is composed of two parts:
1. Reading and Vocabulary: You will use a free online Statistical tutoring site that will give your information on variable and data displays. While reviewing information on the site, you will be completing a vocabulary list. Follow the steps below:
    a. Go to www.stattrek.com
    b. Click on "AP Statistics" then "AP Tutorial"
    c. 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 vocabulary list.

General Topic: Exploring Data	
Subtopics:	Variables
	Population vs. Sample
	Central Tendency
	Variability
	Position
General Topic: Charts and Graphs	
Subtopics:	Charts and Graphs
	Patterns in Data
	Dotplots
	Histograms
	Stemplots
	Boxplots
	Scatterplots
	Comparing Data Sets

2. Practice Problems: After reading all the material above, you should be able to complete the questions in the remaining pages of this packet. You should do so on the space provided.

Extra Notes: A graphing calculator is a required tool for this course. The TI-84 is recommended. As you complete the practice problems, reference the skills below to assist you.

One Variable Data

Function	When to use it	Input Command
1-Var Stats (STAT, CALC)	To find mean, standard deviation, and 5 number summary for a data set.	Enter data in L_1 and frequency in L_2 if needed 1-Var Stats L_1 or 1-Var Stats L_1,L_2

Two Variable Data

Function	When to use it	Input Command
LinReg (a + bx) (STAT, CALC) DiagnosticOn	To find the equation for a least squares regression line. To find r and r^2.	Enter values in L_1 (explanatory) Enter values in L_2 (response) LinReg (a + bx) L_1,L_2

A graphing calculator is a required tool for this course. The TI-84 Plus or the TI-84 Plus CE are the recommended calculators. As you complete the practice problems refer to the TI Guidebooks to become familiar with the list and statistical functions. For an online calculator go to www.alcula.com/calculators/statistics

This packet should be completed by the first day of school. You are expected to

complete each part of each problem and to construct all data displays neatly. **This assignment will be**

graded as a test grade.

Here is a suggested timeline for completing the packet.

• Week 1: June 19 – June 23

      o Vocabulary List, Words 1-8

• Week 2: June 26 – June 30

      o Vocabulary List, Words 9-16

• Week 3: July 3 – July 7

      o Vocabulary List, Words 17-24

• Week 4: July 10 – July 14

      o Vocabulary List, Words 25 - 32

• Week 5: July 17 – July 21

      o Vocabulary List, Words 33 – 36, Practice Problems "Categorical or Quantitative",

      "Statistics – What is that?"

• Week 6: July 24 – July 28

      o Practice Problems "Actual Candy Percentages", "It's a Twister", "Shopping Spree"

• Week 7: July 31 – August 4

      o Practice Problems "Where do the older folks live?", "SSHA Scores"

If you have any questions, you can email me at kolton.begley@knoxschools.org. Please know it may

take 48 hours to receive a response in the summer, and I will not be able to answer email

from June 24 to June 30. Good luck!

Part 1: Vocabulary List

Please define each of the following terms from the information on the stattrek website. When asked to provide a UNIQUE example or sketch of the word, provide one that is not on the website and not one that your friends use ☺

Word/Definition	Example/Picture/Formula
Categorial Variables	
Quantitative Variables	
Discrete Variables	
Continuous Variables	

Univariate Data	
Bivariate Data	
Population	
Sample	

Median	
Mean	
Outlier	
Parameter	

Statistic	
Range	
Standard Score (z-score)	
Center	

Spread	
Variance	
Standard Deviation	
Symmetry	

Unimodal	
Bimodal	
Skewness (Left vs. Right)	
Uniform	

Gaps	
Dotplots	
Bar Chart	
Histogram	

Difference Between a Bar Chart and Histogram	
Stemplot	
Boxplots	
Quartiles	

Range	
Interquartile Range	
Four ways to describe data sets	
Types of Graphs that can be used for comparing data	

Part Two: Practice Problems

Categorical or Quantitative
Determine if the variables listed below area 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. Height
6. Amount of oil spilled
7. Age of Oscar winners
8. Jellybean flavors
9. Country of origin
10. Number of pairs of shoes owned

Statistic – What is that?
A statistic is a number calculated from a sample of data. Quantitative data has many different statistics that can be calculated. Determine the given statistics from the data below on the number of homeruns Mark McGuire hit in each season from 1982-2001.

| 70	52	22	49	3	32	58	39
39	65	42	29	9	32	9	33

Mean	
Minimum	
Maximum	
Median	
Q1	
Q3	
Range	
Interquartile Range (IQR)	

Actual Candy Percentages

Suppose that you were interested in the actual percentage of each flavor skittle that was in a bag. To do this, you decide to purchase 5 bags of skittles and count how many of each flavor was in each bag (before enjoying them, of course!) You found that there are 176 green apple, 123 strawberry, 225 grape, 252 lemon, and 237 orange.

