TAKE IT TO THE MAT

A NEWSLETTER ADDRESSING THE FINER POINTS OF MATHEMATICS INSTRUCTION

Southern Nevada Regional Professional Development Program
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In the October through December 2003 issues of *Take It to the MAT*, we explored comparing distributions of data with back-to-back stem-and-leaf plots. One of the difficulties with stemplots is constructing them with large quantities of data. In the plot at right, there are 53 data for the crispy candies, 60 for plain. Those are not unreasonable sizes for making stem-and-leaf plots, but larger sets of data would create huge graphs requiring a long time to construct.

Plain Mass (g)		Crispy Mass (g)
	5	8
	6	4
9	6	669
4	7	123
97766	7	5569
444333221	8	0011112224
998887777777777666666665555	8	56778
433222110000	9	2344
888555	9	57
	10	333
	10	56777789
	11	1
	11	678
	12	234
	12	
	13	
	13	6

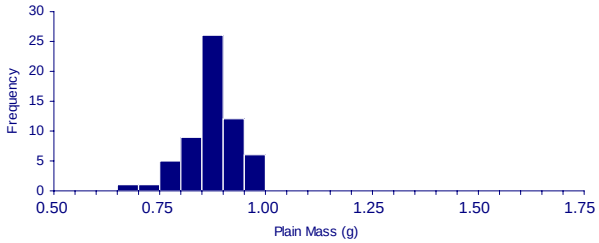
Hi: 1.66 g

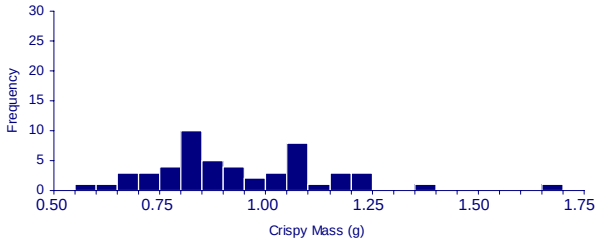
Left side: 9|6 represents 0.69 g

Right side: 6|9 represents 0.69 g

One alternative is to use histograms. A histogram is a graph that uses bars to show the frequency of observations within given intervals. Unless the data set is small, it is desirable to have a frequency table first. A frequency table for the candy data is provided at right.

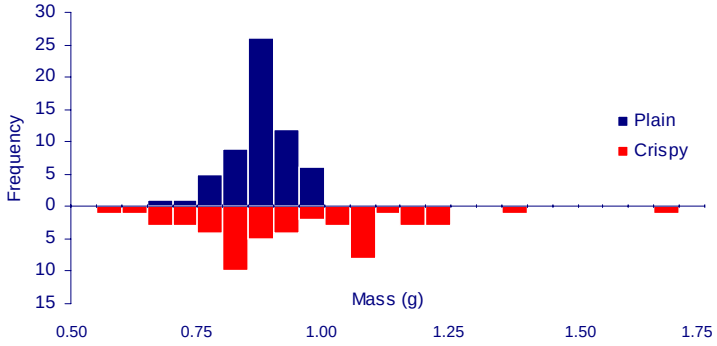
	Frequency	
Mass (g)	Plain	Crispy
0.55–0.59		1
0.60–0.64		1
0.65–0.69	1	3
0.70–0.74	1	3
0.75–0.79	5	4
0.80–0.84	9	10
0.85–0.89	26	5
0.90–0.94	12	4
0.95–0.99	6	2
1.00–1.04		3
1.05–1.09		8
1.10–1.14		1
1.15–1.19		3
1.20–1.24		3
1.35–1.39		
1.30–1.34		
1.35–1.39		1
1.40–1.44		
1.45–1.49		
1.50–1.54		
1.55–1.59		
1.60–1.64		
1.60–1.69		1





There are two ways we could make comparative histograms. The first method is similar to the one we used in the October 2003 issue with line plots—making two histograms with the same scale and stacking them vertically.

A second method is to draw the bars "back-to-back" similar to the stemplot above. The orientation could be horizontal, as well.



Remember, if the idea here is to get a big picture comparison of the shape, center, and spread of the two distributions, then details are just "noise" that clutter the graph.

What can we say about the plain candies compared to the crispy ones?