6-2017

Becoming Critical Analyzers of Data, 6th Grade Math

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UNDERSTANDING BY DESIGN

Unit Cover Page

Unit Title: Becoming Critical Analyzers of Data

Grade Level: 6th Grade

Subject/Topic Area(s): Math

Designed By: Claudia Cárdenas

Time Frame: ~23 days

School District: SAISD

School: Tafolla Middle School

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Brief Summary of Unit

This unit's focus is on data analysis including: measures of central tendency and spread shown in dot plots, stem-and-leaf plots, histograms, and box plots (specifically TEKS 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B). Students will be building on their prior knowledge of bar graphs, frequency tables, dot plots and stem-and-leaf plots to include histograms and box plots. Students will be introduced to measures of central tendency, including: mean and median, as well as measures of spread, including: mode and range. Students will not only learn how to create each graphical representation, but they will be expected to interpret and describe information provided by these visuals as well. This unit will culminate in a performance assessment where students will create a survey question, gather data, analyze the data, and present the data using the graphical representations we will be studying. In this way, students will gain personal experience with how data is obtained, evaluated, and presented in society. Students will be able to compare various sources of data, including: newspapers, magazines, social media, sports, etc. Students will also discuss how data can be skewed to persuade audiences towards a certain opinion and how to become critical analysts of data in a 21st century world.

6th Grade Math: Becoming Critical Analyzers of Data (~23 days)

Stage 1 – Desired Results

Established Goals (e.g., standards)
TEKS:
6.12A: Represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms and box plots. (Supporting)
6.12B: Use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution. (Supporting)
6.12C: Summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread) and use these summaries to describe the center, spread, and shape of the data distribution. (Readiness)
6.12D: Summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table) and the percent bar graph, and use these summaries to describe the data distribution. (Readiness)
6.13A: Interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots. (Readiness)
6.13B: Distinguish between situations that yield data with and

Transfer

Students will independently use their learning to…
Critically analyze data that is shown in various forms of media, such as news, social media, magazines, sports etc.
Understand how data is used to persuade audiences of specific perspectives.
Inference conclusions and/or predictions from any given set of data.

Meaning

Understandings
Students will understand that….

- Statistical data can be represented and described in various ways.
- Choosing a graphical representation depends on the type of question being asked about the data being presented.
- Graphical representations can skew audiences' perspectives and interpretations.
- Analysis of data is affected by the specific graphical representation.
- Data analysis reveals valuable information in any given medium.

Essential Questions
Students will keep considering….

- What is data?
- How does representations and descriptions of data influence conclusions and/or predictions?
- What role does data analysis play in everyday life?
- Why is it important to critically analyze data in a 21st century world?
- How can data be manipulated to persuade viewers of a certain opinion?

Acquisition

Knowledge
Students will know…

1. Data sets include rational numbers
2. The steps to create different graphical representations, including: dot plots, stem-and-leaf plots, histograms, and box plots
3. The difference between measures of center and measures of spread
   - Measures of Center: mean and median
   - Measures of Spread: range and interquartile range (IQR)
4. How outliers affect data
5. Measures of center and Measures of spread give a summary of what is represented graphically and numerically
6. How to describe the information on different graphical representations,

Skills
Students will be able to…

1. Represent numeric data in graphs: dot plots, stem-and-leaf plots, histograms, and box plots
2. Describe center, spread and shape of graphical representations and data distributions
3. Summarize numeric data with numerical summaries: mean, median, range, interquartile range (IQR)
4. Summarize categorical data with numerical and graphical summaries: mode, relative frequency, percent bar graph
5. Interpret numeric data summarized in: dot plots, stem-and-leaf plots, histograms, and box plots
6. Distinguish between situations that yield data with and without variability

without variability. (Supporting)	including: dot plots, stem-and-leaf plots, histograms, and box plots 7. The steps to find mean, median, mode, range, and interquartile range - Mean: the sum of all numbers divided by the quantity of data points - Median: the middle number of a data set in numerical order - Mode: the number that occurs the most in a data set - Range: the difference between the greatest and least number in a list of data - Interquartile range: the difference between the median of the third quarter and the median of the first quarter in a list of data 8. How to find the median when given two numbers in the middle of a data set 9. The differences between mean, median, mode, range, and interquartile range 10. The specific steps needed to create an accurate graphical representation 11. How to describe the data distribution using the unit's academic vocabulary 12. How to decide which graphical representation will best visualize the given data 13. The difference between numerical data and categorical data 14. Categorical and numerical data cannot always be displayed by the same graphical representation 15. How to find relative frequency using a table 16. How to display relative frequency using a percent bar graph 17. The difference between situations that yield data with and without variability 18. Situations differ in yielding data with or without variability	7. Find mean, median, mode, range, and interquartile range (IQR) of a given data set 8. Represent data on a dot plot, stem-and-leaf plot, histogram, box plot, and percent bar graph 9. Differentiate between various graphical representations and their information 10. Determine which graphical representation will best visualize a given set of data 11. Defend arguments using academic vocabulary and data from different graphical representations

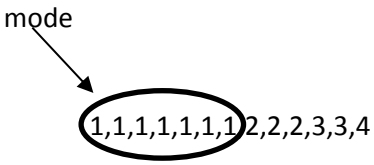
Stage 2 – Evidence

CODE (M or T)	**Evaluative Criteria** (for rubric)	

T M/T T T M T M M M M M M	Content Calculations Graphs Summary Quality (Neatness) Presentation	Performance Task(s) *Students will demonstrate meaning-making and transfer by…* Creating a survey question that will be used to gather data in order to collect, analyze, display, and present their findings using the graphical representations learned throughout the unit. Students will be given a menu of choices on how to best complete the project. There will be basic requirements that all students will need to complete and additional components for different interests. Extension: Students will be given options on how to present this data using: prezi, powerpoint, poster boards, etc. Support: Students that need additional support will only need to complete the basic choices of the menu in order to receive full credit on performance task --- Other Evidence (e.g., formative) Pre-assessment Do-Nows (Warm-Ups) Checks for Understanding Exit Tickets Weekly Homework Post-assessment

Stage 3 – Learning Plan

CODE (A, M, T)	Pre-Assessment *How will you check students' prior knowledge, skill levels, and potential misconceptions?*	
A	Students have gone over bar graphs, dot plots, stem-and-leaf plots, and frequency tables in 5th grade (5.9A and 5.9C). Therefore, students will be assessed over these graphical representations, as well as vocabulary that was used in 5th grade and will translate over to 6th grade vocab (e.g., average is now mean). Student performance on this pre-assessment will determine how familiar students are with unit vocabulary and creating and interpreting graphical representations from given data sets. Results will be used to determine the students that may need additional support, as well as students that need enrichment activities prepared for them. Students will continue to be assessed on their learning through daily Do-Nows. Do-Nows contain problems on topics that were taught in the previous lesson. Potential misconceptions will be addressed through progress monitoring, including: Do Nows, Checks for Understanding, Exit Tickets, and Homework assignments.	
	Learning Activities <u>Day 1 – TEKS focus: Spiraled from 5th grade</u> Pre-Assessment **Essential Question:** *What is data?*	Progress Monitoring (e.g., formative data)
M	**Do Now: (5 min)** Looking at the data from a survey, create a bar graph of the information.	Check Do Now
M	**Pre-assessment: (25 min)** Students will only have part of the class period to work on the pre-assessment independently.	
M	**Check pre-assessment: (10 min)** Teacher will lead students on grading their partner's pre-assessment. The final scores will be written on the tops of the papers according to the teacher's grading scale. These pre-assessments will be turned in for teacher analysis.	Check for Understanding
M	**Exit Ticket: (5 min)** Looking at the bar graph, which category is seen the most?	Check Exit Ticket
M	**Homework:** *Weekly Math Homework 1* will be handed out. This double-sided page includes spiraled problems from previous lessons as well as upcoming topics that will be covered throughout the week.	Check Homework on Friday

