

Lesson 14

A Sick Astronaut

Approximate time needed for lesson:
One 50-minute or one 90-minute
class period

NCTM Standards

- ▶ **Algebra:** Represent and analyze mathematical situations and structures using algebraic symbols
- ▶ **Data Analysis and Probability:** Select and use appropriate statistical methods to analyze data
- ▶ **Representation:** Use representations to model and interpret physical, social, and mathematical phenomena

Goals for Students

- ▶ Graph, interpret, and analyze data
- ▶ Investigate the relationship between two variables in a problem situation
- ▶ Apply measures of central tendency in a problem situation
- ▶ Use both graphic and symbolic representations to represent the relationship between two variables
- ▶ Use the concept of line of best fit to describe the relationship between two variables

Description or Summary of Lesson

Middle grade students in Pre-algebra or Algebra I are the intended audience. Temperature data given in both Celsius and Fahrenheit will be investigated with the graphing calculator in order to “discover” the formula that relates the two temperature scales. Students will work in groups or individually to analyze and represent the data. The lesson investigates measures of central tendency by applying them in a motivational, problem-solving situation.

Background Information

Prior to this lesson, students should have studied coordinate graphing, the slope, y-intercept form for the equation of a line, the concept of line of best fit, and measures of central tendency.

Materials and Equipment

- ▶ Overhead projector and overhead graphing calculator
- ▶ Each student will need
 - access to a graphing calculator
 - handouts

Lesson 14: Outline

- I. Teacher reviews coordinate graphing, the slope, y-intercept form for the equation of a line, the concept of line of best fit, and measures of central tendency.
- II. Students, individually or in small groups, complete Handout 1 using the graphing calculator and the Calculator Instructions in Handout 2.
- III. Teacher and students discuss Handout 1.

Teacher's Notes

Students will use the graphing calculator to derive the conversion formula of Celsius to Fahrenheit: $\text{Fahrenheit} = 9/5 \times \text{Celsius} + 32$, approximately; or $\text{Fahrenheit} = 1.8 \times \text{Celsius} + 32$, approximately.

In this lesson, the graphing calculator method reinforces the concepts of range, mean, and median, as well as line of best fit, etc.

DISCUSSION POINT

The teacher may want to discuss with students how to determine the most efficient method for solving a problem—the graphing calculator, paper-and-pencil, or mental calculation.

For example, with only seven data points, the median and range (and even the mean), may be easier to calculate by hand. However, for large lists, with many data points with several digits, the calculator may be more efficient.

Teacher's Notes: Activity 1

A Temperature Investigation

Handout 1: Data Analysis Sheet

In addition to the sample answers below, the following screens may also be helpful.

```

max(LNRC)-min(LN
RC)
                2.2
mean(LNRC)
38.22857143
median(LNRC)
                38.3
  
```

```

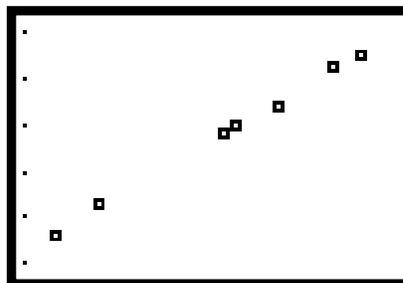
max(LNRF)-min(LN
RF)
                3.9
mean(LNRF)
100.8285714
median(LNRF)
                101
  
```

Sample Answers for Activity 1, Handout 1:

- ◆ With Nurse Careforu's temperature in degrees as the independent variable (x) and Nurse Feelgood's temperature in degrees as the dependent variable (y), graph the information as a scatter plot. Fill in the **Window** with the calculator set for **ZoomStat**.

Xmin	36.78
Xmax	39.42
Xscl	10
Ymin	97.937
Ymax	103.163
Yscl	1

- ◆ Sketch the graph from the calculator screen. Use your ruler to draw a line that goes through as many of the points as possible.



Sample Answers for Activity 1, Handout 1 (continued):

1. Use a graphing calculator to answer the following questions:
 - a. The equation of the line of best fit is (round to 1 decimal place) $y = 1.7x + 34.2$
 - b. The slope is 1.7. Write the slope as a fraction. 17/10
 - c. The y-intercept is 34.2; thus, the point where the line intersects the y-axis is (0, 34.2).
 - d. Interpret this point for Iam. **If NRC recorded 0, NRF would have recorded 34.2. We might guess that Iam would be dead if his temperature was that much lower than any of the other readings.**
 - e. Interpret it for the rest of the real world. **If the temperature on one scale is 0, it would be approximately 34.2 on the other scale.**
 - f. Do you think there is a reason for the name of the nurses? If yes, explain. **In Nurse Careforu, the C must indicate Celsius; and in Nurse Feelgood, the F must indicate Fahrenheit.**
 If not, reconsider what the nurses did in this situation. **They each took Iam's temperature and we know there are two scales that would be appropriate for temperature: Fahrenheit and Celsius.**
 - g. What is the standard formula for the relationship between degrees Celsius and Fahrenheit? **Fahrenheit = 9/5 X Celsius + 32, approximately, or Fahrenheit = 1.8 X Celsius + 32, approximately.**
 Where did you find this information or how did you calculate it? **Answers will vary.**
 - h. How does the slope on the line of best fit and the y-intercept compare to the standard formula? **The slope is 1.7 vs. 1.8 in the formula and the y-intercept is 34.2 vs. 32 in the formula. They are pretty close.**
2.
 - a. What was the range of Iam's temperature according to Nurse Careforu? **2.2**
 - b. What was Iam's mean temperature for the week according to Nurse Careforu? **38.23**
 On which day(s) did this occur? **None**
 - c. What was Iam's median temperature for the week according to Nurse Careforu? **38.3**
 On which day(s) did this occur? **Sunday**
 - d. What was the mode of Iam's temperature according to Nurse Careforu? **There isn't one.**
 On which day(s) did this occur? **Not applicable**
3.
 - a. What was the range of Iam's temperature according to Nurse Feelgood?
 - b. What was Iam's mean temperature for the week according to Nurse Feelgood? **100.83**
 On which day(s) did this occur? **No day**
 - c. What was Iam's median temperature for the week according to Nurse Feelgood? **101**
 On which day(s) did this occur? **Sunday**
 - d. What was the mode of Iam's temperature according to Nurse Feelgood? **There is no mode**
 On which day(s) did this occur? **Not applicable**

