

Activity 2

Graphs

TEACHER NOTES

Topic Area: Data Analysis and Probability

NCTM Standard: Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Objective: The student will be able to utilize the Casio fx-9860G Plus calculator to use data to construct a variety of statistical graphs for use in the various activities included in this unit.

Introduction: This activity is designed to demonstrate the procedure to enter data into the Casio fx-9860G Plus graphing calculator in order to display various statistical graphs that students are required to understand on state exams.

The students should be familiar with the following vocabulary.

Bar Graph

Broken Line Graph

Frequency Polygon

Histogram

Scatter Plot

Calculator Notes for Activity 2

Objective: The student will be able to utilize the Casio fx-9860G Plus calculator to use data to construct a variety of statistical graphs for use in the various activities included in this unit.

Steps to Construct Graphs

Problem: The following are scores that 75 students received on a 100 point exam. Construct a histogram on the calculator. Next construct a scatter plot of the data using a frequency distribution table with class intervals of 10. Finally construct a frequency polygon using the frequency distribution table.

98, 85, 76, 83, 74, 85, 62, 79, 85, 89, 98, 87, 92, 84, 63, 28, 49, 88, 87, 92, 83, 79, 75, 68, 75, 96, 90, 83, 85, 68, 82, 85, 95, 100, 83, 79, 63, 85, 68, 86, 86, 85, 94, 89, 69, 98, 89, 89, 67, 84, 75, 76, 79, 87, 89, 95, 93, 86, 87, 88, 96, 57, 78, 64, 89, 75, 79, 82, 94, 96, 85, 95, 87, 88, 75.

1. The first step is to enter this data into the calculator. To do this, turn the calculator on and go to the Stat menu (use the following key strokes).

Op\$I

Your screen should like the following screen:

	List 1	List 2	List 3	List 4
SUB				
1				
2				
3				
4				

GRAPH CALC TEST INTR DIST | >

If your screen has numbers in the lists, you will need to delete them. To do this press the following keys to get the previous screen.

urq

Next, you can label the list column as SCORES. To do this, press the following keys:

BLamG96jml

Your screen should look like this:

	List 1	List 2	List 3	List 4
SUB	SCORES			
1	0			
2				
3				
4				
				0
	TOOL	EDIT	DEL DELA	INS
				D

To enter the data into list 1, enter each of the numbers and press execute after each one. Your key strokes are as follows:

98|85|76|83|74|85|62|79|85|89|98|87|9
2|84|63|28|49|88|87|92|83|79|75|68|75|
96|90|83|85|68|82|85|95|100|83|79|63|
85|68|86|86|85|94|89|69|98|89|89|67|8
4|75|76|79|87|89|95|93|86|87|88|96|57|
78|64|89|75|79|82|94|96|85|95|87|88|7
5|

Your final screen should like the following. Notice that the last number entered is the 75th number in the list.

	List 1	List 2	List 3	List 4
SUB	SCORES			
73	87			
74	88			
75	75			
76				

TOOL EDIT DEL DELA INS D

- Now you are ready to construct the graph. At the bottom of the screen, go to the GRAPH, and then Set to choose the graph type using the following key strokes.

qu

Your screen should look like this:

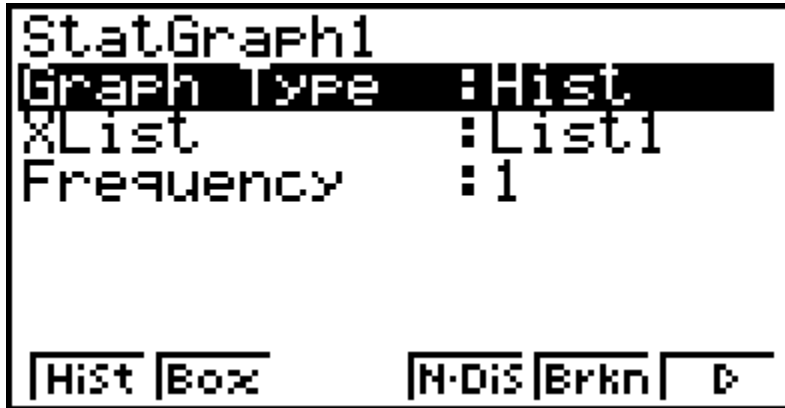
StatGraph1	
Graph Type	:Hist
XList	:List1
Frequency	:1

