Statistical Research Project

by: Kayla Pham

Project Information: The Statistical Research Project is based upon the an inquiry-based, survey process. Students will create a question, survey students on campus, analyze data, and create a visual to describe their results. It is important that students use the "Statistics & Probability Sequence" to complete all activities and receive links to important videos and directions.

Extension Information: This is designed for students to complete individually or in small groups. There is also an option at the end called "extension" where students will have the same question as other students in a different part of the world. They will collaborate on developing a question for Step #1 and complete Steps #2 - #5 with their school group. At the end, they will compare information in the "extension" section and develop their visual in Step #6.

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Step 1: The Question & Process

The Question

The question must give answers that have a numerical value.

How many times does a Cedar Middle School student check their grades per week?

The Population

What is the population for the setting of your question?

The population of my survey is all students at Cedar Middle School.

The Sample

What is the sample for the setting of your question?

The sample of the my survey is 50 eighth grade students, and 50 seventh grade student.

Biased or Unbiased

How will you ensure that your survey remains unbiased?

I will make sure my survey unbiased by making sure all of my selections are random. I will also not ask any of my friends or people I am close to. I will make sure I ask completely random people. This will ensure my survey will remain unbiased. I will make sure I ask the same amount of 7th graders and 8th graders.

Type of Sampling

What type of sampling will you be using? Why?

I will be using convenience sampling, and stratified samplings. I choose these samplings because they are very convenient to do. I am using stratified because I need to make sure I make sure I choose 50 eighth graders and 50 7th graders. I am using convenience sampling because I can't go anywhere out of my convenience for this survey so convenience sampling would be a good fit for my survey. That is why I choose to use convenient and stratified.

The Sampling Process

Describe your sampling method process. How will you be gathering your data? Who will you be asking? Where will you be asking these questions?

I will be standing at the door at the cafeteria asking people who walk in my question. I will collect my data on a sheet of a paper. I will be asking my question at lunch. Whoever walks into the cafeteria, I will ask them my question.

The Theoretical Outcome

What do you expect to discover from this survey? What do you predict the outcome will be?

I think I will discover that Cedar Students check their grades not that often. I predict the number of times students check their grades per week will be low.

Step 2: The Data

Part 1: Gather the Data

- Complete a survey of 50-100 individuals and record the data below.
- Remember that the data should be in the form a of a number - not tally marks.

Data Gathered from Survey									
1	5	2	5	7	1	1	5	0	7
5	3	4	3	1	7	2	0	3	10
3	0	4	2	27	7	2	1	1	0
1	3	2	5	7	0	1	0	1	1
5	2	1	2	5	3	3	3	2	1
3	7	2	14	10	3	0	7	5	5
3	3	0	0	3	3	3	3	1	2
4	2	0	0	3	3	0	1	3	3
1	5	2	7	0	14	11	10	10	1
3	7	3	2	0	0	1	2	3	0

- Use the data from above and organize it in order from least to greatest.

Data Organized from Survey									
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	2	2	2	2	2	2	2
2	2	2	2	2	2	2	3	3	3
3	3	3	3	3	3	3	3	3	3
3	3	3	3	3	3	3	3	3	3
3	3	4	4	4	5	5	5	5	5
5	5	5	5	5	5	7	7	7	7
7	7	7	7	10	10	10	14	14	27

Step 3: Organizing the Data

Part 1: Organize the Data

- Organize the data from Part 2 into a frequency table.
- The frequency table should contain a **minimum** of 4 intervals.
- To create a frequency table, view this video:

