

Making “Cents” of the Center



Objective:

Students will use pennies to:

- a) find the measures of central tendency
- b) make a box and whisker plot and a histogram

Time Needed: 1 to 2 class periods

All text in italics is when the TI –Navigator can be used.

Procedure:

- 1) Hand out various amounts of pennies to students. Write the years of the pennies on the sheet of paper pennies provided.
- 2) Have the students sort the paper pennies by year minted and line them up from earliest year to most recent.
- 3) Have the students calculate the mean, median and mode of the pennies. *Do quick polls to see what the mean, median and mode of the class is.*
- 4) Have the students enter their data into L1 in the graphing calculators. Press **[STAT]** **[▶]** Calc: 1-Var Stats: **[ENTER]** to check to see if their mean was correct.
- 5) Use the pennies to help the students find the median, Quartile 1 and Quartile 3. This should help the students see that the data is grouped in equal subsets.
- 6) The students should calculate the range of the data. Make a number line using equal intervals to cover the range. Plot the following above the number line:
 - Minimum value
 - Quartile 1
 - Median
 - Quartile 3
 - Maximum value
- 7) Demonstrate to the students how to make the “box and whiskers” of the plot. Allow them time to complete their own box and whisker plots. Explain to the students that they can use this same strategy when given any set of data.
- 8) Turn on the stat plot and choose the box and whisker plot without an outlier option in the stat plot. *Take a screen shot in navigator and discuss all of the plots.*
- 9) *Collect the data from all the students. You can either have them send it to teacher or you can force it from them. You can then make a box and whisker plot from the whole class’ data. Using either Smartview or Viewscreen share the box plot and discuss what you can tell about the graph.*

You can use the quick poll feature to ask the students questions regarding the box plot. You could also do a learn check to see if they really understand how to read a box plot. I would save each class data in a different list to use later if you are going to do the 2nd part of this activity.

Day 2 – Making histograms

- 1) Using the data from that class yesterday, make a histogram on the graphing calculator using a scale of 1 for the class to observe. Discuss how many “bars” there are if we intervals of 1. Ask the students what could be done to make this graph easier to read.
- 2) Send the students the class’ list of penny years from your calculator. Have them turn on the Stat plot and change the graph to a histogram. Give them time to adjust their window to show their data. Have them experiment on changing the interval. *Use a screen shot to show all of the graphs.* Discuss which graph would be the most appropriate.
- 3) Using their paper pennies, have the students make a histogram on paper using the knowledge that they just acquired.
- 4) Ask the students to enter their years again in L1. Have them graph their data. Ask them if they might need to change their window to better represent their data. *Screen shot the students finished products and discuss each graph.*
- 5) *Use quick polls to check student understanding using the students histograms.*
- 6) Using your calculator, put both the box plot and histogram on the same screen (Use plot1 and plot 2). Discuss what information we can get from a histogram (mode, median, mean, # of pieces of data) compared to a box and whisker plot (median, range).
- 7) *Use quick polls to check student understanding using the students histograms.*

