Brockton High School
Content: Math I
Week of: June 8 to June 12, 2020

Greetings Math I Students! We hope you are safe and well with your families! This assignment is for this week, use your time wisely. You do not have to complete this in one sitting. Here is the lesson plan for this week:

Goals for This Week

Learning Objectives:

Students will be able to:

1. Compare the standard deviation of data sets.
2. Analyze and interpret data graphically and numerically.
3. Determine which measure of central tendency and spread is most appropriate to describe a data set.

(Standards S.ID.2 and S.ID.4)

Literacy Objectives:

Students will be able to:

1. Explain the logic of an argument or solution.
2. Read, break down, and solve a word problem.
3. To detect the fallacy in an argument or proof.
4. Create, interpret and explain a table, chart or graph.

(https://www.bpsma.org/schools/brockton-high-school/about-us/mission-literacy-charts)

Standards for Mathematical Practice:

Students should always look to develop the following habits of mind when working on mathematics:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Carnegie Learning (use with Carnegie Resources provided below)
(Log-in through Clever – see below)

Instructional Video Links: Please watch the video below to help guide you.

- Overview Video: Comparing Data Sets

Printable Resources:

Please see the attached lesson document Daring to Compare – Comparing Data Sets

Practice Activities:

On-Line:
All students now have access to an on-line learning program called Carnegie Learning/Mathia!

- If you are new to Mathia: Please see the log-in information below
- If you can get online, please complete the lessons below from **IM 1 Mod 5: Describing Distributions**
  - Numerical Summary Statistics

No Internet Access:
Please see information on printable resources.

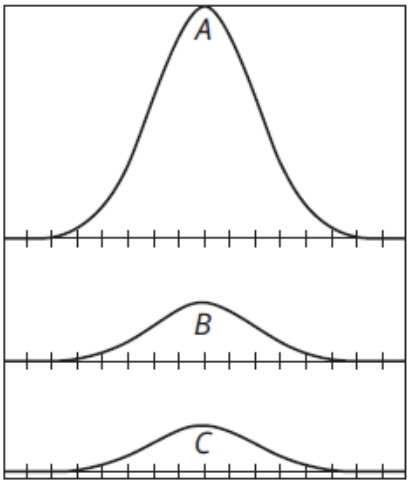
Key Terms:

- **Data set** - A data set is a list of measured information.
- **Mean** - The mean of data set is the sum of all the values of the data set divided by the number of values in the data set. The mean is also called the average
- **Median** - The median of a data set that is arranged in numerical order is either the middle value (when the number of data is odd), or the average of the two middle values (when the number of data is even).
- **Mode** - The mode is the number (or numbers) that occurs most often in a data set. If no numbers that occurs most often, the data has no mode.
- **Range** - The range of a data set is the difference between the greatest number and the least number in the data set.
- **Outlier** – An outlier is a data value that is much less or much greater than the rest of the other values in the data set.

Extension Activities:
See *Stretch* on page M4-44.

A normal curve is a bell-shaped curve that is symmetric about the mean of the data.

Normal curves *A*, *B*, and *C* represent the battery lives of a population of cell phones of comparable models from three different companies. The normal curves represent distributions with standard deviations of 0.1, 0.4, and 0.5.



1. Match each standard deviation value with one of the normal curves and explain your reasoning.

Log-in Information

1. Log-in to Clever
2. Click on the Carnegie Learning logo

Additional Support

Email: Please email your math teacher with specific questions.	Office Hours: For a list of office hours for all BHS Math teachers, please click here. Your teacher is available to help you during their scheduled office hours.

3

Daring to Compare

Comparing Data Sets

Warm Up

Determine if the distribution of each data set is symmetric, skewed left, or skewed right.