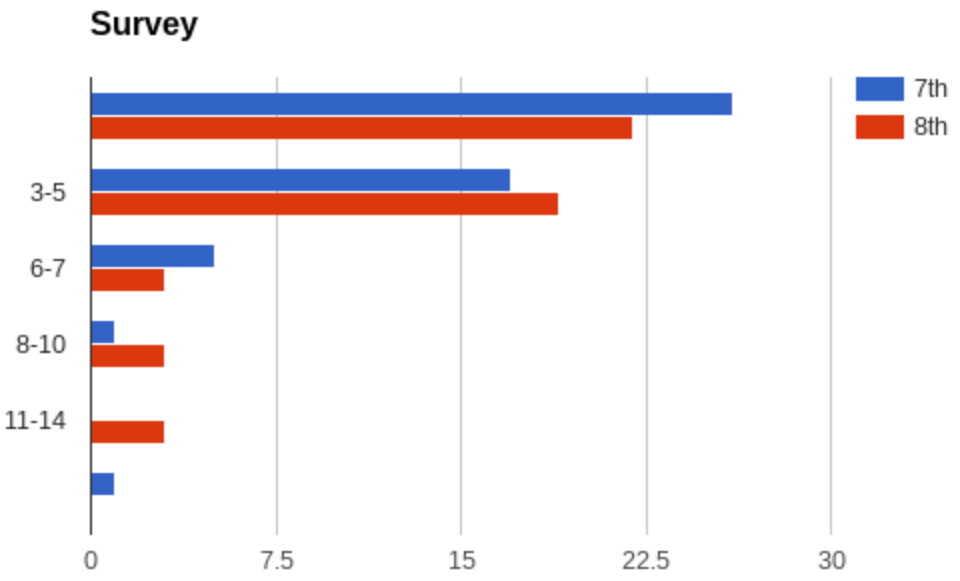
Frequency Table 7th		
Intervals	**Tally Marks**	**Frequency**
0-2	||||| ||||| ||||| ||||| ||||| |	**26**
3-5	||||| ||||| ||||| ||	**17**
7-10	||||| |	**6**
11+	|	**1**

Frequency Table 8th		
Intervals	Tally Marks	Frequency
0-2	||||| ||||| ||||| |||||	20
3-5	||||| ||||| ||||| |||||	20
7-10	||||| ||	7
11-14	|||	3

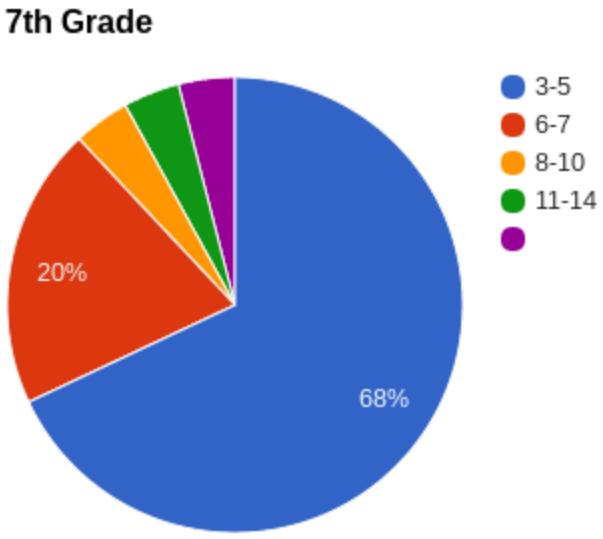
Part 2: Creating Visuals

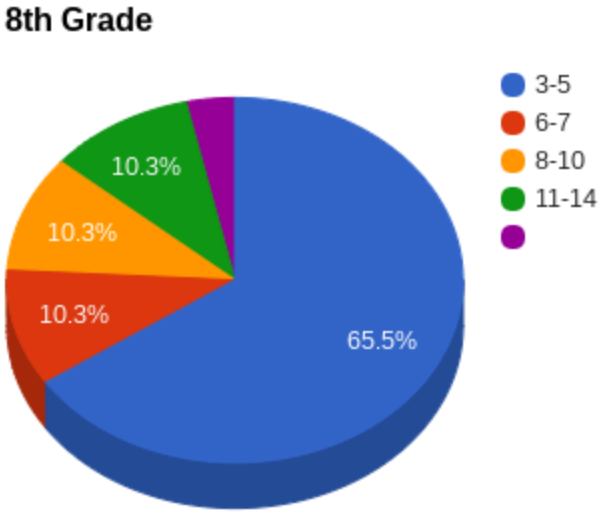
- Create the following visuals to describe the data you have gathered:
  - Bar Chart
  - Pie Chart
  - Box-Whisker Plot
- The bar chart and pie chart can be created in Google Sheets. To learn how to create the charts, view this video:
- The box-whisker plot can be created in Google Drawings.

