

Spreadsheets and Graphing

In this tutorial we will learn how to create some common statistical graphs from data in a spreadsheet. The spreadsheets we will use are DICE and WAPOP, both contained in the file SS07V1 in this edition of fxNews.

Copy the spreadsheets file called SS07V1 from the FXN07V1 folder in Storage memory to Main memory.

Copying files from Storage to Main memory

- From the Main Menu, choose Memory.
- Tap F2 (SMEM – Storage memory).
- Scroll to the [FXN07V1] folder and tap EXE.
- Scroll to SS07V1.g1m and tap F1 (SEL) and then F2 (COPY).
- Return to the Main Menu and choose S-SHT to access the spreadsheets. Tap F1 (FILE) followed by F2 (OPEN) to select from the list of spreadsheets now in Main Memory.

If you don't have the FXN07V1 folder in your calculator, then you need to load it into your calculator. See the tutorial called *How to load fxNews from CD into your fx-9860G* on fxNews CD5.

All the key sequences and images in this tutorial assume that in the SETUP, the Stat Wind is set to Auto as shown. Access the SETUP using SHIFT, MENU.

```
Auto Calc :On
Show Cell :Formula
Move      :Lower
Stat Wind :Auto
Resid List:None
Frac Result:d/c
Func Type :Y=
Auto Man  ↓
```

If you are familiar with graphing from STAT mode, then the main difference you will find when in a spreadsheet is rather than selecting Lists to graph, a range of cells must be selected.

Create a Histogram

DICE	A	B	C	D
1	Red	Blue	Total	
2	6	5	11	
3	5	4	9	
4	2	4	6	
5	1	1	2	"Red"

FILE EDIT DEL INS CLR D

Open the spreadsheet file called DICE that contains the simulated throws of 120 blue and 120 red dice, together with their total.

Out intention is to create a histogram of the 120 totals.

From the screen above (where the FILE, EDIT, etc menus are displayed) tap F6 then F1 (GRPH) to see the screen at right.

DICE	A	B	C	D
1	Red	Blue	Total	
2	6	5	11	
3	5	4	9	
4	2	4	6	
5	1	1	2	"Red"

GPHE GPHE GPHE SEL "Red" SET

Next tap F6 (SET) then tap the down cursor to select Graph Type. Tap F6 F1 to select Hist.

Tap the down cursor again and modify the XcellRange to C2:C121 (the range of cells containing our 120 totals).

```
StatGraph1
Graph Type:Hist
XcellRange:C2:C121
Frequency:1
CELL
```

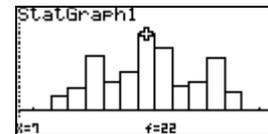
Now tap EXIT followed by F1 (GPH1).

You are prompted for Histogram Setting. Our lowest expected score is 2, so use that value for Start. Use a Width of 1 as our scores are the integer values 2, 3, 4, ..., 12.



Tap EXE to create the histogram.

Tap SHIFT F1 and use the cursor to trace through the columns and see the individual frequencies for each score.



To throw the dice again and redraw the histogram...

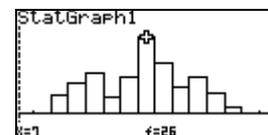
Tap EXIT, EXIT, F6 to see the FILE menu.

Tap F1 (FILE) F4 (RECAL) and the spreadsheet 're-throws' itself!

DICE	A	B	C	D
1 Red	Blue	Total		
2	5	3	8	
3	5	4	9	
4	2	2	4	
5	5	5	10	"Red"

NEW OPN SUVS RECAL

Tap EXIT F6 F1 F1, set the Histogram Settings as before and tap EXE to create the new histogram.



Create a Single Boxplot

WAP	A	B	C	D
1	AREA		POPULA	BIRTHS
2	Cambridge		24382	291
3	Claremont		9206	74
4	Cottesloe		7387	78
5	Mosman Park		8364	92

FILE EDIT DEL INS CLR

Open the spreadsheet file called WAPOP that contains data for the Statistical Division of Perth from the 2001 Australian Census.

Our intention is to create a boxplot of the populations of the 37 Local Areas that comprise the Statistical Division of Perth contained in Column C.

From the screen above (where the FILE, EDIT, etc menus are displayed) tap F6 then F1 (GRPH) to see the screen at right.

WAP	A	B	C	D
1	AREA		POPULA	BIRTHS
2	Cambridge		24382	291
3	Claremont		9206	74
4	Cottesloe		7387	78
5	Mosman Park		8364	92

GP1 GP2 GP3 SEL AREA SET

Next tap F6 (SET) then tap the down cursor to select Graph Type. Tap F6 F2 to select MedBox.

Tap the down cursor again and modify the XcellRange to C2:C38 (the range of cells containing our 37 populations).