4. Compare the results in #2 and #3. Explain what you just found.

Answers will vary. For example, the median temperature occurred on the same day in both cases. There is no mode in each case. The mean was not one of the temperatures recorded. The range, the median, and the mode were bigger in #3 than in #2. In both cases, the range was small in comparison to the mean.

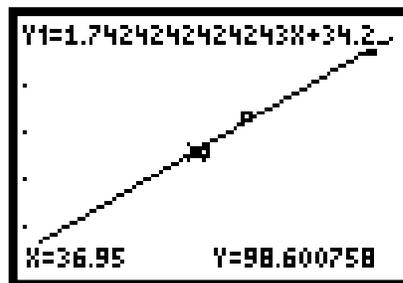
DISCUSSION POINTS

- Why was the mean not one of the recorded temperatures by either nurse, whereas the median was?

Answers will vary. For example, the mean is the average, which is not necessarily one of the temperatures, just as your grade average may not be the same as any one of your grades. The median is the middle number when arranged in ascending or descending order. In this case, since there are seven (an odd number of scores), the median is actually one of the temperatures. If there were an even number of temperature recordings, the median would be the average of two of the temperatures and might or might not be one of the actual temperatures.

- How could you use your calculator to see what a normal temperature is in Celsius?

Answers will vary. Since we know 98.6 is normal on the Fahrenheit scale, use the **TRACE key and the up or down arrow key to get on the line of best fit. Then enter numbers close to 37 for X until the Y value is as close to 98.6 as possible.**



- Which day of the week was Iam's temperature normal?

Saturday

Teacher's Notes

Activity 1. A Temperature Investigation

Handout 2: Calculator Instructions

Note: If r and r^2 values appear when calculating the a and b for the linear regression line, the diagnostics are on. The r value is called the correlation coefficient. The closer the line comes to hitting all of the points, the closer this number approaches 1. This r indicates a good fit of the line and the data points. To have only the a and b showing on the screen, press **2nd** **PRGM** (CATALOG) on the TI-73 or press **2nd** **0** (CATALOG) on the TI-83 Plus. Then arrow down to **DiagnosticOff** and press **ENTER** to show **DiagnosticOff** on the Homescreen and **ENTER** to see **Done**.

Some of the calculations could be done with alternate instructions; the ones suggested in Handout 2 were chosen arbitrarily.

Suggestion for Assessment

ASSESSMENT POINT

Give students two sets of data and let them explore the relationship between the sets, as well as find measures of center (mean, median, and mode) and the range for each set. Access to a calculator would be preferred.

Adaptations / Extensions

- ◆ Have students take their temperature every day in the morning and evening for one week and record their results in a table. At the end of the week, have them graph their data and look for relationships. They can find their mean temperatures for each day, for the morning, for the evening, and for the entire week. They can find the median, mode, and range for all of these time periods as well. Have them bring their data back to the class and discover if the class has a higher temperature in the morning, evening, or on a particular day.
- ◆ Hang a thermometer in the classroom. Read and record the temperature every day at the same time. Find the measures of central tendency for the data. Graph the data. Is there any relationship between the temperature at one time in the day to another time?
- ◆ Suggestion: Assign students to research various temperature scales. Why is there more than one? Who invented each one? Why did they invent each scale? When? Have students write a brief report and have them include their sources.
- ◆ Complete a CBL or CBR activity such as those in *Real-World Math with the CBL System* by Chris Brueningsen, Bill Bower, Linda Antinone, and Elisa Brueningsen, copyright 1994, Texas Instruments.

Lesson 14: A Sick Astronaut

Activity 1. A Temperature Investigation

Handout 1: Data Analysis Sheet

Use a graphing calculator and the detailed instructions in Handout 2 to help you answer questions related to the following information:

- ◆ Astronaut Iam Sick was ill for one week during training. The table shows his temperature on each day, as measured by Nurse Careforu and Nurse Feelgood.