Bar Chart


Survey
7th
8th
3-5
6-7
8-10
11-14
0
7.5
15
22.5
30

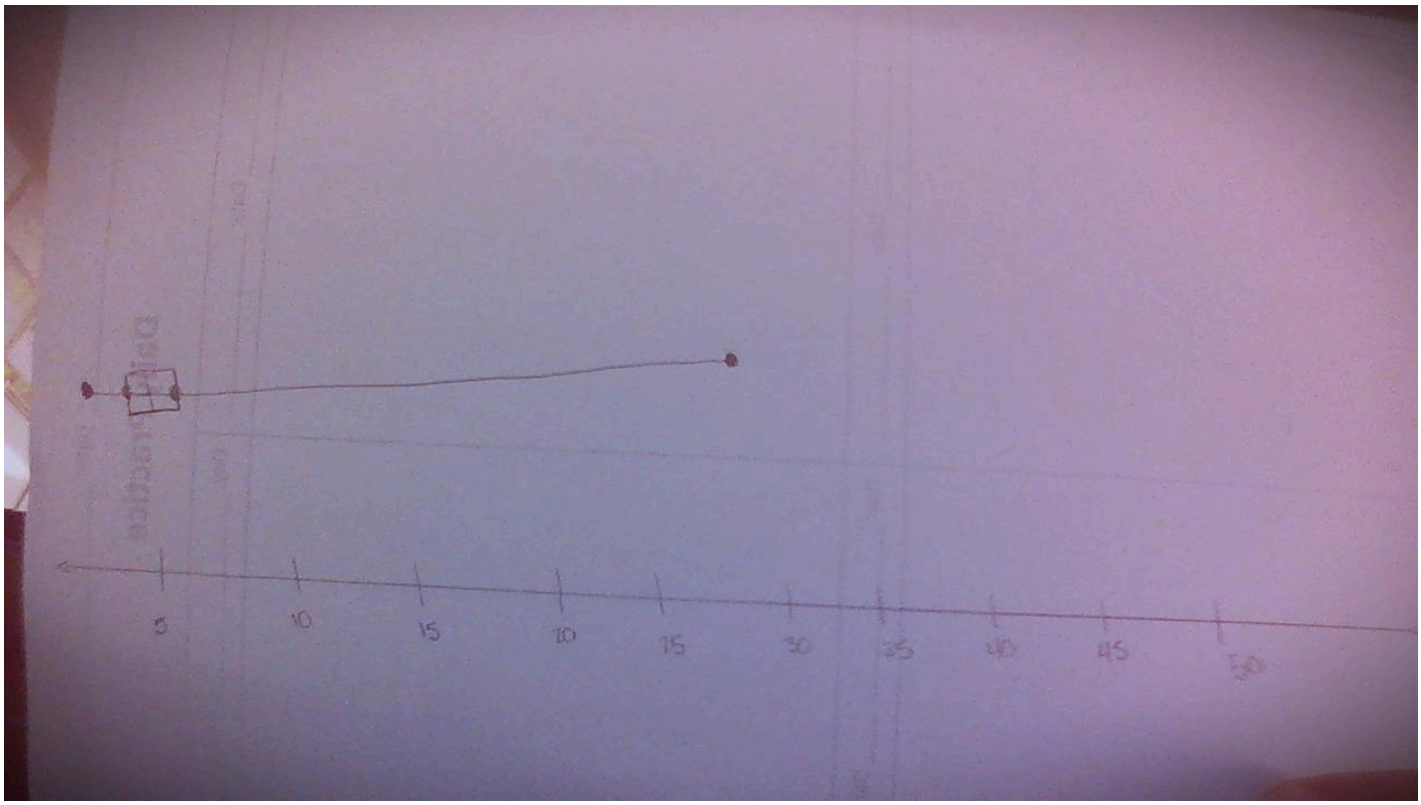
Pie Chart