	<u>Day 2 – TEKS focus: 6.12C & 6.13B</u> Vocabulary & Data with/without Variability **Essential Question:** *What is data?*	
M	**Do Now: (5 min)** Looking at the data from a survey, create a dot plot of the information.	Check Do Now
A	**Vocabulary Intro: (20 min)** Teacher will go through vocabulary including: term, definition, helpful hint and visual aid Example: <u>Mode:</u> the number in a data set that occurs the most Helpful hint: Mo' often than any other number Visual: 	
	Students will take notes on a coordinating page where they will fill in the blanks with the term and draw the visual.	Check for Understanding
A/M	**Data with/without Variability: (15 min)** Teacher will lead students through situations that could yield data with/without variability. Students will vote on what their opinion is before revealing each answer. Students will defend the choices they made by giving their reasoning for believing it has variability or does not.	Check for Understanding
M	**Exit Ticket: (5 min)** Given this situation, determine if the data would have variability or not. Support your answer.	Check Exit Ticket
M	**Homework:** Students continue to work on *Weekly Math Homework 1*.	Check Homework on Friday
	<u>Day 3 – TEKS focus: 6.12C, 6.12D</u> Mean, Median, Mode, and Range **Essential Questions:** *What is data? How does representations and descriptions of data influence conclusions and/or predictions? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given the following data set, list them in ascending order.	Check Do Now
A/M	**Discussion: (5 min)** Teacher will lead discussion on how numbers can be manipulated and how they have been manipulated throughout the year (e.g., rational number conversions, scale factors, proportions, solving equations, etc.) Data analysis is focused on the manipulation of data to reveal even more information that what is originally seen.	Check for Understanding
A/M	**Lesson: (30 min)** Teacher reviews terms that were touched on in the vocabulary lesson. Students can use their vocabulary page as a reference. Watch video (https://www.youtube.com/watch?v=5C9LBF3b65s). I Do: Teacher will lead students in finding the mean, median, mode, and range of given data sets, as well as write statements about what the numbers mean (e.g., On average, students read 30 pages a month. The most popular number of movies students watch during a summer is 5. The middle of the list of data was 15 sodas. The data ranged 34 likes per picture.) We Do: Students will lead the teacher in finding the mean, median, mode, and range of given data sets and include their written descriptions of the data. You Do: Students will then take on the Stacking Cups Challenge. This challenge has students work in groups (2, 3, or 4 depending on how	

	many data points you want students to have). They will be given a set of plastic cups. Students will have 3 min to stack up their cups into a freestanding structure without them falling over. Once time is up, the teacher will collect the data from each group writing down how many cups they have in their structure. Students will write down the completed data set and find the mean, median, mode, and range of the data. This process will repeat each round.	Check for Understanding
M	**Exit Ticket: (5 min)** Given the mean, median, mode, and range of the data. Write at least two sentences about what these numbers mean given the situation?	Check Exit Ticket
M	**Homework:** Students continue to work on *Weekly Math Homework 1*	Check Homework on Friday
	<u>Day 4 – TEKS focus: 6.13A</u> Data in the Real World **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given this situation, determine if the data would have variability or not. Support your answer.	Check Do Now
A/M	**Discussion: (5 min)** What do we know about statistics and data? Where do we see data in our everyday life? What purpose does data play in our lives? Why do we think data is important?	Check for Understanding
A/M	**Article Analysis: (25 min)** Students will be in pairs and given a set of article cutouts and an analysis sheet. Each partner will choose a different article and answer the questions on their own analysis sheet. They may help each other on answering the questions.	Check for Understanding
M	**Article Analysis Debrief: (5 min)** Teacher will lead students through a debrief of activity	Check for Understanding
M	**Exit Ticket: (5 min)** What are some key words that we can look for to ensure that statistical studies are valid?	Check Exit Ticket
M	**Homework:** Students continue to work on *Weekly Math Homework 1*.	Check Homework on Friday
	<u>Day 5 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A</u> Dot Plots- Representing, Summarizing, Describing, and Interpreting **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given the dot plot, what quantity occurs the most?	Check Do Now
A	**Lesson: (35 min)** I Do: Teacher leads students through guided notes on dot plots. We Do: Students lead teacher through the completion of practice problems on creating a dot plot. You Do: Students work independently (or with partner) to complete remaining problems.	Check for Understanding
M	**Exit Ticket: (5 min)** Given the dot plot, which sentence best describes the information and why?	Check Exit Ticket
M	**Homework:** Students turn in *Weekly Math Homework 1*.	Check Homework
	<u>Day 6 & 7 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A</u>	

	Stem-and-Leaf Plots - Representing, Summarizing, Describing, and Interpreting (2 days are given so time can be given for each problem since students will be new to seeing rational numbers in stem-and-leaf plots. Day 6's ending point will be Day 7's beginning point) **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given the stem-and-leaf plot, how many values are greater than _____?	Check Do Now
A	**Lesson: (35 min)** I Do: Teacher leads students through guided notes. We Do: Students lead teacher through the completion of practice problems on creating stem-and-leaf plots. You Do: Students work independently (or with partner) to complete remaining problems.	Check for Understanding
M	**Exit Ticket: (5 min)** Given the stem-and-leaf plot, which sentence best describes the information and why?	Check Exit Ticket
M	**Homework:** Students work on *Weekly Math Homework 2*.	Check Homework on Friday
	<u>Day 8 & 9 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A</u> Histograms - Representing, Summarizing, Describing, and Interpreting (2 days are given so time can be given for each problem since students will be new to seeing histograms. Day 8's ending point will be Day 9's beginning point) **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given the stem-and-leaf plot, how many values are lesser than _____?	Check Do Now
A	**Lesson: (35 min)** I Do: Teacher leads students through guided notes. We Do: Students lead teacher through the completion of practice problems on histograms. You Do: Students work independently (or with partner) to complete remaining problems.	Check for Understanding
M	**Exit Ticket: (5 min)** Given the histogram, which sentence best describes the information and why?	Check Exit Ticket
M	**Homework:** Students work on *Weekly Math Homework 2*.	Check Homework on Friday
	<u>Day 10 & 11 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A</u> Box Plots - Representing, Summarizing, Describing, and Interpreting (2 days are given so time can be given for each problem since students will be new to seeing box plots. Day 10's ending point will be Day 11's beginning point) **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a*	

	21st century world? How can data be manipulated to persuade viewers of a certain opinion?	
M	**Do Now: (5 min)** Given the histogram, what labels would you use for the x- and y- axes?	Check Do Now
A	**Lesson: (35 min)** I Do: Teacher leads students through guided notes. We Do: Students lead teacher through the completion of practice problems on creating box plots. You Do: Students work independently (or with partner) to complete remaining problems.	Check for Understanding
M	**Exit Ticket: (5 min)** Given the box plot, which sentence best describes the information and why?	Check Exit Ticket
M	**Homework:** Students turn in *Weekly Math Homework 2* and begin working on *Weekly Math Homework 3*.	Check Homework 2
	<u>Day 12 & 13 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A</u> Categorical Data & Relative Frequency Graphs - Representing, Summarizing, Describing, and Interpreting (2 days are given so time can be given for each problem since students will be new to creating relative frequency graphs with percents. Day 12's ending point will be Day 13's beginning point) **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given the box plot, what is the range of the data?	Check Do Now
A	**Lesson: (35 min)** I Do: Teacher leads students through guided notes. We Do: Students lead teacher through the completion of practice problems on creating relative frequency graphs. You Do: Students work independently (or with partner) to complete remaining problems.	Check for Understanding
M	**Exit Ticket: (5 min)** Given the graph, what was the most popular choice?	Check Exit Ticket
M	**Homework:** Students work on *Weekly Math Homework 3*.	Check Homework on Friday
	<u>Day 14 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A</u> Graph Differentiation **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Fill in the relative frequency table using the given information.	Check Do Now
M	**Lesson: (30 min)** Teacher will split students into groups of 4. Each group will be given a bag of cards. Each card will have a different graphical representation: dot plot, stem-and-leaf plot, histogram, and box plot. (These graphical representations will be graphing the same data set.) There will also be a card with the original data set and four valid statements. Students will each take a graphical representation and determine which statement best describes their graph. Students will use a recording sheet to write down which graph they matched with which	

	statement. Once the group has matched each graph with statement, teacher will check on their accuracy and give feedback. The group will receive a new bag of graphical representations and repeat the process. (Having 3 different sets of graphical representations will prep for groups that move faster in the given time.)	Check for Understanding
M	**Lesson Debrief: (5 min)** Teacher will lead students through a discussion about how the activity went and what takeaways they have from their experience with the group.	Check for Understanding
M	**Exit Ticket: (5 min)** Which statement does NOT describe the given graph?	Check Exit Ticket
M	**Homework:** Students continue working on *Weekly Math Homework 3*.	Check Homework on Friday
	<u>Day 15 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A</u> Graph Determination **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Which statement cannot be true given the following graph?	Check Do Now
M	**Lesson: (30 min)** Teacher will place a data set on the board. Students will be given the option to graph this data in whichever graphical representation they choose with the understanding that they will need to challenge themselves on graphs they do not favor. Desks will be set up in groups of 4 as a station for each graphical representation. There will be four stations: dot plot, stem-and-leaf plot, histogram, and box plot (stations can repeat if there is a large class). There will be no more than four students to a station. Once instructions have been given, students will be encouraged to graph the first data set using their favorite graphical representation. Students will graph their data on a recording sheet that they will take with them to each station. After 10 min, teacher will instruct students to rotate to a slightly more challenging graphical representation station. (Again, no more than four students to a station.) After another 10 min, teacher will instruct students to move to the most challenging graphical representation station of their choosing.	Check for Understanding
M	**Lesson Debrief: (5 min)** Teacher will lead students through a discussion on how they felt with the restrictions of the activity, as well as any other takeaways they had from the activity.	Check for Understanding
M	**Exit Ticket: (5 min)** Given the following dot plot, find the median, mode, and range of the data.	Check Exit Ticket
	Homework: Students turn in *Weekly Math Homework 3*.	Check Homework
	<u>Day 16 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B</u> Introduction to Data Analysis Project and Step 1: Survey Question **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given the following box plot, find the median, range, and IQR.	Check Do Now
A/M	**Project Introduction: (15 min)** Teacher will pass out *Becoming Critical Analyzers of Data, 6th Grade Project* and go over the goals and	

