Class Survey Project   Name _____

For this project you will begin analyzing the data that we did in the school survey.

You will need assignments from earlier in class. Make sure you have these finished and ready to refer to.

Class Survey Project: Hypothesis		Age information/Standard Deviation	
Average, Median, and Mode		Measures of Spread	
Measures of Central Tendency Reflection		Connections between data sets	

Once you have everything together for the project you will begin by choosing a number of questions you can answer with basic data analysis. For each of these questions you will have:

- A question from the survey (or two questions if they are being compared)
- A hypothesis (or prediction)
- An explanation of the Tool for answering the question (details about the tools available below)
- The Tool
- An interpretation of what it all means

The Data Statistician's Toolbox

In order to finish the project, you will need to amass **10 Toolbox points** from the following options:

1. **Data Table - 1 point**
    a. This a data table that lists the results for one question from the survey.
    b. Must include the average, median, mode, standard deviation, quartiles, and IQR.
    c. Explain the table. And Check for outliers.
    d. **You can only earn points for the first 4 Data Tables in the project**
2. **Histogram - 1 point** (Possible bonus point with a box-and-whisker plot)
    a. This Histogram would list the result for one question from the survey
    b. This must include an explanation of the x-axis and y-axis and the general shape
    c. Your first histogram must be made by hand on paper in addition to on the computer
    d. **You can only earn points for the first 3 Histograms in the project**
3. **Frequency Table - 2 points**
    a. This two way table would compare the results from two questions from the survey
    b. This must include results for all of the information in both question, and accurate totals
    c. **You can only earn points for the first 3 Frequency Tables**
4. **Scatterplot - 2 points** (possible 3 points with a trend line)
    a. The Scatterplot will compare two questions from the survey
    b. This must include an explanation of the x-axis and y-axis and a correlation
    c. Your first scatterplot must be made by hand on paper in addition to on the computer
    d. If you correcly use, and explain a trendline, you can get an additional Toolbox point
    e. Y**ou can only earn points for the first 3 scatterplots**

Finally, you will need to write a cover letter explaining each of the math concepts that are used.

Let's make a plan for the project

What is your topic?

_____

_____

Which questions will you analyze?	What tool(s) will you use? Table, Histogram, Freq. Table, Scatterplot
Question: Hypothesis:	
Question: Hypothesis:	
Question: Hypothesis:	
Question: Hypothesis:	
Question: Hypothesis:	
Question: Hypothesis:	

What kind of help will you need? What questions do you have?

_____

_____

_____

_____

Class Survey Project: **Data Table**   Name _____ Date _____

What is the question you are using: _____ Who are you? _____

What is your hypothesis: _____

_____

What is a Data Table, and why are you using it here? _____

A data table is a collection of responses from a question along with other statistics

Using the survey data, record all of the important information that you need for your survey question. Examples:

Question 1: What breakfast do you want?

	Responses	Percentage
Eggs	15	(50%)
Coffee only	3	(10%)
Candy and soda	2	(6.66%)
Bitterness	4	(13.33%)
Cereal	6	(20%)
Total	30	
Average	N/A	
Median	N/A	
Mode	Eggs	
Standard Deviation	N/A	
Quartile 0	N/A	
Quartile 1	N/A	
Quartile 2	N/A	
Quartile 3	N/A	
Quartile 4	N/A	
IQR	N/A	

Question 2: Is math the best class ever!?

	Responses	Percentage
Strongly Agree (1)	56	71.79%
Agree (2)	12	15.38%
Neutral (3)	5	6.41%
Disagree (4)	3	3.85%
Strongly Disagree (5)	2	2.56%
Total	78	
Average	1.5	
Median	1	
Mode	1	
Standard Deviation	1.05	
Quartile 0	1	
Quartile 1	1	
Quartile 2	1	
Quartile 3	2	
Quartile 4	5	
IQR	1	

*Tables need to have a title, average, median, mode, standard deviation, IQR

What is your plan for creating your Table? _____

_____

Use these tables as workspace.

	Responses	Percentage		Responses	Percentage

Were there any outliers? (Use the space below to check for outliers)

_____

_____

Does the information in the table show your hypothesis is true? Why or why not?

_____

_____

_____

So... what conclusions can you make based on this data table?

