

The MEAN Class

The Measures of Central Tendency

Subject Area:

Math : Data Analysis, Probability, and Discrete Math

Science : Science as Inquiry and Transformation of Energy

Grade Level:

5-8

Activity Time:

45 Minutes

Device:

TI-73 Explorer™

Apps:

none (can be adapted to the TI Navigator)

Software:

TI Connect™

Accessories:

none

Other:

Meter sticks or tape measures

Overview

The students will gather the heights of all everyone in class to better learn about the measures of central tendencies. The purpose of this lesson will be a creation of a box and whiskers plot of student gathered data.

Math Objectives:

Interpret and analyze graphs of height as a function of time, Use the change in the y-coordinates of an ordered pair to determine the height of an object

GLEs:

Measurement, Data Analysis, Probability, and Discrete Math

Grade 6

#21 Demonstrate an intuitive sense of relative sizes of common units for length and area of familiar objects in real-life problems (M-2-M) (G-1-M)

#31 Demonstrate an understanding of precision, accuracy, and error in measurement (D-2-M) (M-2-M)

#32 Calculate and discuss mean, median, mode, and range of a set of discrete data to solve real-life problems (D-2-M)

Grade 7

#32 Describe data in terms of patterns, clustered data, gaps, and outliers (D-2-M)

[illegible]

Median _____

Look at the lower half of the data and find the median of that data. This is called the lower quartile: Q1

Q1 _____

Look at the upper half of the data and find the median of that data. This is called the upper quartile: Q3

Q3 _____

To calculate the mean:

Go the home screen

Press 2nd key then LIST

Using the red arrow key - arrow over to MATH

Scroll down to number 3 (or just press 3)

L1	IL2	IL3	1
150			
155			
149			
155			
155			
155			
155			
L1n=150			

Ls	OPS	MODE	CALC
1:	min()		
2:	max()		
3:	mean()		
4:	median()		
5:	mode()		
6:	stdDev()		
7:	sum()		

To calculate the mode, min and max values:

Follow the same procedure as calculating mean with the exception of the following options

- for mode choose number 5
- for min value choose number 1
- for max value choose number 2
- for range this must be calculated in the home screen after finding the min and max values

Mean _____

Mode _____

Min value _____

Max Value _____

Range _____

Constructing a box and whiskers plot:

Construct a **box and whiskers plot** of the class data in the graph below. Make sure to label and scale the x axis.



To create a box-and-whiskers plot on the calculator:

1. Press 2nd then PLOT
2. Press enter on the first plot (or go to the next available plot)
3. Press enter on ON then arrow down to Type
4. Press enter on the box-and-whiskers plot then arrow down to Xlist
5. Press 2nd LIST to retrieve the data stored in L1
6. Press enter on L1
7. Press the GRAPH soft key
8. If the graph is not visible then change the window settings or ZOOM 7
9. Using the TRACE soft key arrow right and left to find the following data
10. Write each of the following pieces of data in the spaces provided:

Mean _____ Min value _____ Max Value _____ Q1 _____ Q3 _____

Were the values of each piece of data the same as when you constructed your own box-and-whiskers above? Why or Why not?

Answer the following questions:

Is the median higher or lower than the mean?

What would cause the mean to be higher than the median? Explain.

What would cause the mean to be lower than the median? Explain.

Does the data show any outliers? Explain.

How would the data change in two years for the same group of students?

If a sample the entire school was taken, would the mean change? Why or Why not?

If a sample the entire school was taken, would the median change? Why or Why not?