1. 4, 4, 7, 7, 7, 8, 8, 8, 8, 9, 9, 9, 12, 12

2. 0, 2, 10, 10, 11, 11, 11, 12, 12, 12, 13, 13

3. 40, 60, 60, 70, 70, 70, 80, 80, 100

4. 20, 20, 22, 23, 23, 24, 24, 24, 42, 50

Learning Goals

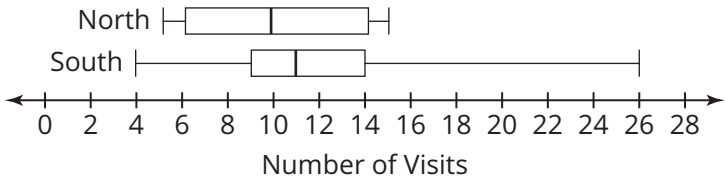
- Compare the standard deviation of data sets.
- Analyze and interpret data graphically and numerically.
- Determine which measure of central tendency and spread is most appropriate to describe a data set.

You know how to determine the most appropriate measure of center and spread to describe a data set based on its distribution. How can you use what you know to compare data sets in problem situations?

Stats on Cats

The Humane Society records the number of different visits from potential families a sample of 25 cats from each of their two locations received before being adopted. The box-and-whisker plots display the collected data.

Visits to Cats Before Being Adopted



1. Yumi, Mia, and Sloane are trying to determine which shelter's cats receive fewer visits before being adopted. Yumi says the mean and standard deviation of the data for the North shelter should be compared to the median and IQR of the data from the South shelter. Mia says the median and IQR of the data from each shelter should be compared. Sloane says the mean and standard deviation of the data from each shelter should be compared. Who's correct? Explain your reasoning.

ACTIVITY
3.1 Comparing Students

Ms. Webb, the spelling bee coach, is preparing her class for their first spelling bee scrimmage. She needs to determine which student should be the spelling bee captain. The two top spelling bee students' scores are recorded in the table. Ms. Webb analyzes the scores and calculates the approximate mean score and standard deviation for each student.

Maria	Heidi
81	81
73	68
94	60
86	109
70	82
68	88
97	60
93	102
81	78
67	69
85	84
77	103
79	92
103	60
90	108

1. **Advise Ms. Webb whom she should choose to captain the spelling bee team. Explain your reasoning.**

ACTIVITY
3.2 Comparing Airlines

Data were collected from two rival airlines measuring the difference in the stated departure times and the times the flights actually departed. The average departure time differences were recorded for each month for one year. The results are shown in the table given.

Differences in Departure Times (minutes)	
My Air Airlines	Fly High Airlines
26	14
15	32
40	29
0	8
20	24
33	45
20	7
5	30
19	15
34	49
11	16
33	27

1. **You are scheduling a flight for an important meeting and you must be there on time. Which airline would you schedule with? Explain your reasoning.**

ACTIVITY
3.3 Comparing Garages

Brenda needs to get the oil changed in her car, but she hates to wait! Quick Change and Speedy Oil are two garages near Brenda's house. She decides to check an online site that allows customers to comment on the service at different local businesses and record their wait times. Brenda chooses 12 customers at random for each garage. The wait times for each garage are shown.

Wait Times (minutes)	
Quick Change	**Speedy Oil**
10 60 22 15	5 60 45 24
12 24 20 18	40 26 55 30
16 23 22 15	32 85 45 30

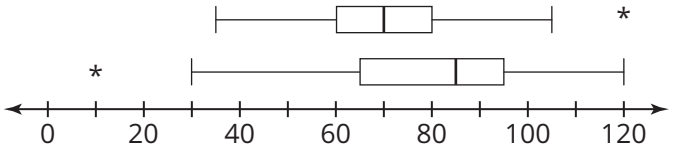
1. Based on the data gathered, which garage should Brenda choose if she is in a hurry?

NOTES

TALK the TALK

Which Came First—the Data or the Display?

1. Analyze the box-and-whisker plots shown.



a. Create a possible data set for each box-and-whisker plot.

b. Create a possible scenario that compares the two data sets.

c. Write at least two questions that could be answered using your scenario and data sets.