1. Find the percent of color of skittles from the total amount in your 5 bags, rounded to the nearest percent.

2. NEATLY created a well-labeled bar graph of the distribution of colors of skittles.
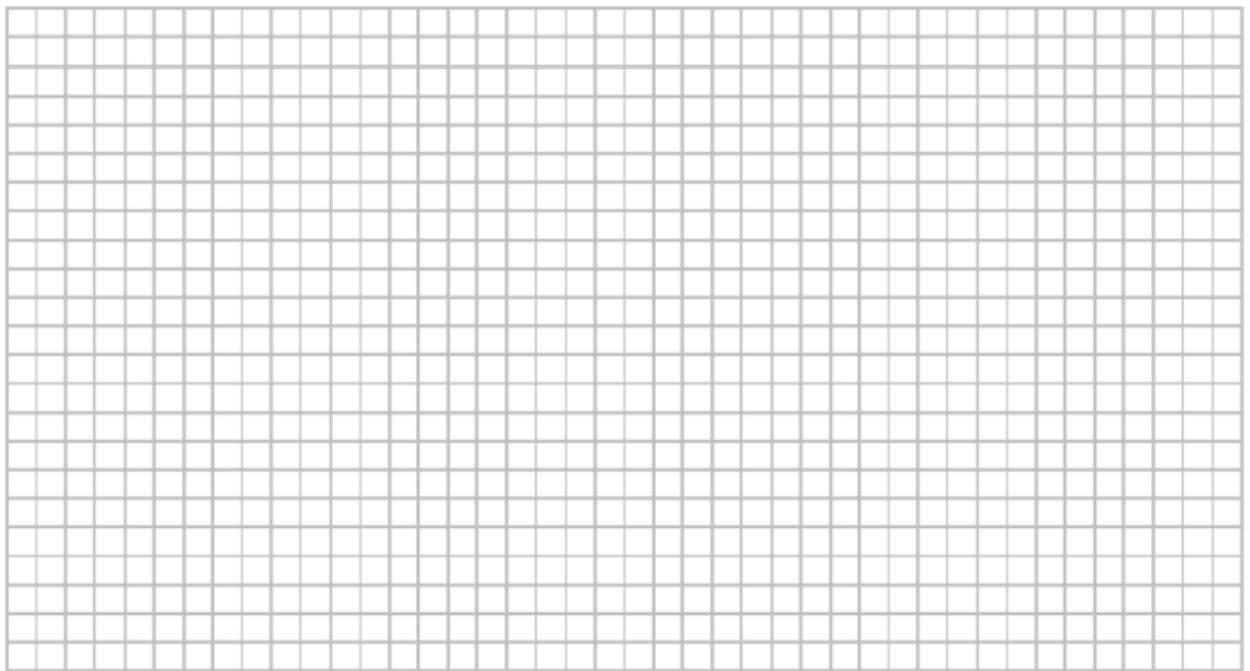
3. A pie chart is another graphical display used to show all the categories in a categorial variable relative to each other. Create a pie chart for colors of skittles.

It's a Twister!

The data below give the number of hurricanes that happened each year from 1944 through 2000 as reported by *Science* magazine.

3	2	1	4	3	7	2	3	3	2	5	2	2	4	2	2	6	0	2	5	1	3	1	0
3	2	1	0	1	2	3	2	1	2	2	2	3	1	1	1	3	0	1	3	2	1	2	1
1	0	5	6	1	3	5	3																