_____

_____

_____

Class Survey Project: **Histogram**   Name _____ Date _____

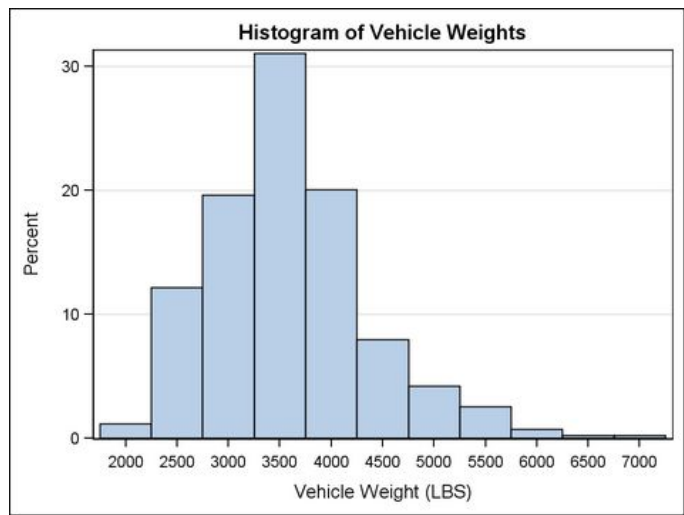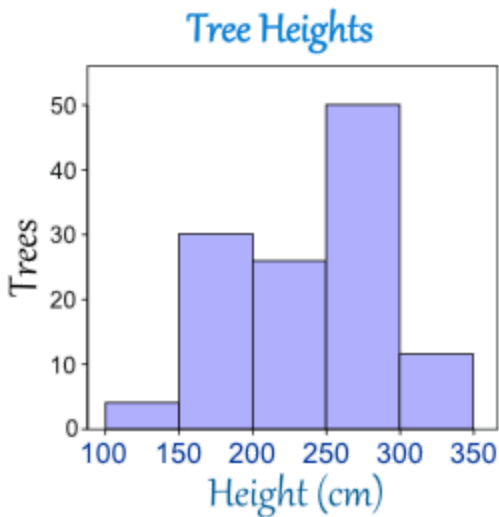What is the question you are using: _____

What is your hypothesis: _____

_____

What is a Histogram, and why are you using it here? _____

_____

_____

Optional: What is a Box-And-Whisker plot, and why are you using it here?

_____

_____

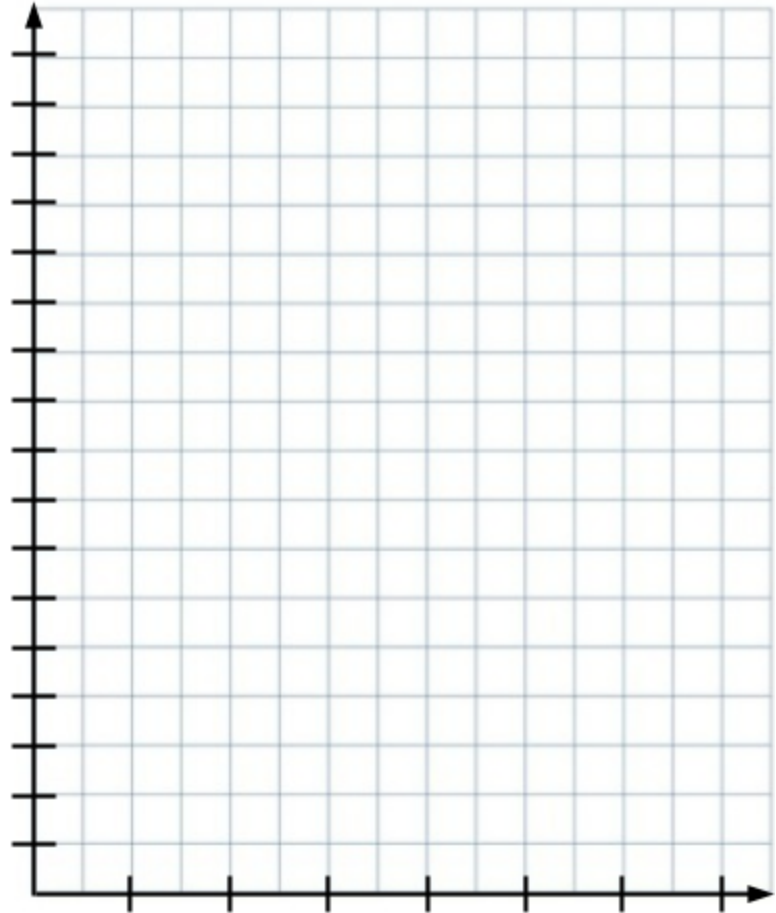Using the Statistics Add on you can make a histogram for your data

Examples:

*histograms have bars that represent all of the data between the two numbers on the axis

What is your plan for creating your Histogram? _____

_____

_____

_____

Use the space below to make a histogram by hand:

In the table below you can enter the information for your histogram.

Category/Value	Responses

How did you make your histogram?

_____

_____

Does the information in the histogram show your hypothesis is true? Why or why not?

_____

_____

_____

So... what conclusions can you make based on this histogram?