NOTES

2. **A data set ranges from 10 to 20. A value of 50 is added to the data set.**

   a. **Explain how the mean and median are affected by this new value.**

   b. **Which measure of central tendency and spread would you use to describe the original data set before the new value is added? Explain your reasoning.**

   c. **Which measure of central tendency and spread would you use to describe the data set after the new value is added? Explain your reasoning.**

Assignment

Write

Describe in your own words how to compare two data sets.

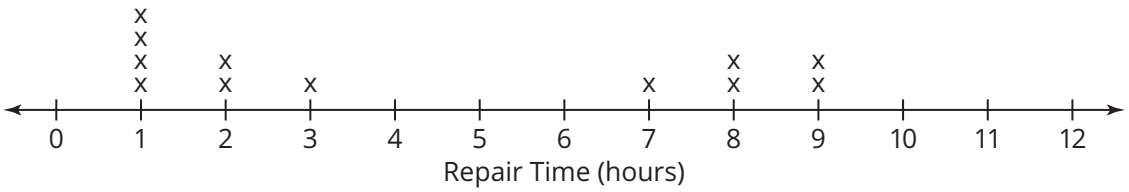
Remember

When comparing two data sets, if at least one of the data sets is skewed, you should use the median and IQR to compare the data.

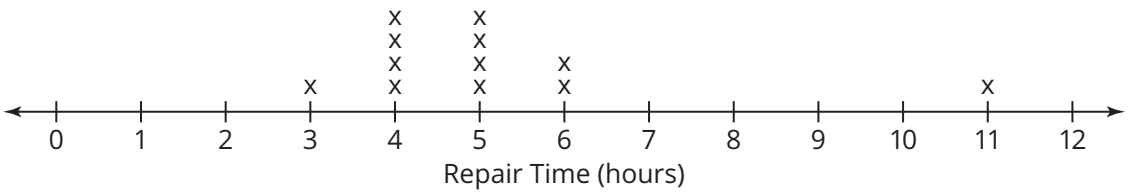
Practice

1. Dannette and Alphonso work for a computer repair company. They must include the time it takes to complete each repair in their repair log book. The dot plots show the number of hours each of their last 12 repairs took.

Dannette's Repair Times



Alphonso's Repair Times



a. Calculate the median, mean, IQR, and standard deviation of each data set.

b. Which measure of central tendency and spread should you use to compare the two data sets? Explain your reasoning.

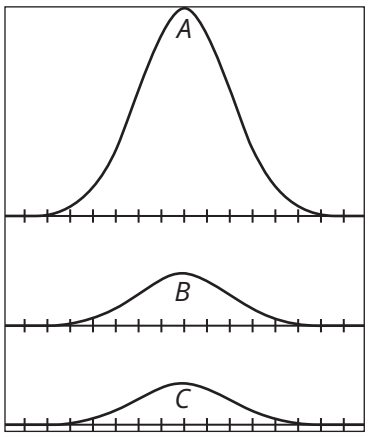
c. Determine whether there are any outliers in either data set and recalculate the IQR, if necessary.

d. Which repair person would you ask to fix your computer if you were in a hurry to have it repaired? Explain your reasoning.

Stretch

A normal curve is a bell-shaped curve that is symmetric about the mean of the data.

Normal curves *A*, *B*, and *C* represent the battery lives of a population of cell phones of comparable models from three different companies. The normal curves represent distributions with standard deviations of 0.1, 0.4, and 0.5.



1. Match each standard deviation value with one of the normal curves and explain your reasoning.

Review

1. Consider the data set: 6, 7, 7, 10, 12, 16, 16, 17, 20, 22, 22, 22, 23, 24, 24, 24, 24, 24, 25, 40.
   a. What is the five number summary and the IQR for the data set?
   b. Are there outliers for the data set? If so, what are they?
2. Solve each equation for x.
   a. $\frac{1}{5^{x-3}} = 25^{2x}$
   b. $16^{-2x} = \left(\frac{4}{64}\right)^{x+6}$