	expectations of the upcoming project. Students will write down the due date of the project, along with the individual due dates for the specific steps to complete the project. Students will then choose their partner (partners can also be decided by teacher) with the understanding that the project is worth a test grade so they should be cautioned into picking their best friend. Partners will also be graded individually for the work that they complete by both the teacher and their partner. Any questions will be discussed at this time. Teacher will then go over the *Data Analysis Rubric* and discuss how each part of the project will be graded. After the rubric, teacher will lead students through Step 1: Survey Question telling students what is due by the end of the period. All data must be collected by the next class period in order to begin Step 3. Once final questions are addressed, students will begin working on their survey question.	Check for Understanding
T	**Project Step 1: (20 min)** Teacher will need to approve each survey question, encouraging repetitive questions to be adjusted in order to get a good variety of research projects within a class period. Once survey questions are completed, partners need to decide how they will gather their data before the next class.	Check for Understanding
M	**Exit Ticket: (5 min)** How will you and your partner gather your data before the next class period?	Check Exit Ticket
T	**Homework:** Gather data points from your survey question.	Check Homework next class
	<u>Day 17 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B</u> Steps 3 & 4: Numerical Summaries of Data and Data Representation **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Find the mean, median, mode, and range of the given data set.	Check Do Now
T	**Project Step 3: (35 min)** Teacher will check that all partners have their data. Once students have been checked off, partners will begin finding the numerical summaries of their data. If students do not have their data, they will gather it during the class period from other classes (with prior notice given to these classes). If students finish finding their numerical summaries, they may begin work on representing their data in the four graphical representations.	Check for Understanding
M	**Exit Ticket: (5 min)** How are my partner and I doing on completing our project? (Ahead of schedule, on time, behind) What step are we on?	Check Exit Ticket
	<u>Day 18 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B</u> Steps 4 & 5: Data Representation and Data Description **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Using the following frequency table, create a histogram of the data.	Check Do Now
T	**Project Step 4: (35 min)** Teacher will sign off for partners that are beginning their data representations. Students will begin creating their graphical representations. Students that are behind will continue where	

	they left off. Students that finish their data representations with begin describing their data.	Check for Understanding
M	**Exit Ticket: (5 min)** How are my partner and I doing on completing our project? (Ahead of schedule, on time, behind) What step are we on?	Check Exit Ticket
	<u>Day 19 – TEKS focus 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B</u> Steps 5 & 6: Data Description and Data Interpretation **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given the following graph, which sentence best describes the graph?	Check Do Now
T	**Project Steps 5 & 6: (35 min)** Teacher will sign off for partners that are finishing their data description and beginning data interpretation. Students will complete both sections by the end of the day. Students that are finished with both may begin working on their data displays on whichever medium they chose: poster board, powerpoint, prezi, etc.	Check for Understanding
M	**Exit Ticket: (5 min)** How are my partner and I doing on completing our project? (Ahead of schedule, on time, behind) What step are we on?	Check Exit Ticket
	<u>Day 20 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B</u> Step 7: Data Display Day 1 **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given the following data set, create a box plot.	Check Do Now
T	**Project Step 7: (35 min)** Students will all need to begin displaying their data. They may display their data on poster boards, powerpoints, prezi, etc.	Check for Understanding
M	**Exit Ticket: (5 min)** How are my partner and I doing on completing our project? (Ahead of schedule, on time, behind) What step are we on?	Check Exit Ticket
	<u>Day 21 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B</u> Step 7: Data Display Day 2 **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Given the following data set, create a stem-and-leaf plot.	Check Do Now
T	**Project Step 7: (35 min)** Students will continue working on their data displays. They may display their data on poster boards, powerpoints, prezi, etc. Students that are finished may take part in the Super Star Challenge where they create more than one medium for their project for extra credit (a news article, brochure, etc.).	Check for Understanding
M	**Exit Ticket: (5 min)** Will my partner and I be ready to present our data tomorrow? If not, what is needed to finish before tomorrow as homework?	Check Exit Ticket

T	**Homework:** Remaining project so that it will be ready to present the following class period. <u>Day 22 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B</u> Step 8: Data Presentation Day 1 **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Divide up how you and your partner will present the project. For example, I will say these slides, you will say these slides. Write down what you are responsible for.	Check Do Now
T	**Project Step 8: (35 min)** Partners will have a maximum of 5 minutes to present their project. Teacher will take notes and comments on the presentation. After the partners are done presenting, they will complete the partner grading portion of the rubric and turn it in to the teacher. All materials will need to be turned in after the partners have presented, including all steps' pages and rubric. Any partners being disrespectful during others' presentations will have a loss of points on their presentation portion of their grade.	Rubric Comments
M	**Exit Ticket: (5 min)** Write down which partner pair you think did the best job presenting today and why.	Check Exit Ticket
	<u>Day 23 – TEKS focus: 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B</u> Step 8: Data Presentation Day 2 **Essential Questions:** *How does representations and descriptions of data influence conclusions and/or predictions? What role does data analysis play in everyday life? Why is it important to critically analyze data in a 21st century world? How can data be manipulated to persuade viewers of a certain opinion?*	
M	**Do Now: (5 min)** Divide up how you and your partner will present the project. For example, I will say these slides, you will say these slides. Write down what you are responsible for. If you have already presented, write down a few sentences of advice to another partner pair that hasn't presented yet.	Check Do Now
T	**Project Step 8: (35 min)** Partners will have a maximum of 5 minutes to present their project. Teacher will take notes and comments on the presentation. After the partners are done presenting, they will complete the partner grading portion of the rubric and turn it in to the teacher. All materials will need to be turned in after the partners have presented, including all steps' pages and rubric. Any partners being disrespectful during others' presentations will have a loss of points on their presentation portion of their grade.	Rubric Comments
M	**Exit Ticket: (5 min)** Write down which partner pair you think did the best job presenting today and why.	Check Exit Ticket

Day 1

Name: _____ Date: _____ Period: _____

5th Grade Pre-Assessment

1. Match the terms to the correct definition. Write down the number that matches each letter on the line.

a. Survey _____	1. A value that is separated from the rest of the data.
b. Sample _____	2. Clear, easy to understand, and generates a single response.
c. Range _____	3. Part of a bigger group that is selected to represent the whole group.
d. Outlier _____	4. The difference from the greatest and smallest numbers in a set of data.
e. Survey Question _____	5. Used to collect information about a group.

2. Emily did a survey about the favorite sport of the students in her class. She collected the data in the following tally table. Use the table to solve the problem listed here.

Favourite Sport	
Sport	**Tally**
Baseball	𝍸 |
Basketball	𝍸 |||
Football	𝍸 ||
Soccer	𝍸 |
Boxing	|

a. Make a frequency table of the collected data:

Sport	**Frequency**

b. Organize the survey data in a dot plot:

c. What is the range?

d. Is there an outlier of the data? Which one?

e. Which sport has the greatest frequency?

f. How many students were surveyed?

3. Make a dot plot using the frequency table about bicycles per household provided below. Solve the problems listed here.

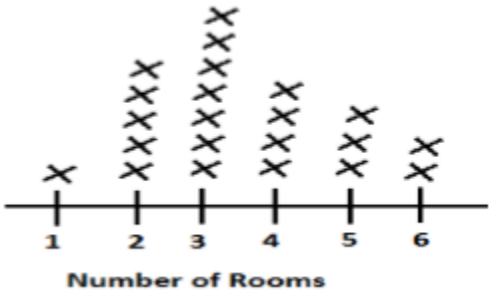
Bicycles Survey	
Number of Bicycles	Frequency
0	5
1	6
2	7
3	5
4	0
5	1

a. Organize the survey data in a dot plot:

b. What is the range of the number of bicycles?

c. Identify the outlier.

4. Emma did a survey among her friends to find out how many rooms they have in their homes. The data is presented in the dot plot below. Use the dot plot to solve the following problems.

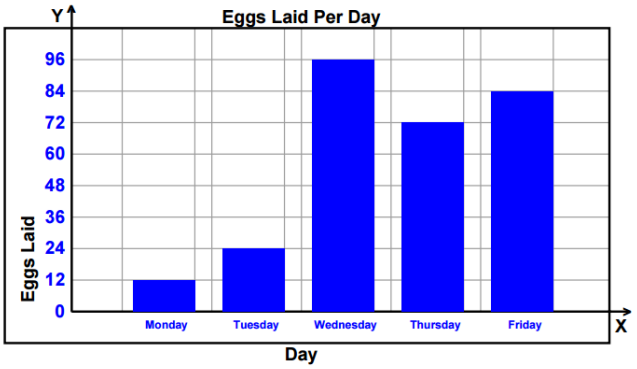


a. What is the range of number of rooms?

b. Which count of rooms has the least frequency?

c. How many friends were surveyed?

5. Answer the following questions based off the bar graph.



a. Did the number of eggs laid increase or decrease between Monday and Tuesday?

b. Were more eggs laid on Thursday or Friday?

c. Which day had the fewest number of eggs laid?

