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## Box and Whisker Plots

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## Lesson Plan

Name: Beth Hall
Grade Level(s)/Subject Taught: Algebra A
Objectives: Students will learn how to create box and whisker plots through the use of the TI graphing calculator from data that they collected and entered into STAT List. Lesson reinforces the collection of basic statistics from 1-Var Stats in the graphing calculator.
Text Alignment Prentice Hall New York Math A Math Toolbox Skills Review, Page 450 Align with Statistics: Mean, Median, Mode unit
Class Structure: 40 Minutes
Number of Days: 1

### 1. Mathematical Concept (Key Idea) that modeling will be used to teach:

Measurement: Use statistical methods including the measures of central tendency to describe and compare data.

and/or

### 1.b Science Concept (Key Idea) that modeling will be used to teach

### Materials:

TI 83+ (or higher) with Application: Timer  
Variety of limericks and tongue twisters  
Data collection/output worksheet  
Rubric

Description/Vision on way(s) you might teach the planned lesson.

Prompts:

1. How will you assess the prior knowledge of the student?
2. How will you begin the lesson?
3. What are the teacher and students doing every 5-10 minutes? (Teacher Actions, and Student Actions)
4. How will you assess the learning for the lesson?

Include Teacher Role (1/2 page) and Student Role (1/2 page)

Using \_\_\_\_ TI graphing Calculators \_\_\_\_ I plan on having my students....  
(software/modeling package(s))

Prior Knowledge:

- 1) Students know how to input data into STAT Lists, and have seen the STAT PLOT window before. Students are gaining working knowledge and comfort level with the graphing calculators.

- 2) Students can generate a box and whisker plot by hand and know the 5 important features of a box and whisker plot.
- 3) Students know how to determine the Median, the Minimum, the Maximum, the first quartile and the third quartile.
- 4) Students know how to choose a consistent scale for creating plots

Assign Graphing Calculators if needed. Be sure the application TIMER is installed on each calculator.

**Launch:** Demo the Application: TIMER while reading some fun readings like limericks or tongue twisters. Use Student volunteers. Use this as a time to ensure students can use the TIMER. Have the students practice along with the volunteers in front. Briefly review discuss variability of the data, and review how the box and whisker plot shares a lot of data ( 5 key pieces ) in a quick picture (minimum, maximum, median, lower quartile, upper quartile)

Have students pair up and pick a limerick or tongue twister from provided choices.

Review the objectives, the steps the students must accomplish and the grading of the rubric.

- 1) Collect data
- 2) Input Data
- 3) Statistical Output
- 4) Generate Box & Whisker Plot using the TI Calculator
- 5) Sketch Box & Whisker Plot labeling all important features.

Teacher circulates during lesson. Teacher is called over by the students to review data input and output from the graphing calculator.

Name \_\_\_\_\_ Per \_\_\_\_ Date \_\_\_\_\_

### Box & Whisker Plots using TI 83

Objective: Collect at least 10 data points of reading duration (seconds) and length of reading (words) and create a Box and Whisker Plot using your TI Graphing Calculator.

Student Arrangement: Partners (2 students)

Supplies Needed: TI Graphing Calculator, A reading

#### Step 1: Collect Data

- 1) Turn on timer from Applications on your TI Calculator. Be sure that you can start (RUN), STOP, and reset (RST) the stopwatch.
- 2) One Partner Reads, while the second partner runs the stopwatch. Record your time data. Round to the nearest tenth of a second. Record 5 data points.
- 3) Trade jobs.
- 4) Repeat step 2. Record 5 data points.
- 5) If necessary, convert your time in minutes and seconds to seconds. Recall: 1 minute = 60 seconds.

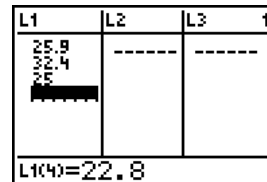
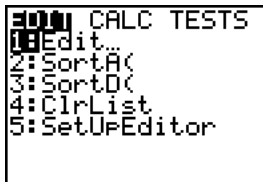


Reading Choice (title):			
Data Point	Reader (initials)	Time (minutes)	Time (seconds)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Step 2: Input data.

1) Enter your data into STAT Lists.

Use L1 for your time data.

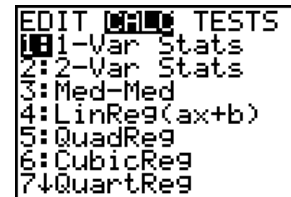


Step 3: Statistical Output

1) Record your basic statistics from your data.

Use STAT CALC 1-Var Stats.

Be sure to indicate that you are using data from L1



- 
- $\bar{x}$  =
- $\sum x$  =
- $\sum x^2$  =
- S  $x$  =
- $\sigma x$  =
- n =
- min X =
- Q1 =
- Med =
- Q3 =
- Max X =

2) Put an asterisk (\*) next to the statistics above that are required when creating a Box and Whisker Plot.

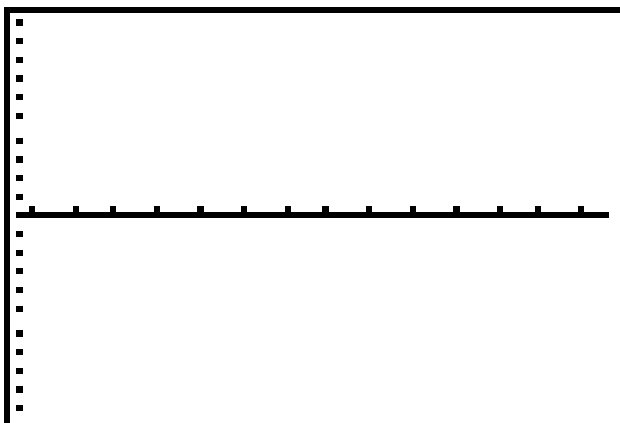
Step 4: Create Box and Whisker Plot using the TI graphing calculator

- 1) Go to Stat Plot ( 2<sup>nd</sup> Y=) to create a Box and Whisker Plot.
- 2) Select 1
- 3) Turn ON the plot
- 4) Select Type: Box and Whisker, no Outliers
- 5) Xlist: L1
- 6) Hit ZOOM 9 to see the plot



Step 5: Sketch Box and Whisker Plot

- 1) Sketch your Box and Whisker Plot recording important data values.
- 2) Use TRACE and your Left and Right Arrow keys to get important data values.



Step 6: Have teacher verify calculator work

Lesson Rubric

	3	2	1	0
Data Collection	At least 10 data points and both partners read	8 to 10 data points and both partners read	< 8 data points or only 1 partner read	< 8 data points and only 1 partner read
Data Output	All Statistics Recorded and Box & Whisker items marked	All Statistics Recorded and some Box & Whisker items marked	All Statistics recorded. No Box & Whisker items marked	Statistics incomplete. No Box & Whisker items marked
Box and Whisker Plot sketch	5 elements present, and data values marked	5 elements present, some data values	Incomplete sketch, some data values	Incomplete sketch, no data values
Teacher verification	Teacher Verified Calculator Entries and plot			Teacher did not verify calculator entries and plot

Total Score \_\_\_\_\_