(A) Lesson Context

BIG PICTURE of this UNIT:	• How do we analyze and then make conclusions from a data set? (Math) • How do I present my data and the outcomes of my analysis? (Math) • How do I use data & statistics to make decisions? • How do I decide on the validity/reliability of my data? Of my analysis? Of my conclusions? Of my decision?		
CONTEXT of this LESSON:	Where we've been Prepare and analyze frequency histograms, frequency polygons and cumulative frequency graphs	Where we are One set of numbers we can calculate in order to analyze a data set is the measures of central tendency … how do you find the "center" of a data set?	Where we are heading How do I analyze and make conclusions from a data set, in whatever way this data gets presented?

(B) Lesson Objectives:

a. Starting from a set of raw data, calculate three measures of central tendency (mean, median & mode)
b. Determine the effect of different data distributions on measures of central tendency
c. Perform different types of calculations involving means

Opening Question ➔ *What is the purpose of finding an "average?"*

(C) Measures of Central Tendency – Define each of the following terms

a. Mean

b. Median

c. Mode

d. Range

(D) Measures of Central Tendency from a Data List – Example #1

Here are the weights of 7 students in class (measured in pounds): 150, 160, 173, 155, 160, 175, 170. Calculate the mean, median, mode and range of student weights.

(E) Measures of Central Tendency from a Data List – Example #2

Samuel is trying to determine the average height of high school male students. Because he is on the basketball team, he uses the heights of the 14 players on the team, which are given below in inches.

69, 70, 72, 72, 74, 74, 74, 75, 76, 76, 76, 77, 77, 82

(a) Calculate the mean, median, mode and range for this data set. Round any non-integer answers to the nearest tenth.

(b) Is the data set above a fair sample to use to determine the average height of high school male students? Explain your answer.

(F) Measures of Central Tendency from a Data List – Example #3

The tuition costs for ten private schools in Florida are $7568, $8650, $9225, $5880, $6720, $8840, $7820, $ 8260, $ 8432, and $8990. Find the mean & median & mode & range of tuition costs.

(G) Measures of Central Tendency from a Data List – Example #4

Example – The stem and leaf plot represents the scores on the Chapter 5 test in Mrs. Jones' geometry class. Find the mean, median, mode and range of scores.

Geometry Test Scores	
Stem	Leaf
5	6 8 9
6	1 6 9
7	4 5 77 99
8	2 4 6 7 7 8 8 9
9	1 3 3 4 4 5 5 5 7
10	0 0

(H) Measures of Central Tendency from a Data List – Example #5

The high temperatures for a 7-day week during December in Chicago were 29°, 31°, 28°, 32°, 29°, 27°, and 55°.

(a) Find the mean high temperature for the week.

(b) In this example, is this mean temperature a good representation of the data?

(c) Find the median temperature for Chicago during this week.

(d) Which measure of central tendency is a better indicator of the "central tendency" of temperatures in Chicago this week?

(I) **Measures of Central Tendency from a Data List – Example #6**

Exercise #1: Students in Mr. Ramirez's statistics class were trying to determine if people speed along a certain section of roadway. They collected speeds of 20 vehicles, as displayed in the table below.

(a) Find the mean, median, and mode for this data set.

Speed (mph)	Number of Cars
29	1
33	2
34	4
35	5
36	3
38	2
39	2
54	1

(b) The speed limit along this part of the highway is 35 mph. Based on your results from part (a), is it a fair to make the conclusion that the average driver does speed on this roadway?

Exercise #2: In Mr. Smith's Advanced Calculus Course, eight students recently took a test. Their grades were as follows: 45, 78, 82, 85, 87, 89, 93, 95

(a) Calculate the mean and median of this data set.   (b) What score is an outlier in this data set?

(c) Which value, the mean or the median, is a better measure of how well the average student did on Mr. Smith's quiz?

(J) <u>Measures of Central Tendency from a Data List – Example #7</u>

Exercise #1: Tony's Luncheonette is open six days a week. His lunch business income for the five days this week is $120, $110, $200, $300, and $140.

(a) How much money must he total for the six days if he wants to have a mean income of $200 per day?

Exercise #2: In order to pass Algebra 1 for the year, Darrien must have a mean of 65% for the four marking periods and the final, where all five grades have equal weight. Darrien has already earned a 67%, a 61%, and a 53% for the first three marking periods.

(a) What must Darrien's final two grades average (4th marking period and final exam) so that she will pass the class?

(b) What must Tony bring in on the 6th day in order to have an average of $200 for the six days?

(b) What is the minimum grade Darrien can earn in the fourth marking period and still be able to pass the overall class?

Exercise #3: At Charleston High School, a student needs a 93% average to earn an A. Chris has four scores in Algebra 1 of 94%, 93%, 96%, and 91%. What is the lowest score he could earn on the fifth test and still earn an A?

Exercise #4: High temperatures for a five day span in May happened to be consecutive even integers whose mean was 66 degrees. Find the lowest temperature of this five day span.