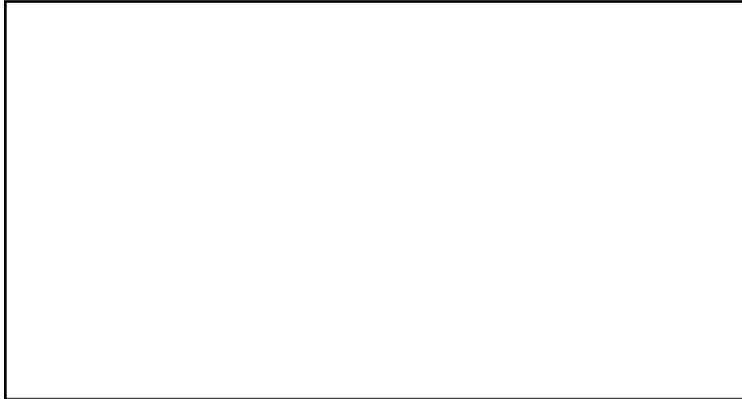
SUNDAY	38.3	101
MONDAY	39.2	102.5
TUESDAY	38.2	100.8
WEDNESDAY	38.6	101.4
THURSDAY	39	102.2
FRIDAY	37.3	99.3
SATURDAY	37	98.6

- ◆ With Nurse Careforu's temperature in degrees as the independent variable (x) and Nurse Feelgood's temperature in degrees as the dependent variable (y), graph the information as a scatter plot. Fill in the Window with the calculator set for ZoomStat.

Xmin	
Xmax	
Xscl	
Ymin	
Ymax	
Yscl	

Activity 1, Handout 1 (continued):

- ◆ Sketch the graph from the calculator screen. Use your ruler to draw a line that goes through as many of the points as possible.



1. Use a graphing calculator to answer the following questions:
 - a. The equation of the line of best fit is (round to 1 decimal place). _____
 - b. The slope is _____. Write the slope as a fraction. _____
 - c. The y-intercept is _____; thus, the point where the line intersects the y-axis is _____.
 - d. Interpret this point for Iam. _____

 - e. Interpret it for the rest of the real world. _____

 - f. Do you think there is a reason for the name of the nurses? If yes, explain.

If not, reconsider what the nurses did in this situation. _____

Activity 1, Handout 1 (continued):

- g. What is the standard formula for the relationship between degrees Celsius and Fahrenheit?

Where did you find this information or how did you calculate it? _____

- h. How does the slope on the line of best fit and the y-intercept compare to the standard formula?

2. a. What was the range of Iam's temperature according to Nurse Careforu? _____

- b. What was Iam's mean temperature for the week according to Nurse Careforu? _____

On which day(s) did this occur? _____

- c. What was Iam's median temperature for the week according to Nurse Careforu? _____

On which day(s) did this occur? _____

- d. What was the mode of Iam's temperature according to Nurse Careforu? _____

On which days did this occur? _____

3. a. What was the range of Iam's temperature according to Nurse Feelgood? _____

- b. What was Iam's mean temperature for the week according to Nurse Feelgood? _____

On which day(s) did this occur? _____

- c. What was Iam's median temperature for the week according to Nurse Feelgood? _____

On which day(s) did this occur? _____

- d. What was the mode of Iam's temperature according to Nurse Feelgood? _____

On which days did this occur? _____

4. Compare the results in #2 and #3. Explain what you just found.

Activity 1. A Temperature Investigation

Handout 2: TI-83 Plus Calculator Instructions

- ◆ Enter each list of temperatures in a list labeled with the nurse's name, NRC or NRF, by pressing **STAT** **1** (Edit).
- ◆ Press **2nd** **DEL** (INS) to name a list. You will notice that your cursor has become a flashing **A**, which indicates that the **A-Lock** is on and you are ready to enter letters. With the cursor on the top of a column, use the keyboard to name each new list. Then arrow down to enter values.

NRC	NRF	L1	3
98.3	102.5	-----	
98.2	102.5		
98.2	100.8		
98.6	101.4		
99	102.2		
97.3	99.3		
97	98.6		
NRF(1) = 101			

- ◆ Use **2nd** **Y=** (STATPLOT) for the **STATPLOT** menu.
- ◆ Press **4** to place **PlotsOff** on the Homescreen.
- ◆ Press **ENTER**. This will turn all the Plots off.
- ◆ Press **Y=**. If any of the = signs are highlighted, move the cursor on top of the = and press **ENTER**. Doing this will make the graph of that equation invisible. Or if you do not want that equation anymore, keep the cursor on top of the equation and press **CLEAR**. Do one of these two things for any equation that is in **Y=**.
- ◆ To turn on **STATPLOT 1** press **2nd** **Y=** (STATPLOT) again (the **On** is highlighted) and press **ENTER**.
- ◆ **▼** to select the scatter plot and press **ENTER**.
- ◆ Then **▼** and with **2nd** **ALPHA** (A-Lock) and the keyboard, enter NRC for the **Xlist** and NRF for the **Ylist**.
- ◆ Also select the first mark and press **ENTER**.