1. Make a dotplot to display these data. Make sure you include appropriate label, title, and scale. The graph paper below should help to ensure you space your markings consistently.
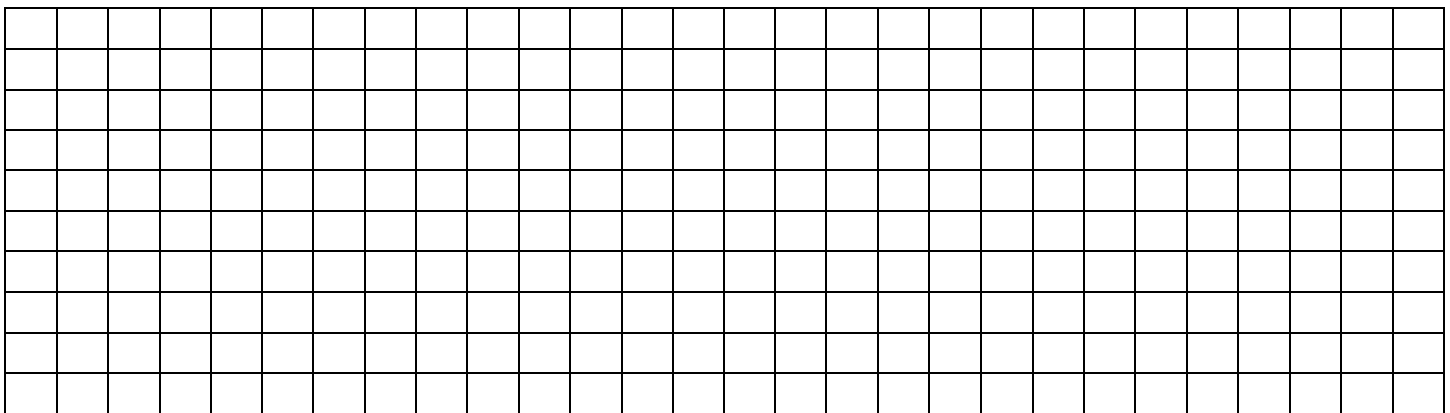
Shopping Spree

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 (rounded to the nearest dollar), arranged in increasing order.

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

1. 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 the older folks live?

This table gives the percentage of residents aged 65 or older in each of the 50 states.

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

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.

1. Finish the chart of bin width and then create a histogram using those bins on the grid below. Make sure you include appropriate labels, title, and scale.

Bin Widths	Frequency
4 to <6	1
6 to <8	
8 to <10	
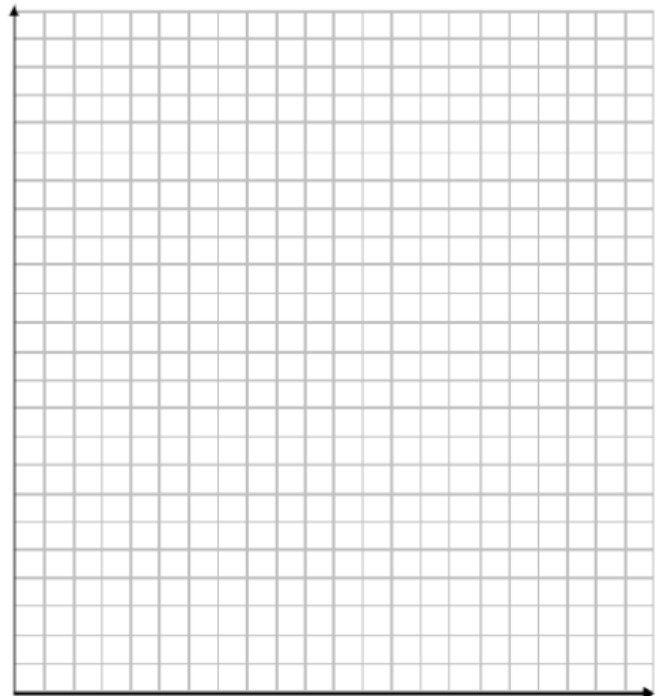
SSHA Scores

Here are the scores on the Survey of Study Habits and Attitudes for first year college students.

154	109	137	115	140	154	101	103	126
137	165	165	129	200	148	152	178	126

Here are the scores on the Survey of Study Habits and Attitudes for third year college students.

108	151	140	70	114	115	91	187	180	104
115	126	92	169	146	109	132	75	88	113

1. Put the data values in ascending order for each group above. Compute numerical summaries for each group.

First Year Students			Third Year Students	
Mean			Mean	
Minimum			Minimum	
Q1			Q1	
Median			Median	
Q3			Q3	
Maximum			Maximum	
Range			Range	
IQR			IQR	

2. Using the minimum, Q1, Median, Q3, and Maximum from each group of students, make parallel boxplots to compare the distributions.