Day 2

Name: _____ Date: _____ Period: _____

Vocabulary Notes

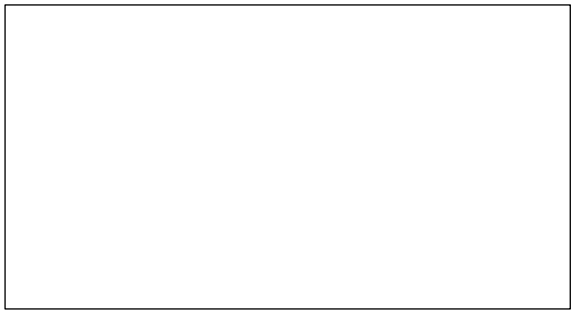
Box plot	Percent bar graph	Interquartile range (IQR)
Data	Relative frequency table	Median
Histogram	Variability	Numerical data
Mean	Categorical data	Range
Mode	Dot plot	Stem-and-leaf plot

1. _____: a graphical representation showing the five-number summary of data (minimum, lower quartile, median, upper quartile, maximum)
   Helpful hint: _____
   Visual:

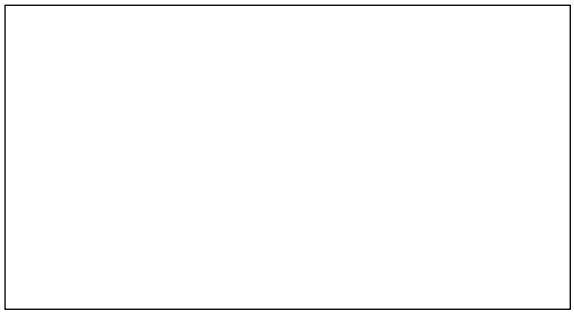
2. _____: data that represents the attributes of a group of people, events, or objects
   Helpful hint: _____
   Visual:

3. _____: information that is collected about people, events, or objects
   Helpful hint: _____

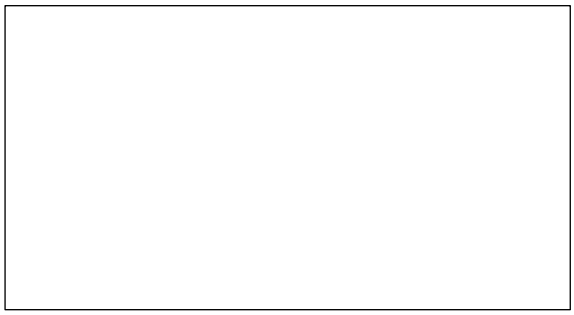
Visual:



4. _____: a graphical representation to organize data that uses dots (or Xs) to show the frequency (number of times) that each number occurs
   Helpful hint: _____
   Visual:

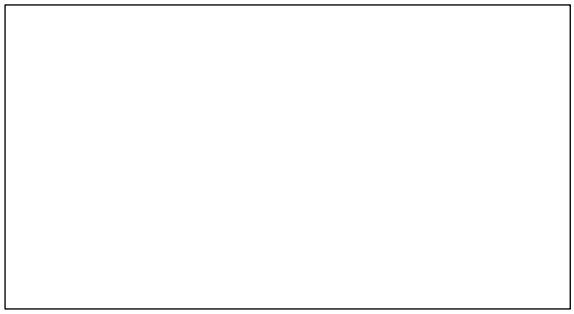


5. _____: a graphical representation of adjacent bars with different heights or lengths used to represent the frequency of data in certain ranges of continuous and equal intervals
   Helpful hint: _____
   Visual:



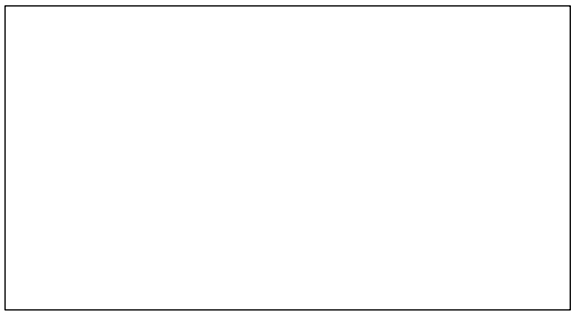
6. _____: difference between the first quartile and the third quartile of a set of numbers (IQR = Q3 – Q1)
   Helpful hint: _____

Visual:

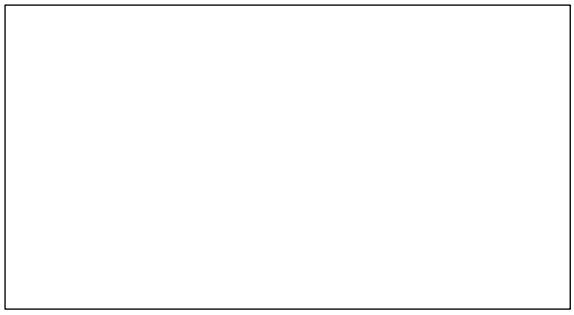


7. _____: average of a set of data found by finding the sum of a set of data and dividing the sum by the number of pieces of data in the set
   Helpful hint: _____
   Visual:

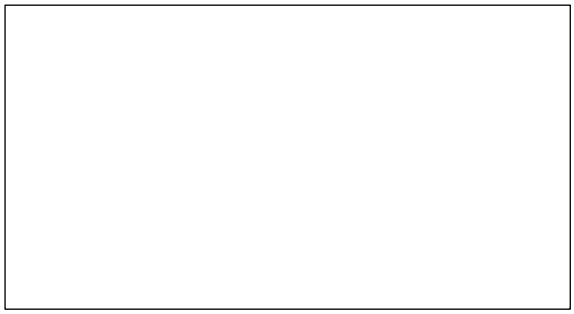
8. _____: the middle number of a set of data that has been arranged in order from greatest to least or least to greatest
   Helpful hint: _____
   Visual:



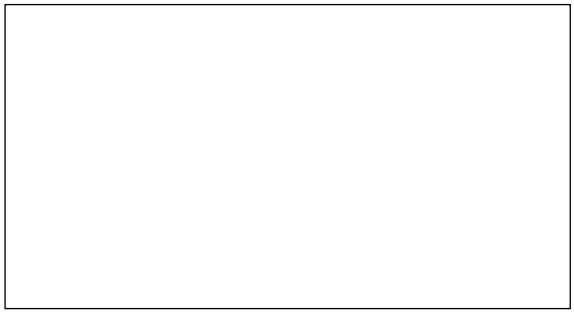
9. _____: the most frequent piece of data in a set of data
   Helpful hint: _____
   Visual:



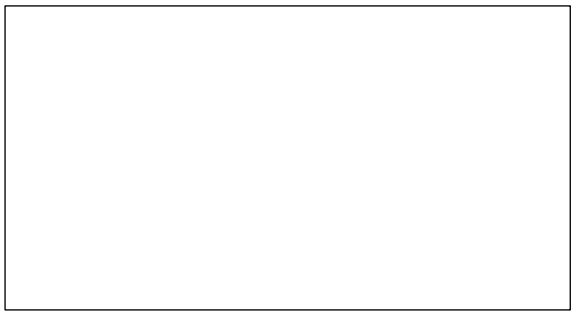
10. _____: data that represents values or observations that can be measured and placed in ascending or descending order
    Helpful hint: _____
    Visual:



11. _____: a graphical representation to organize data that uses solid bars that do not touch each other to show the frequency (number of times that each category occurs as a percentage as compared to the related part(s) or to the whole
    Helpful hint: _____
    Visual:

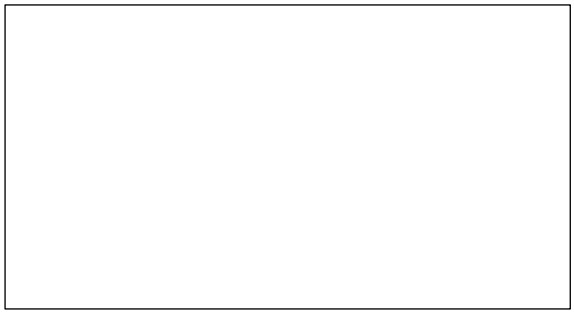


12. _____: the difference between the greatest number and least number in a set of data
    Helpful hint: _____
    Visual:

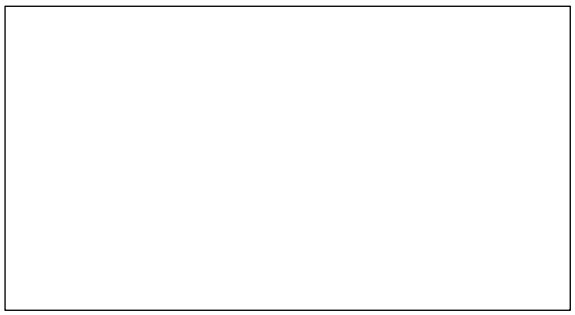


13. _____: a table to organize data that lists categories and the frequency (number of times) that each category occurs as a percent
    Helpful hint: _____

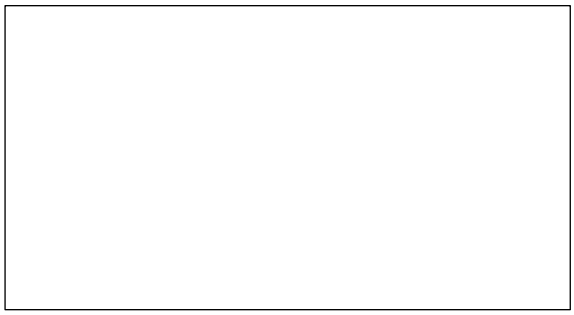
Visual:



14. _____: a graphical representation used to analyze and compare groups or clusters of numerical data by separating one place value from another place value of a data set. The larger of the two place values is called the stem and the smaller of the two place values is called the leaf.
    Helpful hint: _____
    Visual:



15. _____: measure of the spread of a set of data.
    Helpful hint: _____
    Visual:



Day 3

Name: _____ Date: _____ Period: _____

Mean, Median, Mode, Range, IQR Practice

TEKS 6.12C, 6.12D

_____: average of a set of data found by finding the sum of a set of data and dividing the sum by the number of pieces of data in the set.