Plot1	Plot2	Plot3
Off	Off	
Type:		
Xlist:	NRC	
Ylist:	NRF	
Mark:		

TI-83 Plus Keystrokes (continued):

- ◆ Press **ZOOM** **9** (ZoomStat) to set an appropriate window and to view a graph of the data.
- ◆ Press **WINDOW** and record the values on Handout 1. Press **GRAPH**. Sketch the graph on Handout 1.
- ◆ To look at specific values, press **TRACE**. At the bottom of the screen, the X and Y values for that point will appear. Use the right arrow and left arrows to move to different points.
- ◆ Establish a line of best fit and write its equation by pressing **STAT** **▶** (CALC). Then press **4** to put **LinReg(ax+b)** on the Homescreen.

```

EDIT  [2nd] [F1] TESTS
1:1-Var Stats
2:2-Var Stats
3:Med-Med
4:LinReg(ax+b)
5:QuadReg
6:CubicReg
7↓QuartReg

```

```

LinReg(ax+b)

```

- ◆ To complete the instructions for **LinReg(ax+b)**, press **2nd** **STAT** (LIST).

```

NAME OPS MATH
1:L1
2:L2
3:L3
4:L4
5:L5
6:L6
7↓NRC

```

- ◆ Find NRC and press **ENTER** then **,**. Again press **2nd** **STAT** (LIST), find NRF, and press **ENTER**.

```

LinReg(ax+b) LNR
C, LNRF

```

TI-83 Plus Keystrokes (continued):

- ◆ Press **ENTER** and two or more values appear. The value for a is the slope and b is the y-intercept for the linear regression equation.
- ◆ If an r value appears, it is called the correlation coefficient. The closer the line comes to fitting or hitting all of the points, the closer the absolute value of this number is to 1. This r indicates a good fit of the line and the data points.
- ◆ Use the numbers for a and b to help answer the questions in #1 on Handout 1. Round any values to tenths place.
- ◆ Press **Y=** and clear Y_1 . (Be sure that only the = sign for Y_1 is highlighted. Also, be sure that all other plots are turned off, i.e., at the top of the screen only **Plot1** should be highlighted.)

```

Plot1 Plot2 Plot3
\Y1=
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=

```

- ◆ Press **Vars** **5** (Statistics). Then **▶** **▶** to **EQ**.
- ◆ Press **1** to paste the equation of the line of best fit into Y_1 .

```

VARS Y-VARS
1: Window...
2: Zoom...
3: GDB...
4: Picture...
5: Statistics...
6: Table...
7: String...

```

```

XY Σ REG TEST PTS
1: RegEQ
2: a
3: b
4: c
5: d
6: e
7: ↓r

```

- ◆ Record this equation on Handout 1, rounding the values for a and b to tenths place.
- ◆ Press **GRAPH** to see how well this line fits the data. Compare the results to the line you drew with the ruler in Handout 1.

TI-83 Plus Keystrokes (continued):

Use the graphing calculator to determine other statistical values as follows:

- ◆ To determine the range for the temperatures taken by Nurse Careforu, press **2nd** **STAT** (LIST) and arrow to **MATH**.
- ◆ Press **2** (max(), **2nd** **STAT** (LIST), highlight NRC, and press **ENTER**.
- ◆ Then press **)** and **-**.
- ◆ Next press **2nd** **STAT** (LIST) and arrow to MATH. Press **1** (min(), **2nd** **STAT** (LIST), highlight NRC, and press **)**.

```

max(LNRC)-min(LN
RC)

```

- ◆ Press **ENTER** to see the range. Record this on Handout 1.
- ◆ Similarly, determine mean and median **in turn** using **3:** and **4:** in the 2nd **STAT MATH** menu.
- ◆ In a similar way, find the range, mean, median, and mode **LNRF**.

Activity 1. A Temperature Investigation

Handout 2: TI-73 Calculator Instructions

- ◆ Enter each list of temperatures in a list labeled with the nurse's name, NRC or NRF, by pressing **LIST**.
- ◆ If the lists have data already entered in the columns, use the up arrow key to highlight L_1 . Press **CLEAR** **ENTER**. This should clear the data from that column. You may clear each of the columns this way. When any unwanted data have been cleared from the lists, move the cursor until L_1 is highlighted.
- ◆ Press **2nd** **DEL** (INS) to name a list.
- ◆ Press **2nd** **MATH** (TEXT) and use the arrow keys to "box" the **N** and press **ENTER**, move the cursor to "box" the **R** and press **ENTER**, move the cursor to "box" the **C**, and finally move the cursor to "box" the **Done** and press **ENTER**. Press **ENTER** one more time and a list will now be named NRC.
- ◆ In a similar way, name a list NRF. Then arrow down to enter values.

NRC	NRF	L1	1
38.3	101	-----	
39.2	102.5		
38.2	100.8		
38.6	101.4		
39	102.2		
37.3	99.3		
37	98.6		
NRC(1) = 38.3			

- ◆ Use **2nd** **Y=** (PLOT) for the **PLOT** menu.
- ◆ Press **4** to place **PlotsOff** on the Homescreen.
- ◆ Press **ENTER**. This will turn all the Plots off.
- ◆ Press **Y=**. If any of the = signs are highlighted, move the cursor on top of the = and press **ENTER**. Doing this will make the graph of that equation invisible. Or if you do not want that equation anymore, keep the cursor on top of the equation and press **CLEAR**. Do one of these two things for any equation that is in **Y=**.
- ◆ To turn on **PLOT1** press **2nd** **Y=** (PLOT) again (the **On** is highlighted) and press **ENTER**.
- ◆ **▼** to select the scatter plot and press **ENTER**.

TI-73 Keystrokes (continued):

- ◆ **▼** to **Xlist** and enter list NRC by pressing **2nd** **LIST** (STAT) and arrow down until NRC is highlighted and press **ENTER**.
- ◆ **▼** to **Ylist** and enter list NRF by pressing **2nd** **LIST** (STAT) and arrow down until NRF is highlighted and press **ENTER**.
- ◆ Also select the first mark and press **ENTER**.

```
Plot1 Off
Type:
Xlist:NRC
Ylist:NRF
Mark: +
```

- ◆ Press **ZOOM** **7** (ZOOMSTAT) to set an appropriate window and to view a graph of the data.
- ◆ Press **WINDOW** and record the values on Handout 1. Press **GRAPH**. Sketch the graph on Handout 1.
- ◆ To look at specific values, press **TRACE**. At the bottom of the screen, the X and Y values for that point will appear. Use the right arrow and left arrows to move to different points.
- ◆ Establish a line of best fit and write its equation by pressing **2nd** **LIST** (STAT). Right arrow to **CALC**. Then press **5** to place **LinReg(ax + b)** on the Homescreen.

```
Ls OPS MATH
1:1-Var Stats
2:2-Var Stats
3:Manual-Fit
4:Med-Med
5:LinReg(ax+b)
6:QuadReg
7:ExpReg
```

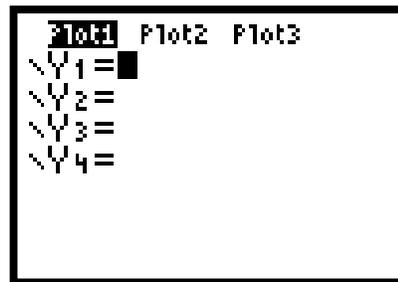
```
LinReg(ax+b)
```

- ◆ To complete the instructions for **LinReg(ax+b)**, press **2nd** **LIST** (STAT).

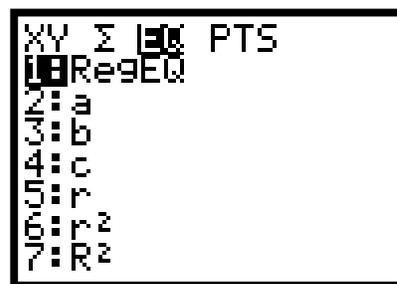
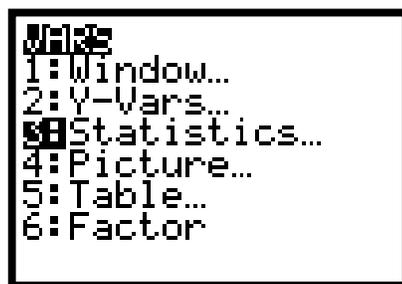
```
OPS MATH CALC
1:L1
2:L2
3:L3
4:L4
5:L5
6:L6
7:NRC
```

TI-73 Keystrokes (continued):

- ◆ Find NRC and press **ENTER** **,**. Press **2nd** **LIST** (STAT) and arrow down to NRF and press **ENTER**.
- ◆ Press **ENTER** and two or more values appear. **The value for a is the slope and b is the y-intercept for the linear regression equation.**
- ◆ If an r value appears, it is called the correlation coefficient. The closer the line comes to fitting or hitting all of the points, the closer the absolute value of this number is to 1. This r indicates a good fit of the line and the data points.
- ◆ Use the numbers for a and b to help answer the questions in #1 on Handout 1. Round any values to tenths place.
- ◆ Press **Y=** and clear Y_1 . (Be sure that only the = sign for Y_1 is highlighted. Also, be sure that all other plots are turned off, i.e., at the top of the screen only **Plot1** should be highlighted.)



- ◆ Press **2nd** **APPS** (VARS) and **3** (Statistics).
- ◆ Then press **▶** **▶** to **EQ**.
- ◆ Press **1** to paste the equation into Y_1 .



- ◆ Record this equation on Handout 1, rounding the values for a and b to tenths place.

TI-73 Keystrokes (continued):

- ◆ Press **GRAPH** to see how well this line fits the data. Compare the results to the line you drew with the ruler in Handout 1.
- ◆ Use the graphing calculator to determine other statistical values as follows:
- ◆ To determine the range for the temperatures taken by Nurse Careforu, press **2nd** **LIST** (STAT) and **▶** **▶** to **MATH**.
- ◆ Press **2** (max()), **2nd** **LIST** (STAT), highlight NRC, and press **ENTER**.
- ◆ Then press **)** and **-**.

```
max(LNRC)-min(LN
RC)■
```

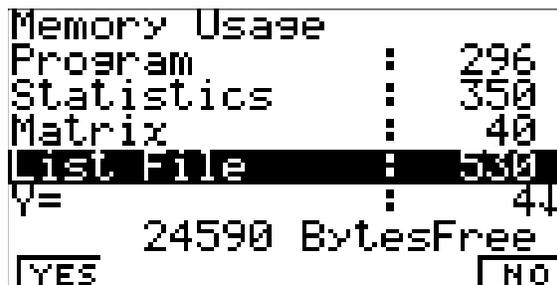
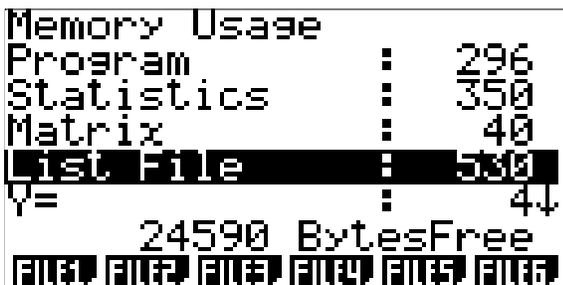
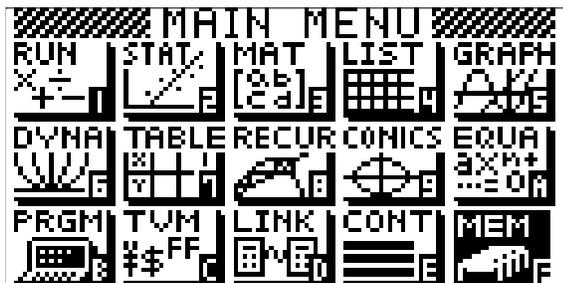
- ◆ Press **ENTER** to see the range. Record this on Handout 1.
- ◆ Similarly, determine mean and median in turn using **3:** and **4:** in the **2nd STAT MATH** menu.
- ◆ In a similar way, find the range, mean, median, and mode **LNRF**.

Activity 1. A Temperature Investigation

Handout 2: Casio CFX-9850GB Plus Calculator Instructions

Handout 2: CFX-9850GB Plus
ACTIVITY 1

- ◆ To clear the list, beginning from the **Main Menu**, press **F** **EXE**. Use the arrow keys to scroll down to **List File**. Press **F1** **F1** to clear the lists in **FILE1**.

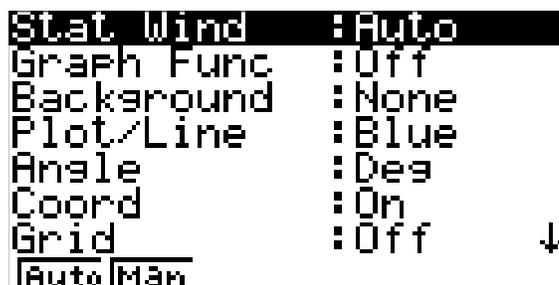


- ◆ Press **MENU** **2** to view Lists. Enter the temperatures from Nurse Careforu in **List 1** and those from Nurse Feelgood in **List 2**.

	List 1	List 2	List 3	List 4
4	98.6	101.4		
5	99	102.2		
6	97.3	99.3		
7	97	98.6		
8				

GRAPH CALC TEST DATA DIST ▸

- ◆ Press **SHIFT** **MENU** and set Stat Wind to Auto, and Graph Func Off.



CFX-9850GB Plus Keystrokes (continued):

- ◆ Press **EXE** to return to lists. Press **F1** **F6** **F1** to set **Graph Type** to **Scatter**. Then set **Xlist** to **List1**, and **Ylist** to **List2**.

	List 1	List 2	List 3	List 4
4	38.6	101.4		
5	39	102.2		
6	37.3	99.3		
7	37	98.6		
8				

GRAPH CALC TEST DISTR DIST ▸

	List 1	List 2	List 3	List 4
4	38.6	101.4		
5	39	102.2		
6	37.3	99.3		
7	37	98.6		
8				

GFPH1 GFPH2 GFPH3 SEL SET

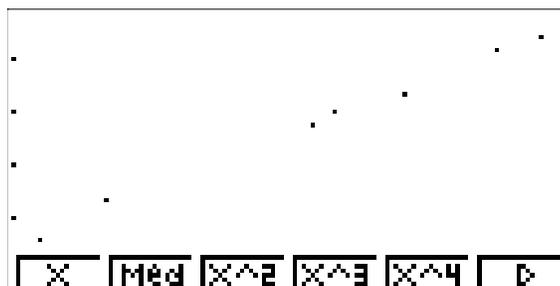
StatGraph1	
Graph Type	: Scatter
XList	: List1
YList	: List2
Frequency	: 1
Mark Type	: .
Graph Color	: Green
scat XY HPF	▸

- ◆ Press **EXE** **F4** and use the **F1** and **F2** keys to turn **StatGraph1** on and the others off. Press **F6** to draw the graph.

	List 1	List 2	List 3	List 4
4	38.6	101.4		
5	39	102.2		
6	37.3	99.3		
7	37	98.6		
8				

GFPH1 GFPH2 GFPH3 SEL SET

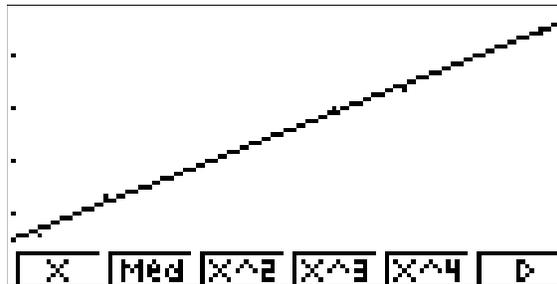
StatGraph1	: DrawOn
StatGraph2	: DrawOff
StatGraph3	: DrawOff
On Off	DRAW



Handout 2: CFX-9850GB Plus
ACTIVITY 1

CFX-9850GB Plus Keystrokes (continued):

- ◆ Establish a line of best fit and write its equation by pressing **F1**. Store this line in the graph menu by pressing **F4** **F5** **EXE**. Then press **F6** to graph $y=ax+b$ on the Homescreen.



Handout 2: CFX-9850GB Plus
ACTIVITY 1

- ◆ The r value is called the correlation coefficient. The closer the line comes to fitting or hitting all of the points, the closer the absolute value of this number is to 1. This r indicates a good fit of the line and the data points.
- ◆ Use the numbers for a and b to help answer the questions in #1 on Handout 1. Round any values to tenths place.
- ◆ Compare the results to the line you drew with the ruler in Handout 1.
- ◆ Use the graphing calculator to determine other statistical values as follows:

Press **EXIT** **EXIT** to return to the lists and press **F2** to choose **CALC**. Press **F6** and set **1Var Xlist** to **List1** (**List2** for Nurse Feelgood).

	List 1	List 2	List 3	List 4
1	38.3	101		
2	39.2	102.5		
3	38.2	100.8		
4	38.6	101.4		
5	39	102.2		
				38.3

	List 1	List 2	List 3	List 4
1	38.3	101		
2	39.2	102.5		
3	38.2	100.8		
4	38.6	101.4		
5	39	102.2		
				38.3

```

1Var XList :List1
1Var Freq  :1
2Var XList :List1
2Var YList :List2
2Var Freq  :1

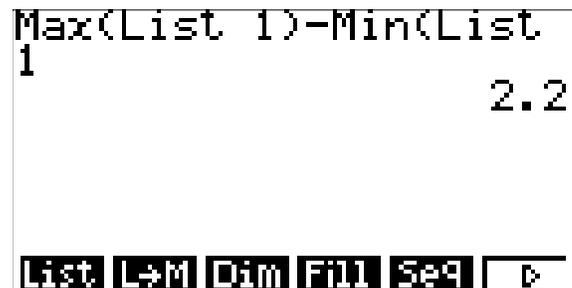
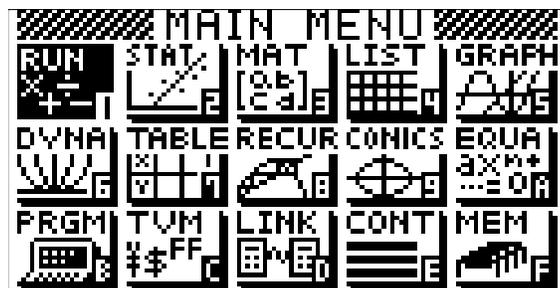
[List1 List2 List3 List4 List5 List6
    
```

CFX-9850GB Plus Keystrokes (continued):

- ◆ Press **EXE** **F1** and use the arrow keys to scroll through the various calculations for **List 1** and record the mean, median, and mode. The first number is the mean.

	List 1	List 2	List 3	List 4
1	38.3	101		
2	39.2	102.5		
3	38.2	100.8		
4	38.6	101.4		
5	39	102.2		
				38.3
	1VAR	2VAR	REG	SET

- ◆ To determine the range for the temperatures taken by Nurse Careforu, press **MENU** **1**. Press **OPTN** **F1** **F6** **F2** **F6** **F6** **F1** **1** **)** **-** **F6** **F1** **F6** **F6** **F1** **1** **EXE**.



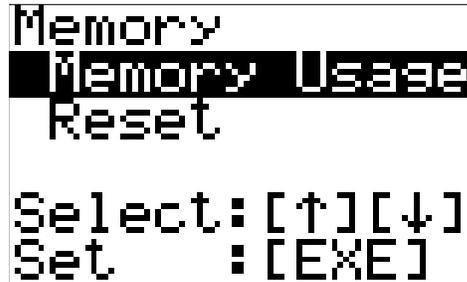
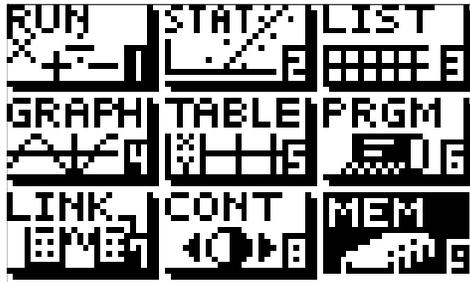
- ◆ Record this on Handout 1.
- ◆ Similarly, you can also determine mean in the run menu by pressing **F6** **F3** **F6** **F6** **F1** **1** **EXE**.
- ◆ Determine median by pressing **F6** **F3** **F6** **F6** **F1** **1** **EXE**.
- ◆ In a similar way, find the mode, range, mean, and median for Nurse Feelgood.

Handout 2: CFX-9850GB Plus
ACTIVITY 1

Activity 1. A Temperature Investigation

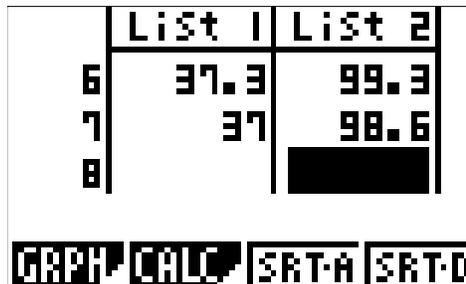
Handout 2: Casio FX-7400G Plus Calculator Instructions

- ◆ To clear the list, beginning from the **Main Menu**, press **9** **EXE**. Use the arrow keys to scroll down to **List**. Press **F1** **F1**.



Handout 2: FX-7400G Plus
ACTIVITY 1

- ◆ Press **MENU** **2** to view **Lists**. Enter the temperatures from Nurse Careforu in **List 1** and those from Nurse Feelgood in **List 2**.



- ◆ Press **SHIFT** **MENU** and set **S-Wind** to **Auto** and **G-Func** **Off**.



FX-7400G Plus Keystrokes (continued):

- ◆ Press **EXE** to return to lists. Press **F1** **F2** **F4** and set **G-Type** to **Scat**, **Xlist** to **List1**, and **Ylist** to **List2**.

	List 1	List 2
6	37.3	99.3
7	37	98.6
8		

GRAPH CALC SRT-A SRT-D

	List 1	List 2
6	37.3	99.3
7	37	98.6
8		

GP1 GP2 GP3

	List 1	List 2
6	37.3	99.3
7	37	98.6
8		

SEL SET

StatGraph1	
G- Type	:Scat
XList	:List1
YList	:List2
Freq	:1
Scat	XY Pie Stck

- ◆ Press **EXE** **F2** **F1** and use the **F1** and **F2** keys to turn **S-Grph1** on and the others off. Press **F4** to draw the graph.

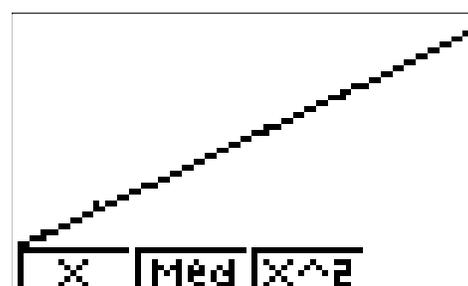
	List 1	List 2
1	38.2	101
2	39.2	102.5
3	38.2	100.8
		38.

SEL SET

S-Grph1	:On
S-Grph2	:Off
S-Grph3	:Off
On	Off DRAW

- ◆ Establish a line of best fit and write its equation by pressing **F1**. Store this line in the graph menu by pressing **F3** **EXE**. Then press **F4** to graph $y=ax+b$ on the Homescreen.

G-Func	:Y=
Y1	:
Y2	:
Y3	:
Y4	:
	Store[EXE]



Handout 2: FX-7400G Plus
ACTIVITY 1

FX-7400G Plus Keystrokes (continued):

- ◆ The r value is called the correlation coefficient. The closer the line comes to fitting or hitting all of the points, the closer the absolute value of this number is to 1. This r indicates a good fit of the line and the data points.
- ◆ Use the numbers for a and b to help answer the questions in #1 on Handout 1. Round any values to tenths place.
- ◆ Compare the results to the line you drew with the ruler in Handout 1.
- ◆ Use the graphing calculator to determine other statistical values as follows:

Press **QUIT** to return to the lists and press **F2** to choose **CALC**. Press **F4** and set **1Var X** to **List1** (**List2** for Nurse Feelgood).

	List 1	List 2
1	38.2	101
2	39.2	102.5
3	38.2	100.8
		38.3
GRAPH CALC SRT-A SRT-D		

	List 1	List 2
1	38.2	101
2	39.2	102.5
3	38.2	100.8
		38.3
1VAR 2VAR REG SET		

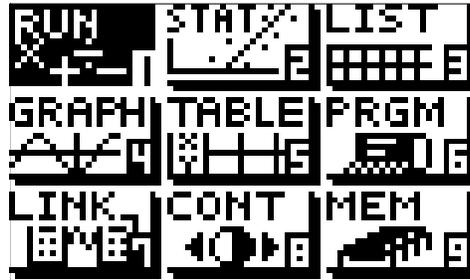
1Var	X	List1
1Var	F	: 1
2Var	X	: List1
2Var	Y	: List2
2Var	F	: 1
List1 List2 List3 List4		

- ◆ Press **EXE** **F1**. Use the arrow keys to scroll through the various calculations for **List 1**, and record the mean, median, and mode. The first number is the mean.

	List 1	List 2
1	38.2	101
2	39.2	102.5
3	38.2	100.8
		38.3
1VAR 2VAR REG SET		

FX-7400G Plus Keystrokes (continued):

- ◆ To determine the range for the temperatures taken by Nurse Careforu, press **MENU** **1**.
 Press **OPTN** **F1** **F2** **F3** **F4** **F1** **1** **)** **-** **F2** **F2** **F1** **1** **EXE**.



- ◆ Record this on Handout 1.
- ◆ Similarly, you can also determine mean in the run menu by pressing **F2** **F4** **F2** **F1** **1** **EXE**.
- ◆ Determine median by pressing **F2** **F2** **F1** **F2** **F1** **1** **EXE**.
- ◆ In a similar way, find the mode, range, mean, and median for Nurse Feelgood.

Handout 2: FX-7400G Plus
ACTIVITY 1