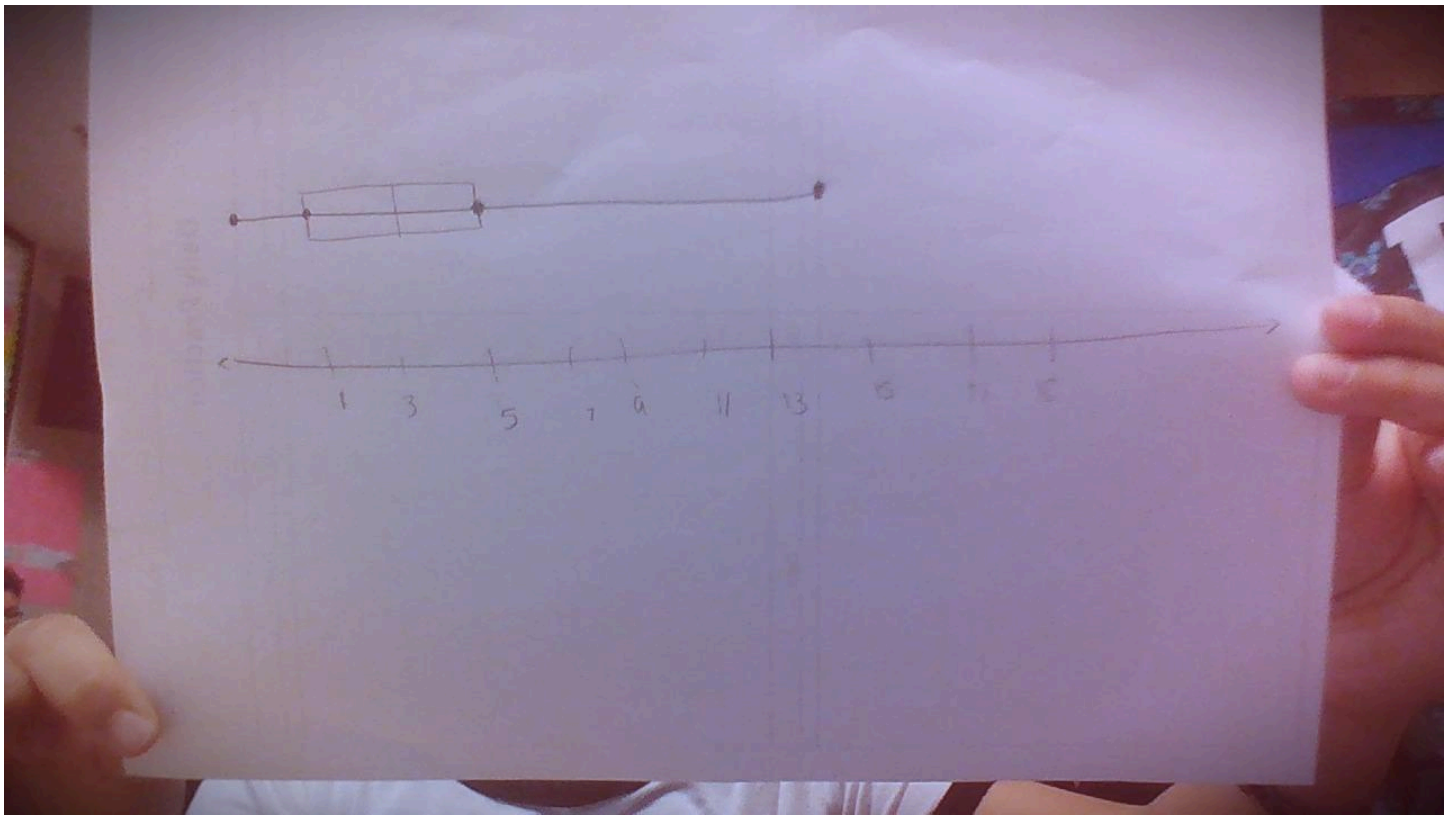

7th Grade
3-5
6-7
8-10
11-14
20%
68%



Box-Whisker Plot

Complete after Step #5.





What do the graphs tell you about the data you gathered?
The graphs tell me that people do not check their grades very often. It seems like 7th graders check their grades more often than 8th grades. 7th graders seem to check their grades more often than 8th graders. But it also told me the majority of people choose 3-5.

Step 4: Mean, Median, Mode, & Range

Part 1: Calculate the Mean, Median, Mode, and Range

- Calculate the mean, median, and mode from the data you gathered.

Mean	Median	Mode	Range
3.32	5	2	27

Mean	Median	Mode	Range

3.56	3	3	14

Part 2: Analyze the Mean, Median, Mode, and Range

- Define the mean, median, mode, and range.
- Discuss how the mean, median, mode, and range that you calculated in Part 1 describes your data.

	What is the definition of the term?	What does this tell you about your data?
Mean	The mean is the average of the number set. It is found by adding all the numbers up and dividing the that number by how many numbers there are.	This tells me that the average of my 7th grade data is 3.32 and the average of my 8th grade data 3.56. The mean told me the average of my data, and it told me that the 8th grade average was higher than the 7th grade average.
Median	The median is the middle number, in the number set.	The median told me that the middle number of my data set for my 7th grade data was 5 and the middle number for my 8th grade number is 3. That tells me that the 7th graders have a higher mode than the 8th graders. So that would also probably mean the 7th graders have higher numbers than the 8th graders.
Mode	The mode is the number that appears the most in a number set.	The mode told me that the majority of 7th graders I surveyed said 2. The mode also told me that the majority of 8th graders I surveyed said 3. So the mode tells me what number 7th or 8th graders choose the most.
Range	The range is the difference between the highest number and the lowest number.	The range told me that the 7th graders range was 27 and the 8th graders range is 14. This tells me that the 7th graders probably check their grades more. This also tells me that some kids check their grade a lot!

Part 5: Probability

Part 1: Determine the Probability

- Organize the data from Part 2 into a frequency table.
- The frequency table should contain a **minimum** of 4 intervals.
- To create a frequency table, view this video:

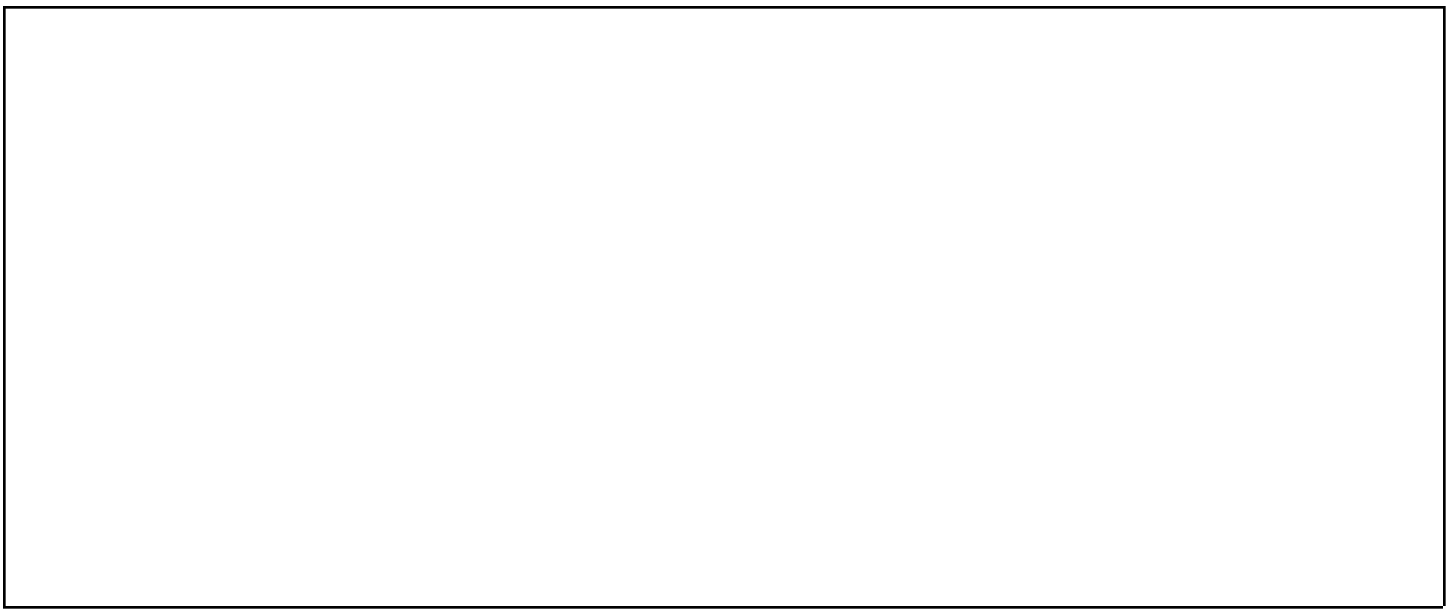
Frequency Table with Probability			
Intervals	**Tally Marks**	**Frequency**	**Probability**
0-2	||||| ||||| ||||| ||||| ||||| |	**26**	**26/50 = 13/15**
3-5	||||| ||||| ||||| ||	**17**	**17/50**
7-10	||||| |	**6**	**6/50 = 3/25 = 1/5**
11+	|	**1**	**1/50**

Frequency Table with Probability			
Intervals	**Tally Marks**	**Frequency**	**Probability**
0-2	||||| ||||| ||||| |||||	20	**20/50 = 10/25**
3-5	||||| ||||| ||||| |||||	20	**10/25**
7-10	||||| ||	7	**7/50**
11-14	|||	3	**3/50**

Part 2: Analyze the Data

- Describe what the probabilities tell you about your data.

What does the probability tell you about your data?
The probability tells me the chances of that more people are likely to choose a number 3-5. I also saw that not many people checked their grades very often. Very few people checked their grades over 10 times a week. The probability tells me that the majority of people checked their grades an average amount of 2 times according to my data. It told me that not many people checked their grades over 5+ a week.



Step 6: Summary of the Data

Part 1: Create a Visual of Your Data and Results

- Create a visual of your data that reviews **every** step of your project:
    - The Question & Process
    - The Data
    - The Visuals
    - Mean, Median, Mode & Range
    - Probability
- The visual should include an analysis of your data and answer the following questions:
    - What conclusions were you able to draw from the data you gathered?
    - Were these the conclusions you originally thought you would receive?
- To get some ideas for your visual, view the following document: <Insert Document>
- When you are done creating your visual, create a link to your visual and post it below.

Visual of Data and Results Create a link to your visual and post below.
https://spark.adobe.com/video/T9vzRJG8A1H0c

IMPORTANT: If you are completing the "extension" portion of this project. Complete the extension section below before creating your visual of your data.

Extension: Collaborating Across the World

Part 1: Comparing the Data

- Copy and paste the information from Step #5 into the table below.
- Share your information with your partner group. They will share their information with you.
- Input the information from your partner school into the table below.

Frequency Table with Probability (Your School)			
Intervals	**Tally Marks**	**Frequency**	**Probability**

Frequency Table with Probability (Partner School)			
Intervals	**Tally Marks**	**Frequency**	**Probability**

Part 2: Analyzing the Data

- What did you notice about the data between the two schools? Why do you think these similarities or differences exist?

Analyze the Data