_____

_____

_____

Class Survey Project: **Frequency Table** Name _____ Date _____

What is the 1st question you are using: _____

What is the 2nd question you are using: _____

_____

Hypothesis: How do you think these questions will be related? _____

_____

_____

What is a Frequency Table, and why are you using it here? _____

_____

_____

Using the survey data, record all of the important information that you need for your survey question.
Examples:
Question 1: What breakfast do you want?
Question 2: Are you a student, former student, or teacher?

Question 1: Do you eat chicken?
Question 2: Is math the best class ever!?

	Student	Former		Total
		student	Teacher	
Eggs	4	6	5	**15**
Coffee only	0	1	2	**3**
Candy & soda	2	0	0	**2**
Bitterness	1	2	1	**4**
Cereal	3	2	1	**6**
Total	**10**	**11**	**9**	**30**

	Yes	No	**Total**
Strongly Agree	49	7	**56**
Agree	7	5	**12**
Neutral	3	2	**5**
Disagree	3	0	**3**
Strongly Disagree	2	0	**2**
Total	**64**	**14**	**78**

What is your plan for creating your Table? _____

_____

_____

Use these tables as workspace.

Were there any outliers? (Use the space below to check for outliers)

_____

_____

Does the information in the table show your hypothesis is true? Why or why not?

_____

_____

_____

So... what conclusions can you make based on this frequency table?

_____

_____

_____

Class Survey Project: **Scatterplot**   Name _____ Date _____

What is the 1st question you are using: _____
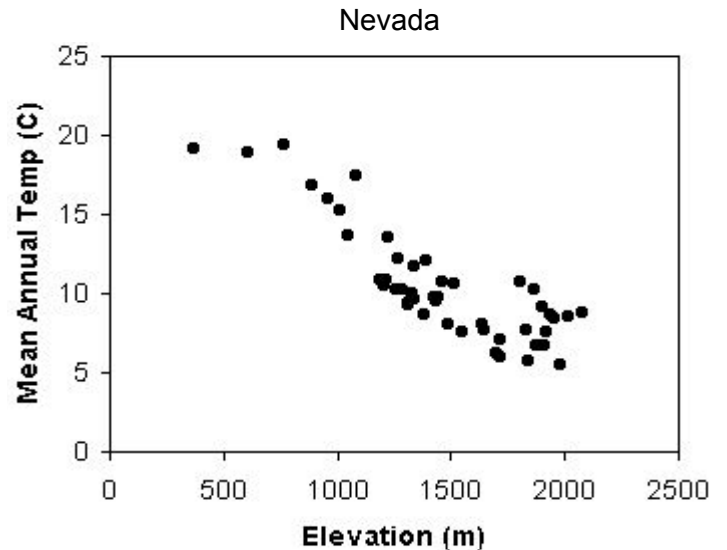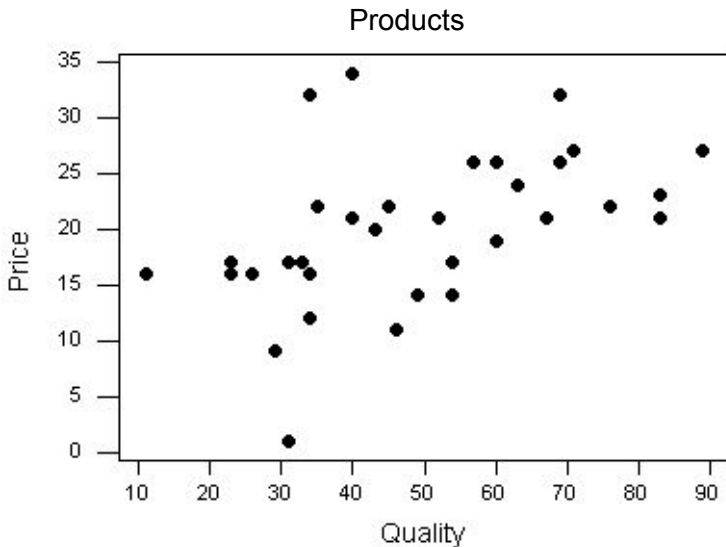
What is the 2nd question you are using: _____

_____

Hypothesis: How do you think these questions will be related? _____

_____

_____

What is a Scatterplot, and why are you using it here? _____

_____

_____

Optional: What is a trend-line, and why are you using it here?

_____

_____

Using the Statistics Add-on you can make a Scatterplot for your data
Examples:

Products

Nevada

*histograms have bars that represent all of the data between the two numbers on the axis

What is your plan for creating your Scatterplot? _____

_____

Use the space below to make a histogram by hand:

In the table below you can enter the information for your Scatterplot.

Is there a correlation in your data? If so, how is it correlated?

_____

_____

Is there a trendline that explains the correlation? (Optional)

_____

_____

How did you make your Scatterplot?

_____

_____

Does the information in the Scatterplot show your hypothesis is true? Why or why not?