StatGraph1
Graph Type:MedBox
XcellRange:C2:C38
Frequency:1
Outliers:Off
CELL

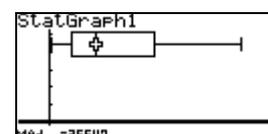
Now tap EXIT followed by SHIFT F3 to modify the y-scale for our View Window so that Ymin = -1 and Ymax = 6.

This is an optional step, but does have the effect of positioning the x-axis out of the way of the boxplot.

View Window
Xmin:-6.3
max:6.3
scale:1
dot:0.1
Ymin:-1
max:6
INIT TRIG STD STO RCL

Tap EXIT to leave the View Window followed by F1 (GPH1).

Tap SHIFT F1 and use the cursor keys to trace through the five key points of the boxplot.



Create Two Boxplots

WAP	D	E	F	G
1	BIRTHS	DEATHS		
2	291	189		
3	74	92		
4	78	56		
5	92	74		

Our intention now is to create a pair of boxplots to compare the spread of births and deaths during 2001 for the 38 Local Areas contained in Columns D and E.

Navigate to the screen at right, as for the single boxplot above.

WAP	A	B	C	D
1	AREA	POPULA	BIRTHS	
2	Cambridge	24382	291	
3	Clermont	9206	74	
4	Cottesloe	7387	78	
5	Mosman Park	8364	92	

Next tap F6 (SET) then tap the down cursor to select Graph Type. Tap F6 F2 to select MedBox. Tap the down cursor again and modify the XcellRange to D2:D38 (the range of cells containing our 37 populations).

```
StatGraph1
Graph Type:MedBox
XcellRange:D2:D38
Frequency:1
Outliers:Off
ICELL
```

Move the cursor back to the top row. Now tap F2 to select StatGraph2 and repeat the settings as above except the XcellRange is now E2:E38.

```
StatGraph2
Graph Type:MedBox
XcellRange:E2:E38
Frequency:1
Outliers:Off
ICELL
```

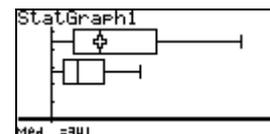
Now tap EXIT followed by SHIFT F3 to modify the y-scale if you did not already do so when drawing a single boxplot.

```
View Window
Xmin :-6.3
max :6.3
scale:1
dot :0.1
Ymin :-1
max :6
INIT TRIG STO STO RCL
```

Tap EXIT to leave the View Window followed by F4 (SEL).

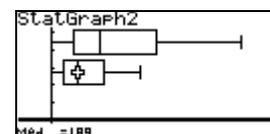
```
StatGraph1 :DrawOn
StatGraph2 :DrawOn
StatGraph3 :DrawOff
On Off DRAW
```

Tap F6 (DRAW) to create the boxplots.



Tap SHIFT F1 and use the cursor keys to trace through the five key points of the first boxplot.

Tap the down cursor to trace through the five key points of the second boxplot.



Scatterplot

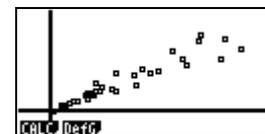
WAP	B	C	D	E
1		POPULA	BIRTHS	DEATHS
2		24382	291	189
3		9206	74	92
4		1387	78	56
5		8364	92	74

To round off this tutorial we will create a scatterplot of the population (x) against the number of births (y) for the 37 Local Areas.

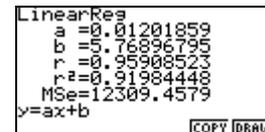
Find your way to the graph SET screen again, set the Graph Type to Scatter, the XcellRange from C2:C38 and the YcellRange from D2:D38.



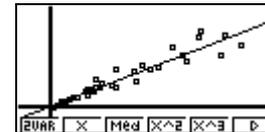
Then tap EXIT followed by F1 to create the scatterplot.



To add a trend line based on linear-regression tap F1 (CALC) and then F2 (X). [X fits a linear model to the data. Many other choices are also available]



Tap F6 to DRAW the line on the scatterplot.



The y-intercept of the line is close to zero, considering the numbers involved. This then suggests that the population and births are in direct proportion and so the gradient of 0.012 can be interpreted as a growth rate of 1.2%.

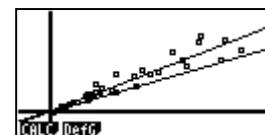
Between what values is the growth rate for most Local Areas? Let's add our own line of $Y=0.009X$, guessing the lower rate is 0.9%.



Tap EXIT, F2 (DefG) and enter 0.009X for Y1.

Next tap F6 (DRAW) to add this line.

Pretty good! It looks like all points are above this line.



Now estimate the upper rate and add a line to show it.