GRAPH1 GRAPH2 GRAPH3

Move your cursor to Graph Type. Notice that you have a number of choices; Histogram, Box, Normal Distribution, Broken-Line, Scatter Plot, etc. Choose Histogram. Use the following key strokes:

Nuq

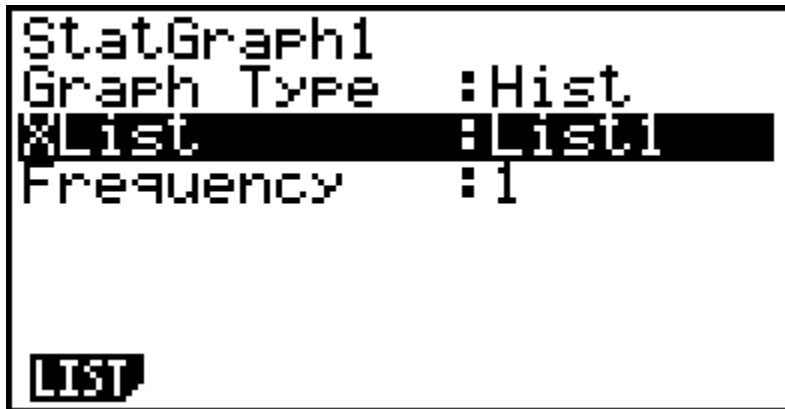
Your screen should look like this:



Move your cursor to XList and choose List1 since your data is stored in List 1. Use the following keys.

Nq1l

Your screen should look like this:



Move your cursor to Frequency and choose 1. Use these keys:

Nq

Your screen should look like this:

```
StatGraph1
Graph Type  :Hist
XList       :List1
Frequency   :1
┌──┬──┐
1  LIST
```

Exit this screen and choose SEL to turn the graph on for GPH1, the other graphs should be left off. Use these keys:

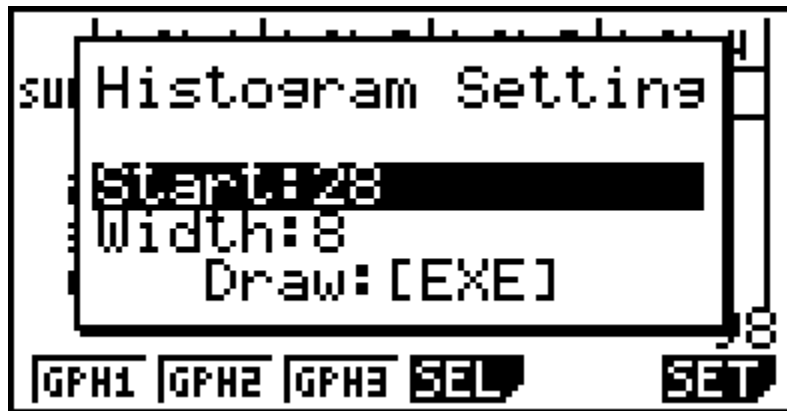
drqNwNw

Your screen should look like this:

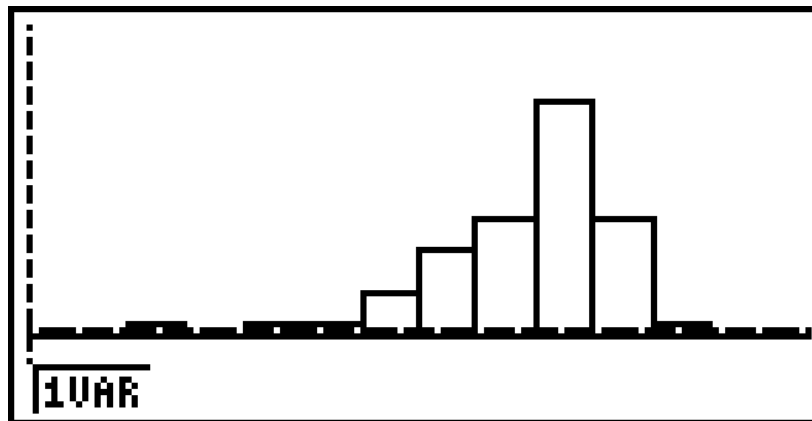
```
StatGraph1 :DrawOn
StatGraph2 :DrawOff
StatGraph3 :DrawOff
┌──┬──┐
on  off
┌──┬──┐
DRAW
```