_____: the middle number of a set of data that has been arranged in order from greatest to least or least to greatest

_____: most frequent piece of data in a set of data

_____: the difference between the greatest number and least number in a set of data

_____: difference between the first quartile and the third quartile of a set of numbers (IQR = Q3 – Q1)

I Do: Find the mean, median, mode, range, and IQR of the following data sets:

1) 14, 8, 7, 20, 11

Step 1: Write numbers in order from greatest to least:

Step 2: Find the median: _____

Step 3: Find the mode: _____

Step 4: Find the range: _____

Step 5: Find the IQR (find the median of the upper half of the data for Q3, find the median of the lower half of the data for Q1, subtract Q3 – Q1)

IQR: _____

Step 6: Find the mean (add all of the numbers together and divide by how many numbers there are)

Mean: _____

2) 16, 12, 7, 19, 10, 9, 18
   Step 1: Write numbers in order from greatest to least:

   Step 2: Find the median: _____

   Step 3: Find the mode: _____

   Step 4: Find the range: _____

   Step 5: Find the IQR (find the median of the upper half of the data for Q3, find the median of the lower half of the data for Q1, subtract Q3 – Q1)

   IQR: _____

   Step 6: Find the mean (add all of the numbers together and divide by how many numbers there are)

   Mean: _____

We Do:

3) 11, 20, 9, 16, 16, 18, 20, 18
   Step 1: Write numbers in order from greatest to least:

   Step 2: Find the median: _____

Step 3: Find the mode: _____

Step 4: Find the range: _____

Step 5: Find the IQR (find the median of the upper half of the data for Q3, find the median of the lower half of the data for Q1, subtract Q3 – Q1)

IQR: _____

Step 6: Find the mean (add all of the numbers together and divide by how many numbers there are)

Mean: _____

4) 10, 6, 19, 7, 18, 16, 6, 7
Step 1: Write numbers in order from greatest to least:

Step 2: Find the median: _____

Step 3: Find the mode: _____

Step 4: Find the range: _____

Step 5: Find the IQR (find the median of the upper half of the data for Q3, find the median of the lower half of the data for Q1, subtract Q3 – Q1)

IQR: _____

Step 6: Find the mean (add all of the numbers together and divide by how many numbers there are)

Mean: _____

You Do:

CUP STACKING CHALLENGE

Round #1	# of Cups

Work Space

Class Data			
Mean	Median	Mode	Range

Work Space

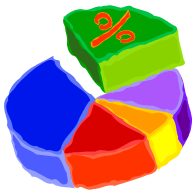
Round #2	# of Cups

Class Data			
Mean	Median	Mode	Range

Day 4

Name _____Date: _____ Period: _____

The **Power** of Statistics



It is important to be careful as we encounter statistics because sometimes they can be manipulated unfairly to sway opinions! **How can statistics be manipulative?**

How can we ensure that a statistical study is valid? What are some ***key words*** look for?

Name: _____ Date: _____ Period: _____

Article Analysis

Using the articles that have been given to you, work with your partner to analyze them. Read through each article and answer the following questions.

1. Write a 2-3 sentence *article summary* on the main points of your article.

2. What statistics (points made using data) are used in my article? Example: EXAMPLE List all statements here:

3. Are the statistics in your article reliable? Why or why not? *(use some language from the other side of this page)*

4. Would you say that the statistics in your article are powerful? Do they make the point stronger or sway the reader's opinion?

5. In the area below or on a separate paper, represent one of the pieces of information in your article graphically *(choose which type of graph would work best for this!)*

Day 5

Name: _____ Date: _____ Period: _____

TEKS 6.13A Dot Plots

1. How many siblings (brothers and sisters) does our class have?

a) Order the data from least to greatest: _____

b) Draw a dot plot for the data.

c) Describe the spread, center, and shape of the data distribution:

Spread: _____

Center: _____

Shape: _____

d) Find the mean, median, mode, and range of the data.

Mean: _____

Median: _____

Mode: _____

Range: _____

2) Kate asked some friends how many movies they saw last winter.

Movies Seen Last Winter
0, 1, 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 5, 5, 5, 6, 6, 7, 7, 7, 8, 8, 9, 9, 17

a) Draw a dot plot for the data:

b) Describe the spread, center, and shape of the data distribution:

Spread: _____

Center: _____

Shape: _____

c) Find the mean, median, mode, and range of the data.

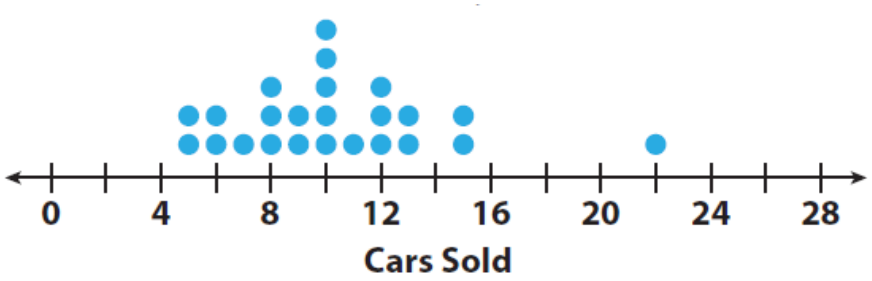
Mean: _____

Median: _____

Mode: _____

Range: _____

3) Use the dot plot of the number of cars sold at a car dealership per week during the first half of the year.



a) Find the mean, median, mode, and range of the data.

Mean: _____

Median: _____

Mode: _____

Range: _____

b) How many cars are sold in a typical week at the dealership? Explain.

_____

_____

Weekly Math Homework 1

Name: _____ Period: _____

EXAMPLE

$$\begin{array}{r} 7.25 \\ 12\overline{)87.00} \\ 84 \\ \hline 30 \\ -24 \\ \hline 60 \\ -60 \\ \hline 0 \end{array}$$

Write a decimal point and a zero in the dividend.

Place a decimal point in the quotient.

Add more zeros to the dividend if necessary.

Find the quotient.

1. $15\overline{)42}$ _____ **2.** $75\overline{)93}$ _____ **3.** $52\overline{)91}$ _____ **4.** $24\overline{)57}$ _____

Mean, Median, Mode, Range:

1. Spencer surveyed five of his friends to find out how many pets they have. His results are shown in the table. What is the mean number of pets? (Explore Activity 1)

Number of Pets				
Lara	**Cody**	**Sam**	**Ella**	**Maria**
3	5	2	4	1

$$\text{Mean} = \frac{\text{sum of data values}}{\text{number of data values}} = \frac{\square}{\square} = \square$$

The mean number of pets is _____

2. The following are the weights, in pounds, of some dogs at a kennel: 36, 45, 29, 39, 51, 49. (Example 1)

a. Find the median. _____

3. **a.** Find the mean and the median of this data set: 9, 6, 5, 3, 28, 6, 4, 7. (Explore Activity 2)

Box Plots: **1) Use the data set of the heights of several different students.**

Students' Heights (in.)
46 47 48 48 56 48
46 52 57 52 45

a) Order the data from least to greatest: _____

b) Find the median:_____

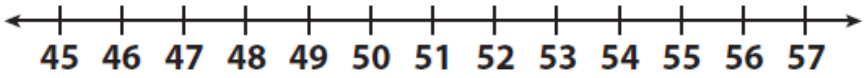
c) Find the lower quartile: _____

d) Find the upper quartile: _____

e) Find the IQR: _____

f) Find the range: _____

g) Draw a box plot for the data.



2) The daily high temperatures for some days last month are shown.

Daily High Temperatures (°F)
85 78 92 88 78 84
80 94 89 75 79 83

a) Order the data from least to greatest: _____

b) Find the median:_____

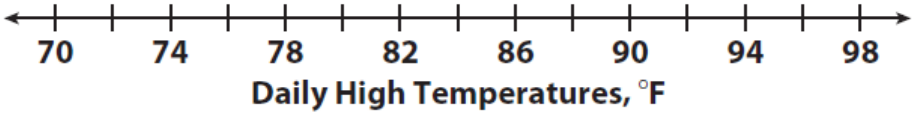
c) Find the lower quartile: _____

d) Find the upper quartile: _____

e) Find the IQR: _____

f) Find the range: _____

g) Draw a box plot for the data.



Day 6 & 7

Name: _____ Period: _____

TEKS 6.12A: Stem-and-Leaf plots

1) The 12 members of the high-school basketball team have a free-throw drill. Each player attempts 50 free throws. The number of free throws made by each player is given.