_____

_____

_____
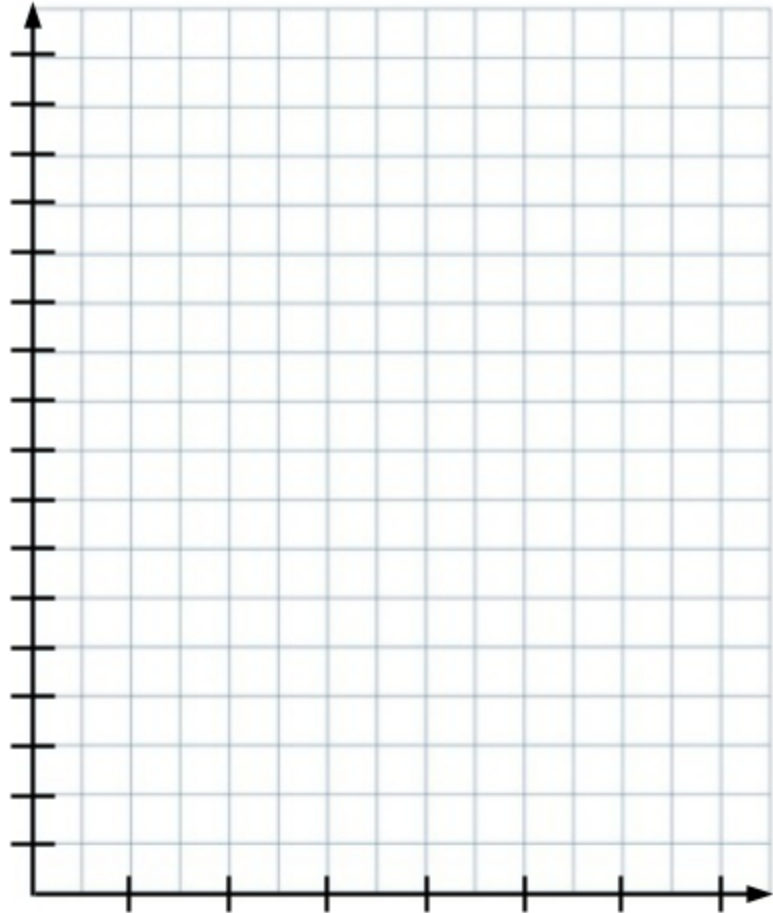
So... what conclusions can you make based on this Scatterplot?

_____

_____

_____

Class Survey Project: **<u>Cover Letter</u>**   Name _____ Date _____

For the cover letter for this project you can follow structure below. You can use these prompts to elp

1. Basic structure of the project
What do you think this class was about? _____

_____

What was the survey we did and why was it useful? _____

_____

Describe the survey was created, our sampling strategy, and how we avoided bias:

_____

_____

Anything else people need to know? _____

_____

2. Explaining your data analysis
For this part you will explain each question that you explored for the project. For the questions you
explored, you filled out one of the 'Toolbox' sheets, those sheets have all of the things you need to mention
for this section. For each sheet you completed do the following:
- Write why you were interested in this topic
- Write your questions and hypotheses
- Define the tool you are using, and how it will use it answer your question
- Show the ACTUAL CHART/TABLE. Either copy and paste a computer chart, or take a picture
- Describe what the chart and table show you about the data in general, and about your hypothesis
- Try to explain any reasons why your hypothesis was right/wrong
- Mention any other conclusions you can draw about the data.
- Mention any possible changes you would make if you were doing this again.

You should have already written about these things on each sheet, so all you're doing is typing them up
and maybe expanding on them.

3. Wrapping up the project

In the final part of the cover letter, you should say what you learned about math and about yourself:
- Why is this kind of math important? Who uses it in the real world?
- How does this connect to other math topics and lessons you have learned before?
- How would you do things differently?
- How will you use what you learned in the future?

Formula guide	
Counting "something"	=countif(A2:A94,"something")
Counting "something" and "another thing"	=countifs(A2:A94,"something",B2:B94,"another thing)
Summing a question based on "another thing"	=sumif(A2:A94,"another thing",B2:B94)

Formula guide	
Mean	=average(A2:A94)
Median	=median(A2:A94)
Mode	=mode(A2:A94)
Minimum	=Min(A2:A94)
Maximum	=Max(A2:A94)
Range	=Max(A2:A94)-Min(A2:A94)
Standard Deviation	=STDEV(A2:A94)

Formula guide	
0th Quartile (Q0)	=Quartile(A2:A94,0)
1st Quartile (Q1)	=Quartile(A2:A94,1)
2nd Quartile (Q2)	=Quartile(A2:A94,2)
3rd Quartile (Q3)	=Quartile(A2:A94,3)
4th Quartile (Q4)	=Quartile(A2:A94,4)
Interquartile range	= Quartile(A2:A94,3) - Quartile(A2:A94,1)