Exit this screen, go to GPH1 and Execute. The calculator will display the standard settings before it graphs. Use the following keys to display the following screens.

dq



|



3. Next, construct a scatter plot of a frequency distribution of the data using a class interval of 10. Since the data is already in the calculator, we will proceed from that step. Let the calculator do the work by putting the numbers in order from smallest to largest, or an array. Press the following keys:

qq1l1l

Your screen should look like this:

	List 1	List 2	List 3	List 4
SUB	SCORES			
73	98			
74	98			
75	100			
76				

SRTA SRTD TOP BTM

Interval	Frequency
0-10	0
10-20	0
20-30	1
30-40	0
40-50	1
50-60	1
60-70	9
70-80	14
80-90	33
90-100	16

- Next, to make the frequency distribution table on the calculator, start by clearing the screen on the calculator using the following key strokes:

drq

Your screen should look like this:

	List 1	List 2	List 3	List 4
SUB				
1				
2				
3				
4				
TOOL EDIT DEL DELA INS D				

When putting a frequency distribution table into the calculator, list 1 should be the class marks and list 2 should be the frequency. Start by labeling list 1 MARKS and list 2 FREQ. Use the following key strokes:

BLA7f6,mllLa\$Bk6j5l!

Your screen should look like this:

	List 1	List 2	List 3	List 4
SUB	MARKS	FREQ		
1	0	0		
2				
3				
4				

TOOL EDIT DEL DELA INS D

Now, you are ready to enter the class marks into list 1 and frequencies into list 2. Use the following key strokes.

5|15|25|35|45|55|65|75|85|95|**\$**B0|0|1|0|1|1|9|14
|33|16|

Your screen should look like this:

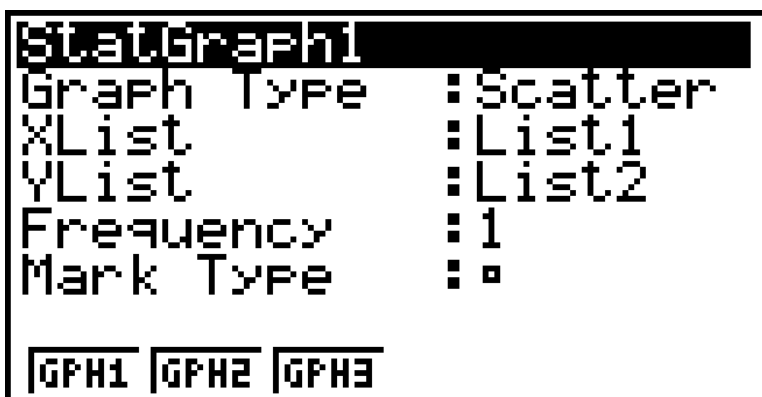
	List 1	List 2	List 3	List 4
SUB	MARKS	FREQ		
8	75	14		
9	85	33		
10	95	16		
11				

TOOL EDIT DEL DELA INS D

Exit the last screen, go to SET and change the Graph Type to Scatterplot, the Xlist to 1, the Ylist to 2, Frequency leave at 1, and Mark leave as the darkened box. Use the following key strokes.

uquNqNNNN

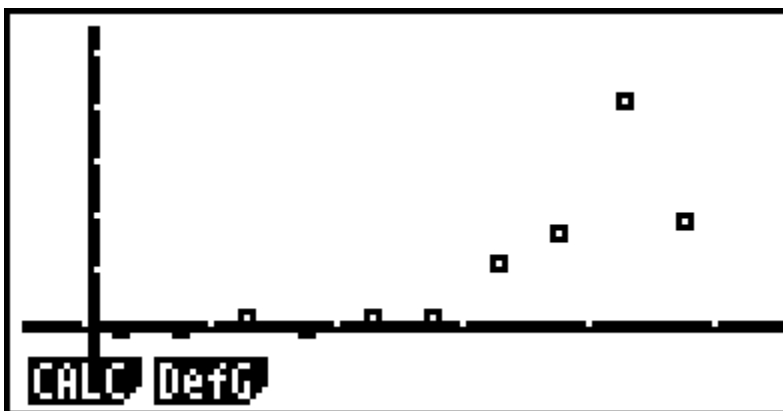
Your screen should look like this:



Exit this screen, go to Set, turn only the 1st graph on and execute to draw the graph. Use the following key strokes:

drqu

Your graph should look like this:

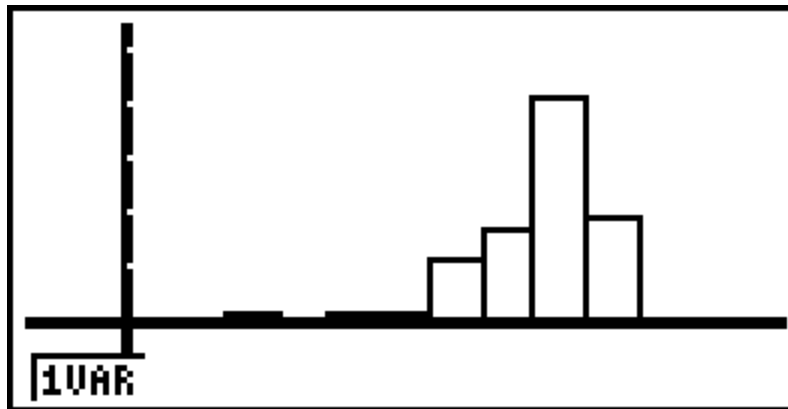


5. Finally, to construct the frequency polygon, we will use the frequency distribution table that is already in the calculator. A frequency polygon is made up of

two graphs; a histogram with a broken line graph on the top of each bar. Therefore, we will make graph 1 a histogram and graph 2 a broken-line graph and turn on both graphs 1 and 2 at the same time. Use the following key strokes to get the histogram. Make sure you set the Frequency to list 2 and the start at 0.

duNuqNNw2ldrqu0ll

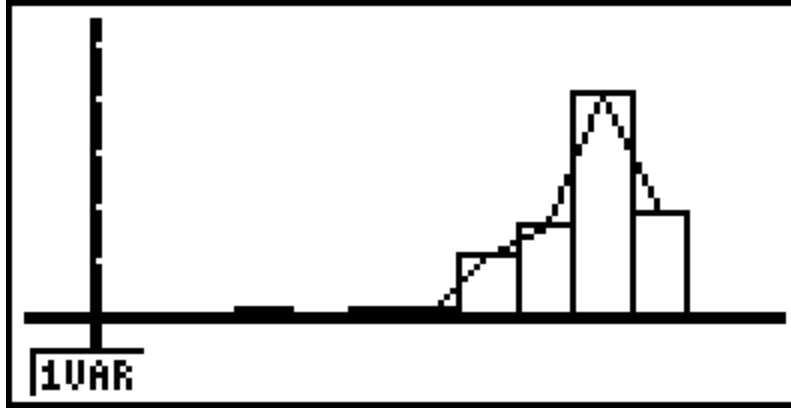
Your graph should look like this:



Now, put the broken line into graph 2 and turn the second graph on. Use the following keystrokes:

duwNNNdrNqul

Your graph should look like this:



Name _____ Class _____ Date _____

Activity 2: Worksheet

Graphs

For each list of data, construct a histogram, scatter plot and frequency polygon on the fx-9860G Plus graphing calculator. Use the given class interval for each problem. You may use your frequency distribution tables from Activity 1 Worksheet.

1. 32, 45, 46, 33, 25, 58, 55, 52, 31, 29, 36, 45, 51, 56, 51, 43, 32, 29, 31, 40, 42, 30, 35, 35, 39, 47, 26, 51, 57, 55, 42, 46, 53, 42, 41, 33, 35, 38, 50, 51, 52, 37, 38, 43, 47, 44, 52, 52, 38, 32, 53, 39, 31, 49, 48, 48, 45, 43, 46, 39, 52, 49, 38.

Class Interval = 5.

2. 20, 62, 55, 58, 53, 43, 39, 23, 16, 21, 28, 53, 61, 62, 60, 50, 45, 55, 53, 58, 57, 58, 58, 51, 37, 36, 29, 45, 33, 32, 26, 25, 17, 26, 29, 39, 33, 37, 48, 42, 26, 47, 42, 49, 39, 40, 42, 38, 37, 30, 21, 20, 19, 29, 52, 47, 36, 31, 52, 28, 37, 41, 49.