44, 35, 29, 25, 33, 36, 35, 23, 30, 29, 19, 32

a) Order the data from least to greatest:_____

b) Use the tens digits as stems. Use the ones digits as leaves. Write the leaves in increasing order.

Free Throws Made

Stem	**Leaves**

Key: 2 | 3 means 23

2) Wendy kept track of the number of text messages she sent each day for two weeks.

35, 20, 46, 29, 27, 33, 15, 52, 27, 30, 35, 24, 34, 42

a) Order the data from least to greatest:_____

b) Use the tens digits as stems. Use the ones digits as leaves. Write the leaves in increasing order.

Wendy's Text Messages *Key:*

Stem	**Leaves**

3) The number of home runs a baseball player hit in each season he played is shown in the stem-and-leaf plot.

Home Runs

Stem	Leaves
0	0 5 5 7 7 8 9
1	0 0 7 9
2	
3	
4	4

Key: 1|7 means 17

a) Order the data from least to greatest:

_____

b) How many seasons are included in the stem-and-leaf plot?_____

c) Find the median:_____

d) Find the mode:_____

e) Find the range:_____

f) Find the mean:_____

4) Val's quiz scores are shown in the stem-and-leaf plot.

Stem	Leaves
3	7 8 8 9
4	3
5	0 1 2 2 3 7 8
6	2 4 4 5

Key: 3|7 means 37

a) Order the data from least to greatest:

_____

b) How many scores are included in the stem-and-leaf plot?_____

c) Find the median:_____

d) Find the mode:_____

e) Find the range:_____

5) The ages of the volunteers at a local food bank are shown below.

Stem	Leaf
3	3 5 7 9
4	8 9
5	1 1 2 3 3 5 6
6	0 3 7 9

Key: $\frac{3}{5}$ means 35

a) Order the data from least to greatest:

_____

b) How many volunteers are included in the stem-and-leaf plot?_____

c) Find the median:_____

d) Find the mode:_____

e) Find the range:_____

Day 8 & 9

Name: _____ Period: _____

TEKS 6.12A: Histograms

Histogram is a type of _____ _____ whose bars represents the _____ of numeric data within _____.

Example 1:

A birdwatcher counts and records the number of birds at a birdfeeder every morning at 9:00 for several days.

12, 3, 8, 1, 1, 6, 10, 14, 3, 6, 2, 1, 3, 2, 7

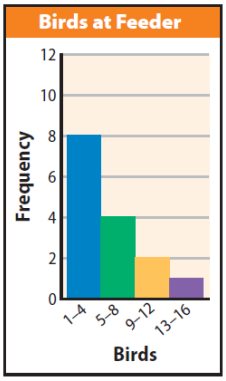
a) Order data from least to the greatest:_____.

b) Divide the data into equal-sized intervals.

Make a frequency table:

Interval	Frequency
1 - 4	
5 - 8	
9 - 12	
13 - 16	

c) Make a histogram:



d) What does the shape of the distribution tell you about the situation?

_____

_____.

Example 2:

Kim has started rating each movie she sees using a scale of 1 to 10 on an online site. Here are her ratings so far:

6, 9, 8, 5, 7, 4, 8, 8, 3, 7, 8, 7, 5, 1, 10

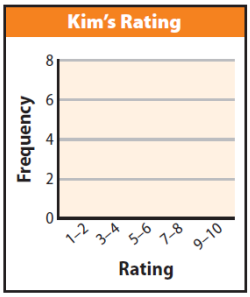
a) Order data from least to the greatest:_____.

b) Divide the data into equal-sized intervals.

Make a frequency table:

Interval	Frequency
1 - 2	
3 - 4	
5 - 6	
7 - 8	
9 - 10	

c) Make a histogram:



You try:

3) Ed counted the number of seats available in each café in his town. Complete the frequency table and the histogram.

18, 20, 22, 26, 10, 12, 16, 18, 7, 8

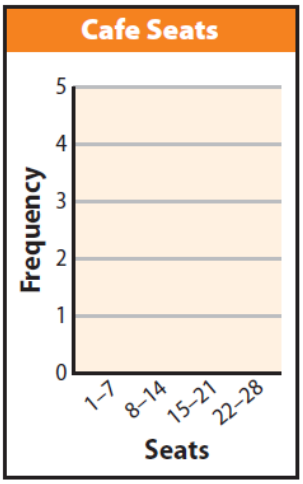
a) Order data from least to the greatest:_____.

b) Divide the data into equal-sized intervals.

Make a frequency table:

Interval	Frequency
1 – 7	
8 – 14	
15 – 21	
22 - 28	

c) Make a histogram:



4) An amusement park employee records the ages of the people who ride the new roller coaster during a fifteen-minute period.

Ages of riders: 47, 16, 16, 35, 45, 43, 11, 29, 31, 50, 23, 18, 18, 20, 29, 17, 18, 48, 56, 24, 18, 21, 38, 12, 23.

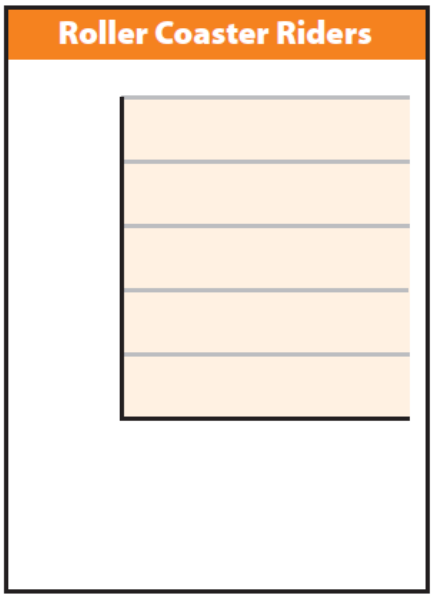
a) Order data from least to the greatest:_____.

b) Divide the data into equal-sized intervals.

Make a frequency table:

Interval	Frequency
10 – 19	
20 – 29	

c) Make a histogram:



Day 10 & 11

Name: _____ Period: _____

TEKS 6.12A: Box Plots

1) The RBIs (runs batted in) for 15 players from the 2010 Seattle Mariners are shown

Mariners' RBIs
15 51 35 25 58 33 64
43 33 29 14 13 11 4 10

h) Order the data from least to greatest: _____

i) Find the median (middle) :_____

j) Find the lower quartile (the median of the lower half of the data) _____

k) Find the upper quartile (the median of the upper half of the data) _____

l) Find the IQR (upper quartile – lower quartile): _____

m) Find the range (greatest – least): _____

n) Draw a box plot for the data.

2) The heights of several students are shown. Make a box plot for the data.

Students' Heights (in.)					
60	58	54	56	63	61
65	61	62	59	56	58

a) Order the data from least to greatest: _____

b) Find the median (middle) :_____

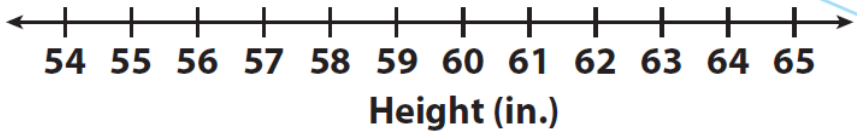
c) Find the lower quartile (the median of the lower half of the data) _____

d) Find the upper quartile (the median of the upper half of the data) _____

e) Find the IQR (upper quartile – lower quartile): _____

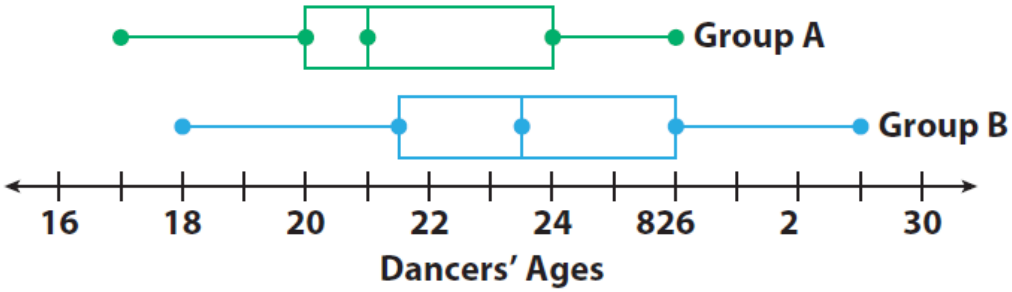
f) Find the range (greatest – least): _____

g) Draw a box plot for the data.



TEKS 6.12A: Box Plots

3) The box plots compare the ages of dancers in two different dance troupes.



a) Find the IQR for each set of data.

Group A: IQR = Upper quartile – Lower quartile

Group B: IQR = Upper quartile – Lower quartile

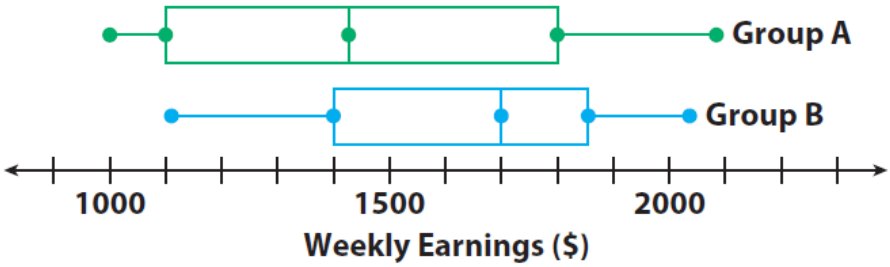
b) Compare the IQRs. How do the IQRs describe the distribution of the ages in each group?

_____

_____

_____.

4) The box plots compare the weekly earnings of two groups of salespeople from different clothing stores.



a) Find the IQR for each set of data.

Group A: IQR = Upper quartile – Lower quartile

Group B: IQR = Upper quartile – Lower quartile

b) Compare the IQRs. How do the IQRs describe the distribution of the weekly earnings in each group?

_____

_____

_____.

Weekly Math Homework 2

Name: _____ Period: _____

Remember

Measures of Center	
Mean	**Add** all of the numbers together and **divide** by how many numbers there are.
Median	The **middle** number. If there are two numbers in the middle, add them up and divide by 2.
Mode	The number that occurs the **most**. If there isn't one, write **no mode**.
Range	**Subtract** the largest number minus the smallest number.

Measures of Center:

1) Find the mean, median, mode and range of the data set.

2, 5, 9, 11, 17, 19

a) Mean: _____

b) Median:_____

c) Mode: _____

d) Range: _____

Box Plots:

2) Make a box plot for the data set.

36, 42, 44, 52, 61, 70, 78

a) Find the median (middle) :_____

b) Find the lower quartile (the median of the lower half of the data) _____

c) Find the upper quartile (the median of the upper half of the data) _____

d) Find the IQR (upper quartile – lower quartile): _____

e) Find the range (greatest – least): _____

f) Draw a box plot for the data.

Dot Plots:

3) A baseball team scored the following number of runs over a 10-game period:

6, 6, 8, 5, 4, 6, 4, 3, 8, 4

a) Make a dot plot for the data.

b) Find the mean, median, mode, and range of the data.

Mean: _____

Median: _____

Mode: _____

Range: _____

Stem-and-Leaf Plots:

4) Wendy kept track of the number of text messages she sent each day for two weeks.

Wendy's Text Messages

35, 20, 46, 29, 27, 33, 15, 52, 27, 30, 35, 24, 34, 42.

a. Complete the stem-and-leaf plot.
First, order the data from smallest to largest.

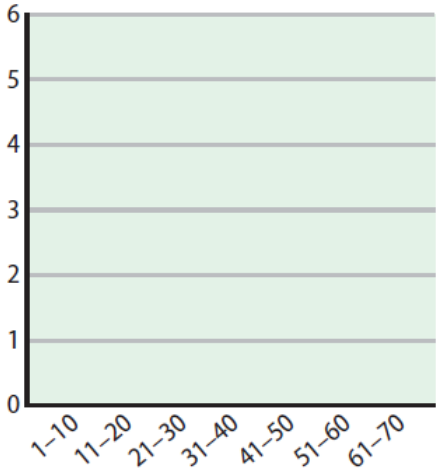
Wendy's Text Messages

Stem	Leaves

Histograms:

5) Make a histogram for the data set.
First, order the data from least to greatest.

6	23	45	62	19
55	48	22	39	54
47	39	16	48	12
7	14	32	18	4



Key:

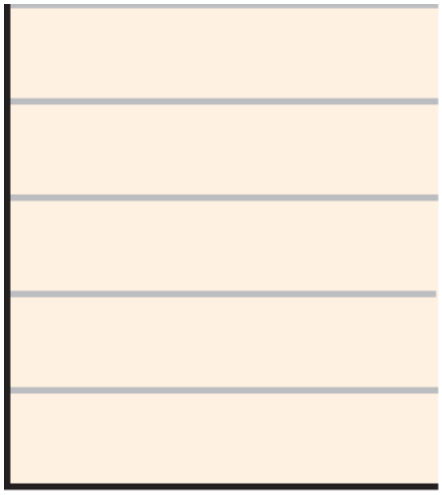
Day 12 & 13

Name: _____ Date: _____ Period: _____

TEKS 6.12D Categorical Data

1. Make a histogram for the data.

6	23	45	62	19
55	48	22	39	54
47	39	16	48	12
7	14	32	18	4



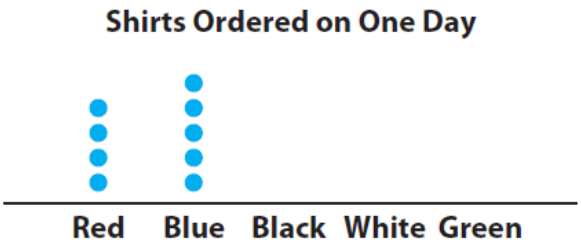
Order the data from least to greatest:

Divide data into equal-sized intervals and make a frequency table:

Interval	Frequency

2. Pamela sells red, blue, black, white, and green shirts online. One day Pamela received orders for 4 red, 5 blue, 6 black, 6 white, and 3 green shirts.

Complete the dot plot of Pamela's shirt orders for the day.



Which shirt color or colors were the most and least popular that day?

Most: _____ Least: _____ Mode(s) of the data: _____

Is it possible to find the mean or median of Pamela's data set? Explain.

The **relative frequency** of a category is the _____ of its frequency to the _____ of the frequencies for all categories. Relative frequency is often written as a fraction or a percent.

3. What is our class's favorite summer sport?

Favorite Summer Sport						
Sport	Basketball	Baseball	Swimming	Soccer	Volleyball	Football
Frequency						

Step 1: Find the sum of the frequencies for all categories.

Step 2: Write the relative frequency of each category as a fraction of the total and as a percent.

Favorite Summer Sport						
Sport	Basketball	Baseball	Swimming	Soccer	Volleyball	Football
Relative Frequency						

You try:

4. Frida has 40 dimes, 20 pennies, 10 nickels, and 10 quarters in her coin jar. Make a relative frequency table of the coins in the jar.

Coins in a Jar				
Type of Coin				
Frequency				

Step 1: Find the sum of the frequencies for all categories.

Step 2: Write the relative frequency of each category as a fraction of the total and as a percent.

Coins in a Jar				
Type of Coin				
Relative Frequency				

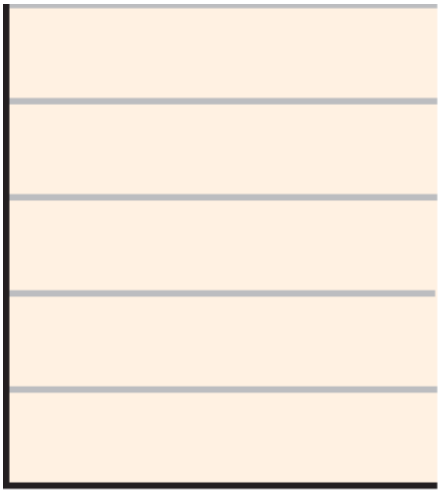
Name: _____ Date: _____ Period: _____

TEKS 6.12D Categorical Data

1. The table shows the results of a survey taken in Mr. Jaime's music class about the student's favorite musical instruments. Make a percent bar graph. Then find the mode and describe how the data are distributed.

Favorite Musical Instrument						
Instrument	Drums	Guitar	Bass	Saxophone	Trumpet	Clarinet
Frequency	6	5	3	3	2	1
Relative Frequency						

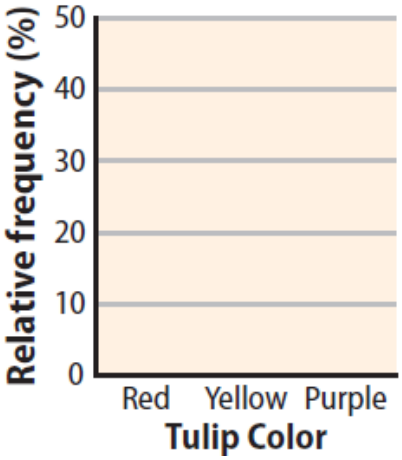
Make a bar graph of the relative frequencies.



What is the instrument mentioned most often? _____

2. Yuliana is growing tulips in her garden. She has 24 red tulips, 11 yellow tulips, and 15 purple tulips. Make a percent bar graph and describe the distribution.

Step 1: Find the relative frequencies of the data:



Step 2: Graph the relative frequencies and determine the mode:

Mode: _____

You try:

3. Ms. Mitchell surveyed her class about their favorite summer activity. Four students chose reading, 7 chose movies, 7 chose sports, and 5 chose travel.

   Step 1: Make a dot plot of the data.

Favorite Summer Activities

_____

Reading Movies Sports Travel

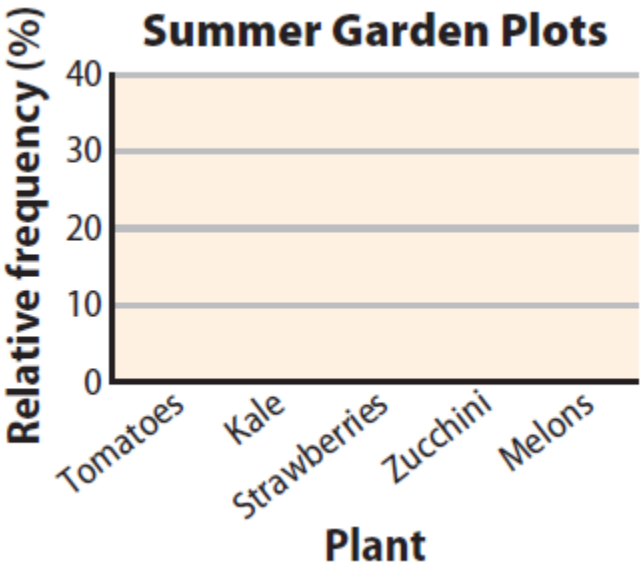
   Step 2: Identify the mode(s) of the data set. _____

4. The garden club is planning their spring and summer garden. They have 20 plots. Tomatoes will be in 3 plots, kale will be in 5 plots, strawberries will be in 6 plots, zucchini will be in 2 plots, and melons will be in 4 plots.

   Step 1: Make a relative frequency table of the data that shows both fractions and percents.

Summer Garden Plots					
Plant	Tomatoes	Kale	Strawberries	Zucchini	Melons
Relative Frequency					

Step 2: Make a percent bar graph of the relative frequencies of the garden plots.



Day 14

Name: _____ Date: _____ Period: _____

Graph Differentiation Recording Sheet

Round 1: Write the original data set:	
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:

Round 2: Write the original data set:	
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:

Round 3: Write the original data set:	
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:

Round 4: Write the original data set:	
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:
Graph _____ is a _____.	The statement that best describes this graph is:

Day 15

Name: _____ Date: _____ Period: _____

Graph Determination Recording Sheet

<table>
<tr><td colspan="2">Write the data set for Round 1:</td></tr>
<tr><td>What graphical representation did you choose for Round 1?</td><td>Numerical Summaries:
Mean: _____

Median: _____

Mode: _____

Range: _____

IQR: _____</td></tr>
<tr><td colspan="2">Graphical Representation</td></tr>
<tr><td colspan="2">Write the data set for Round 2:</td></tr>
<tr><td>What graphical representation did you choose for Round 2?</td><td>Numerical Summaries:
Mean: _____

Median: _____

Mode: _____

Range: _____

IQR: _____</td></tr>
</table>

Graphical Representation

Write the data set for Round 3:

What graphical representation did you choose for Round 3?

Numerical Summaries:

Mean: _____

Median: _____

Mode: _____

Range: _____

IQR: _____

Graphical Representation

Day 16 – 19

Name: _____ Date: _____ Period: _____

Becoming Critical Analyzers of Data, 6th Grade Project

Due: _____

Project Overview:

After studying graphs, analyzing and measuring data, you will apply your knowledge to conduct your very own research study. In groups of two, you will decide on a question to conduct your study at Tafolla Middle School. You and your partner will gather the data, analyze it, describe it, and then display your findings to the class using the graphical representations we learned in class (i.e., dot plots, stem-and-leaf plots, histograms, and box plots). Project will be completed in class. If class time is misused, then work will be taken home to complete on time. **Project will be the equivalent of a test grade, 15% of your grade!**

Essential Questions:

- Why is it important to critically analyze data in a 21st century world?
- What value is there in gathering quality data?
- How do you determine a valid and reliable data source?
- How does representations and descriptions of data influence conclusions and/or predictions?

Learning Objectives: TEKS 6.12A, 6.12B, 6.12C, 6.12D, 6.13A, 6.13B

- Represent numeric data in graphs
  - Dot plots
  - Stem-and-leaf plots
  - Histograms
  - Box plots
  - Relative frequency table & percent bar graph
- Use the graphical representation to describe the data distribution
  - Center: mean, median
  - Spread: mode, range, interquartile range (IQR)
  - Shape: cluster, gap, outlier
- Summarize numeric data with numerical summaries
  - Mean, median, mode, range, interquartile range
- Interpret numeric data summarized in graphical representations
- Distinguish between situations that yield data with and without variability

Project Steps:

1. **Write a survey question**
   - Answer to question must be a number in order to yield data with variability
     - Non-example: What is your favorite tv show?
     - Example: How many minutes of TV do you watch each day?
     - Question needs to be approved by teacher before data collection
2. **Data collection**
   - Collect at least 25 data points using your research question
3. **Find the numerical summaries of the data**
   - Mean, median, mode, range, and interquartile range of your data points
4. **Represent your data**
   - Create four of the following professional mathematical graphs. Remember to give each graph a title and that the x- and y- axes are labeled and numbered appropriately for your data.
   - Required graphs:
     - 1 Histogram
     - 1 Box plot
   - Choose 2 of the following 3 graphs:
     - 1 Frequency table with percent bar graph
     - 1 Dot plot
     - 1 Stem-and-leaf plot
   - Total: 4 graphs
5. **Data Description**
   - Describe how you gathered your data using complete sentences:
     - What type of people did you ask? (Children, females, etc.)
     - Do you think your answers would be different if you asked a different group of people? (Adults, males, etc.)
6. **Data Interpretation**
   - Use at least 4 sentences to describe which of your 4 graphical representations describes your data set the best and why. Use at least 4 sentences to describe which of your 4 graphical representations describes your data set the worst and why.
7. **Data Display**
   - Decide how you want to display your data:
     - You may choose:
       - Powerpoint
       - Poster board
       - Prezi
       - Alternate approved presentation, such as:
         - News article
         - Brochure
         - Your own creative idea
8. **Data Presentation**
   - Present your findings to the class

Super Star Challenge (Extra Credit Opportunity):

You and your partner can choose to present your data using multiple mediums. For example, a powerpoint and a brochure. The mediums that you create will be shared with the class during your data presentation. Let me know if you are taking on this challenge before presentation day so I can have all materials prepared for the class before you present!

Products and Project Due Dates (dates subject to change)
**Each of the following steps must be approved before you move on to the next step.*

Steps	Due Date	Approval Signature
Step 1 Survey Question		
Step 2 Data Collection		
Step 3 Numerical Summaries		
Step 4 Graphical Representations		
Step 5 Data Description		
Step 6 Data Interpretation		
Step 7 Data Display		
Step 8 Data Presentation		

Need help getting started?
Example questions to get started:

- How far away do the students at Tafolla MS live from _____?
- How long does it take students to get to Tafolla MS?
- How many minutes a week does each student at Tafolla MS spend watching tv?
- How many siblings does each student at Tafolla MS have?
- How many video game consoles does each student at Tafolla MS own?
- How many boys are there in 6^{th} grade classrooms at Tafolla MS?
- How many personal electronic devices do you own?
- How many bones have you broken in your lifetime?

Step 1: Survey Question

Names of Group Members: 1. _____ 2. _____

Brainstorm Ideas:

What would you like to conduct a study on? What would you like to know about our student population at Tafolla MS?

Use this space to divide responsibilities of this project for you and your partner. For example, I will do the histogram and the stem-and-leaf plot, my partner will do the box plot and the dot plot. (Look at all the steps of the project on the previous pages):	
My Responsibility:	**My Partner's Responsibility:**
I agree to complete the above parts to the project. Incompletion of the above will result in the loss of points on my personal grade. ***Signed,***	**I agree to complete the above parts to the project. Incompletion of the above will result in the loss of points on my personal grade.** ***Signed,***

Final Question:

_____

_____

_____

Teacher Approval:_____

Step 2: Data Collection

Write down your survey question here:

_____

_____

_____

Interview Form

Name:	**Response:**
1)	
2)	
3)	
4)	
5)	
6)	
7)	
8)	
9)	
10)	
11)	
12)	
13)	
14)	
15)	

16)	
17)	
18)	
19)	
20)	
21)	
22)	
23)	
24)	
25)	

Step 3: Numerical Summaries

Write your data list here:

Order your data from least to greatest:

Determine the measures of center and measures of spread. Show all your work:

Mean: _____

Median: _____

Mode: _____

Range: _____

1st Quartile: _____

3rd Quartile: _____

Interquartile Range: _____

Work Space: (if more space is needed, staple scratch work to back of packet)

Step 4: Graphical Representations

Use the following space to create your four graphical representations. The final draft will be done on individual sheets of paper per graph.

Graph #1: _____

Graph #2: _____

Graph #3: _____

Graph #4: _____

Step 5: Data Description

Answer the following questions using complete sentences.

1) What two things stood out about your data?

   1. _____

      _____

   2. _____

      _____

2) What type of people did you gather your data from? (students, all females, etc.)

_____

_____

3) Do you think your answers would be different if you asked a different group of people? (adults, males, etc.)

_____

_____

Step 6: Data Interpretation

Use <u>at least 4 sentences</u> to describe which of your 4 graphical representations describes your data set <u>the best</u> and why. (IF more space is needed, use scratch paper and staple to the back of the packet.)

The graphical representation that best describes our data is _____ because

_____

_____

_____

_____

Use at least 4 sentences to describe which of your 4 graphical representations describes your data set the worst and why. (IF more space is needed, use scratch paper and staple to the back of the packet.)

The graphical representation that describes our data the worst is _____ because

_____

_____

_____

_____

Day 20 - 23

*** These days are for data display and data presentation, see Rubric***