Name _____ Hour _____

Statistics of Candy Bars Lab

Nutritional Information about Candy Bars					
ID Number	**Company / Candy**	**Serving Size (gm)**	**Total Calories**	**Calories from Fat**	**Total Fat (gm)**
1	Hershey - Mr. Good Bar	49	280	160	18
2	Hershey - Chocolate Bar	43	230	120	13
3	Hershey - Chocolate w/Almond	41	230	130	14
4	Hershey - Almond Joy	36	180	90	10
5	Hershey - Rolo	54	230	110	12
6	Hershey - 5th Avenue	57	280	110	12
7	Reese - Reese's Cup	45	240	130	14
8	Reese - Kit Kat	42	220	110	12
9	Reese - Nut Rageous	45	250	140	15
10	York - Peppermint Patty	42	170	35	4
11	Leaf - Heath Bar	40	210	110	13
12	M&M/Mars - Twix	57	280	130	14
13	M&M/Mars - Snickers	59	280	120	14
14	M&M/Mars - Milky Way	61	280	100	11
15	M&M/Mars - 3 Musketeers	60	260	70	8
16	D.L. Clark - Clark Bar	50	240	90	10
17	Nestle - 100 Grand	43	200	70	8
18	Nestle - Baby Ruth	60	280	110	12
19	Nestle - Milk Chocolate	41	220	110	13
20	Nestle - Butterfinger	42	200	70	8

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Steve Boast

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1. Enter the values from the columns labeled "ID Number" and "Calories from Fat" into $\mathbf{L_1}$ and $\mathbf{L_2}$, respectively.

2. Find the following statistics for the number of calories from fat in the sample of candy bars.

   a. $\bar{x} =$ b. $s_x =$

   c. Explain the procedure you used to determine these two statistics.

3. Create a histogram of these data with $\mathbf{L_1}$ plotted on the *x*-axis and $\mathbf{L_2}$ plotted on the *y*-axis as **frequency**.

   a. In this type of graph, what does the "frequency" of the data actually represent?

   b. Make a sketch of your histogram in the space at right. Show your **WINDOW** settings below.

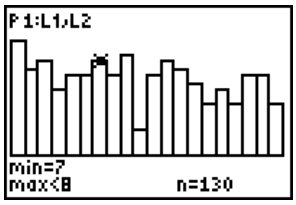
   Note: Set **Ymin** so that the **TRACE** values will not overwrite portions of the graph when they are displayed.

   Xmin = **Xmax =** **Xscl =**

   Ymin = **Ymax =** **Yscl =**

   c. What does each "bar" of the histogram represent?

   d. In the histogram at right, what information is being displayed?



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e. Graph the constant function $Y_1 =$ (the value of $\bar{x}$) on the same axes as the histogram. (You need to in dot mode and set **Xres** = 2 to see a dotted line.) Sketch this on your graph in part b.

(1) What do the bars jutting above the line $Y_1 = \bar{x}$ represent?

(2) What do the bars jutting below the line $Y_1 = \bar{x}$ represent?

(3) Should there be as many bars jutting below the average as above? Why?

f. How many bars **are** jutting below the average? _____ above the average? _____

g. Have the instructor print a copy of your calculator screen showing the histogram and the graph of the line $Y_1 = \bar{x}$. **Carefully**, cut out the individual bars above the average.

a. Arrange them so that they will fill the spaces below the average. (You may have to cut the small bars into smaller pieces to accomplish this.) You should end up with a figure resembling the one at right.

b. What concept or idea discussed in class is being illustrated by this diagram? Explain

c. Does this process work for any data set?

d. What did we decide to do to avoid this problem? i.e. the average distance from the mean always equaling zero

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4. Write the general formula for the following statistics and identify what they represent:

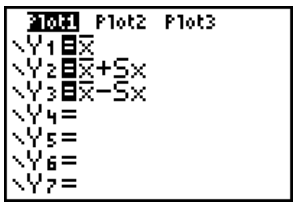
$s_x =$ $\qquad\qquad$ $s_x =$

a. What is the difference between these two statistics?

b. What are the values for s_x and s_x for the number of calories from fat?

c. Explain what s_x represents in the context of this problem (number of fat calories).

d. Use the settings shown at right for your **Y=** screen. (You must have already done a **1-Var Stats L_2** before entering these settings.) Explain briefly how you entered the settings.



NOTE: *Sx* is the sample standard deviation, not 5*x*.

e. Make a sketch of the histogram and lines in the space at right.

(1) What does the line $Y_1 = \bar{x}$ represent?

(2) What does the line $Y_2 = \bar{x} + s_x$ represent?

(3) What does the line $Y_2 = \bar{x} - s_x$ represent?

(4) What percent of the data is "trapped" in a one standard deviation band on either side of the mean?