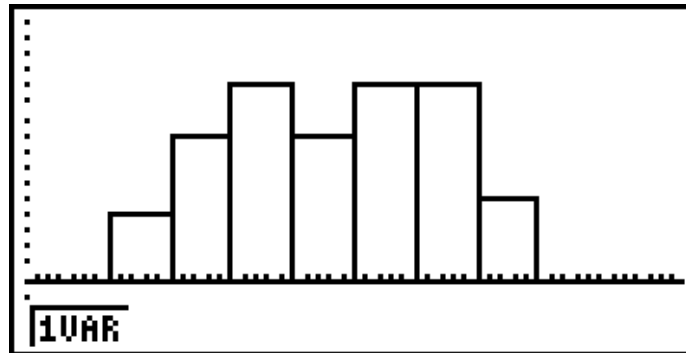
Class Interval = 8.

3. 19, 26, 23, 22, 34, 43, 41, 43, 43, 42, 39, 26, 27, 31, 42, 40, 39, 37, 33, 30, 22, 19, 20, 30, 34, 34, 38, 27, 22, 29, 39, 41, 42, 45, 46, 44, 42, 47, 21, 29, 22, 28, 30, 31, 43, 41, 39, 33, 34, 34, 38, 27, 22, 26, 23, 34, 32, 31, 41, 42, 33. **Class Interval = 3.**

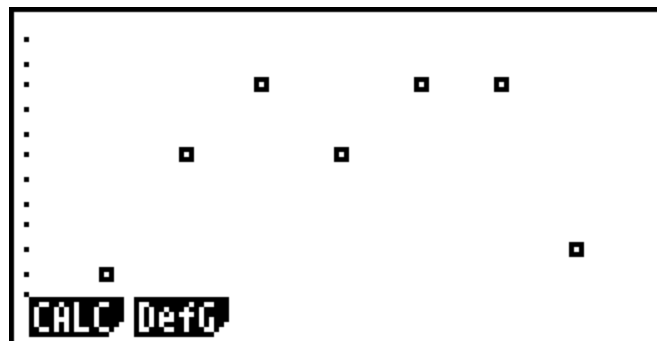
4. 12, 88, 81, 83, 34, 23, 18, 19, 34, 22, 20, 19, 55, 67, 66, 36, 84, 76, 72, 64, 81, 84, 76, 78, 68, 46, 55, 50, 24, 42, 76, 56, 43, 49, 50, 58, 56, 75, 24, 15, 41, 30, 53, 76, 81, 86, 49, 42, 55, 59, 62, 63, 74, 68, 60, 71, 37, 38, 39, 37, 49, 25, 72, 66, 77, 45, 59, 57, 62, 73, 57, 47, 24, 29, 38, 49, 82, 13, 16, 63, 56, 52, 59, 64, 78, 24. **Class Interval = 10.**

Solutions to Activity 2 Worksheet

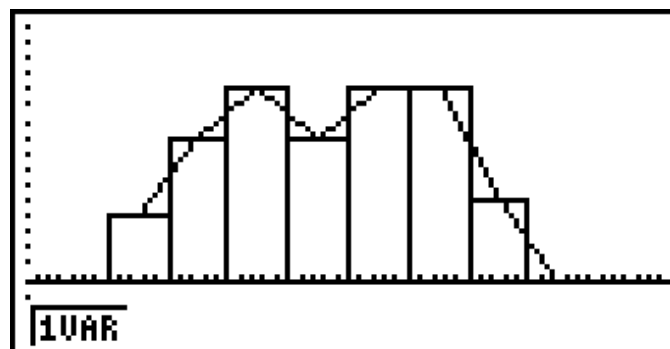
5. Histogram:



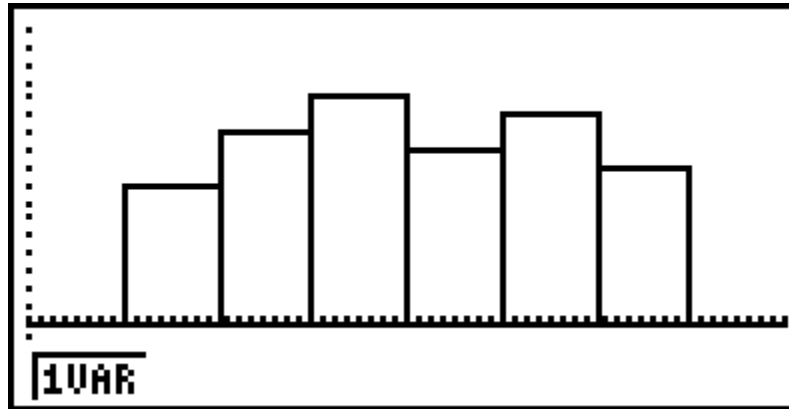
Scatter Plot:



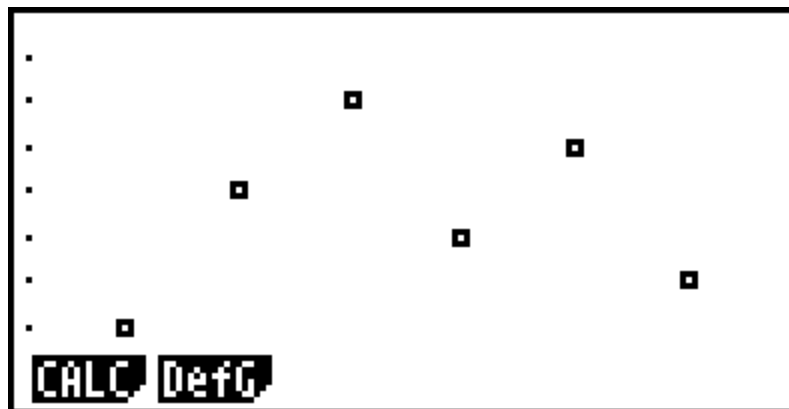
Frequency Polygon:



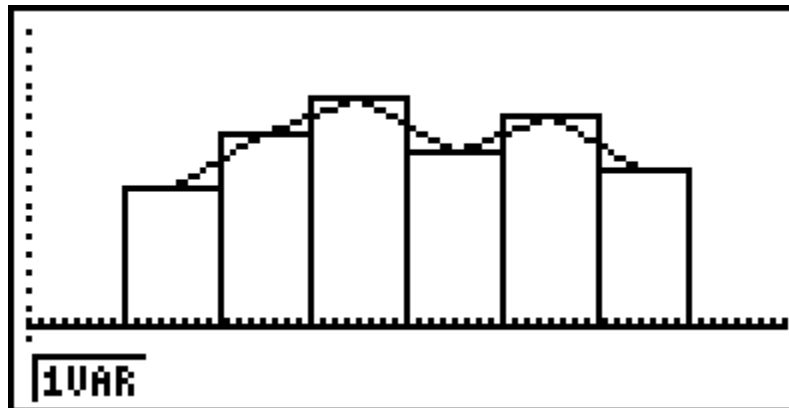
6. Histogram:



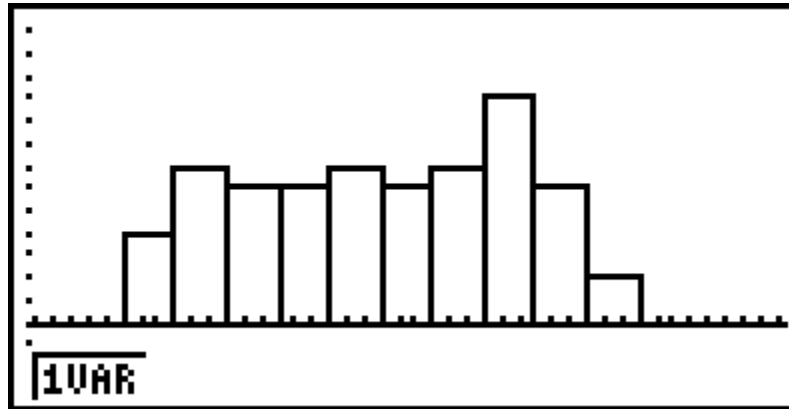
Scatter Plot:



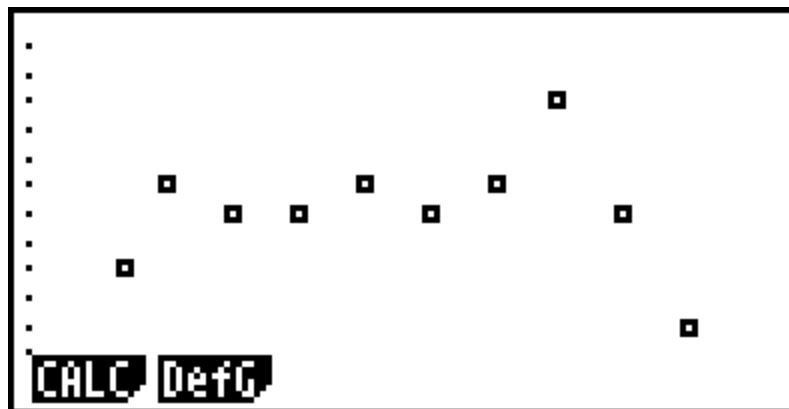
Frequency Polygon:



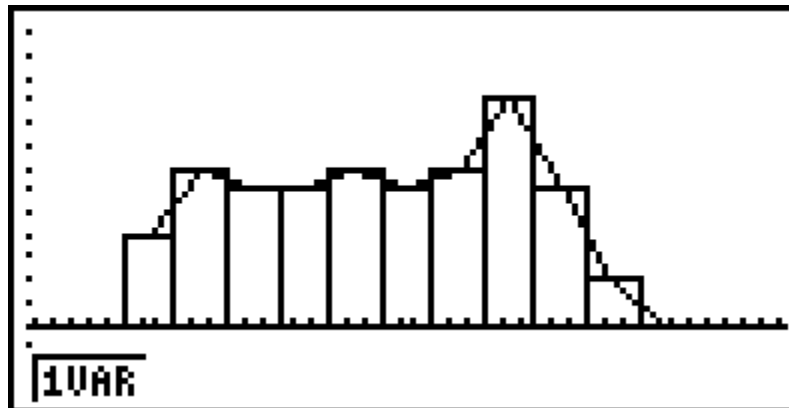
7. Histogram:



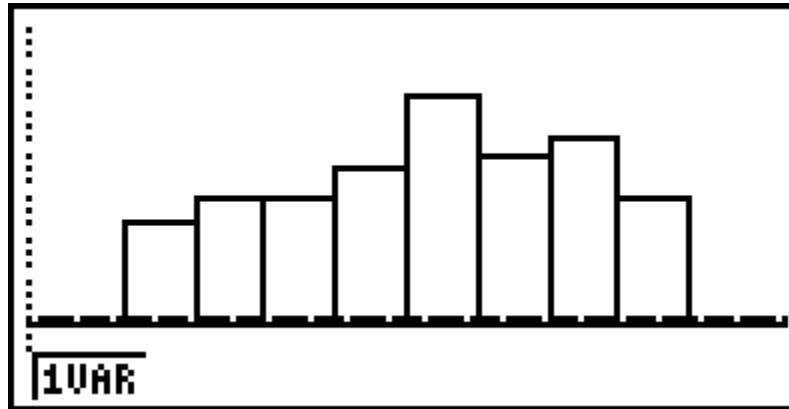
Scatter Plot:



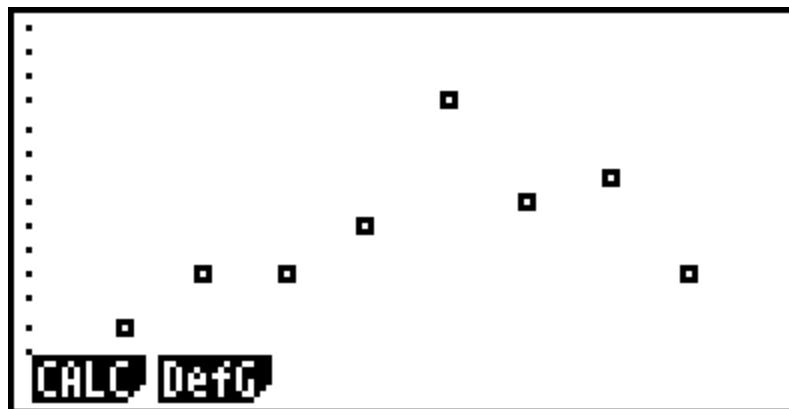
Frequency Polygon:



8. Histogram:



Scatter Plot:



Frequency Polygon:

