

# TAKE IT TO THE MAT

A NEWSLETTER ADDRESSING THE FINER POINTS OF MATHEMATICS INSTRUCTION



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In the October 2003 issue of *Take It to the MAT*, we looked at comparing distributions with line plots of the same scale. In this edition, we'll compare data sets using stem-and-leaf plots.

Take a glance at the line plot for crispy candy masses at the bottom of the page. The shape of the distribution is difficult to see. This is due to the wide spread of the data when compared to the precision of our measurement. Because of this a different type of display is needed. A stem-and-leaf plot could be useful in this case. Since our desire is to compare the distributions, back-to-back stemplots will be used.

The distribution of crispy candies is fairly symmetric and appears that it may have two peaks. The shape of the plain candies is a little tougher to describe because our data only lies in four stems.

Plain Mass (g)		Crispy Mass (g)
	5	8
	6	4669
	7	1235569
9988877777777777777666666555444333221	8	001111222456778
888555433222110000	9	234457
	10	33356777789
	11	1678
	12	234
	13	6
	14	
	15	
	16	6

Left side:  
9|6 represents 0.69 g

Right side:  
6|9 represents 0.69 g

The greater spread of the crispy masses is as clear as it was when we constructed line plots. Looking for the centers of the distribution, it appears that the center of the plain candies is in the 0.8 g stem and the center of the crispy candies is in the 0.9 g stem. The stemplot makes it clear that crispy candies are, on average, more massive than plain candies.

Since the stemplot retains the original information while organizing it into intervals (0.50–0.59 g, 0.60–0.69 g, etc.), we can clearly see the value of the crispy outlier 1.66 g. We could also use the data values to determine the medians, ranges, quartiles, or about any other measures of center, spread, or location for the two data sets.

A couple of questions remain. What is the shape of the distribution of plain candies, since it may be obscured by the fact that we have only four stems? Do those two peaks in the stemplot of the crispy masses indicate that there may be two smaller, distinct groups of crispy candies? We'll answer those questions, and more, next time.

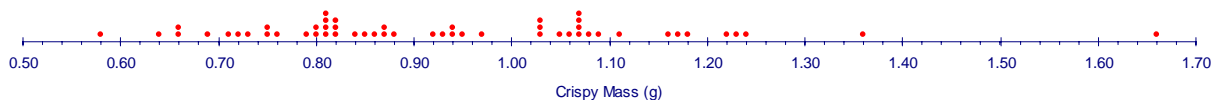


Table 1: Crispy Masses (g)

0.58	0.82	1.05
0.64	0.82	1.06
0.66	0.82	1.07
0.66	0.84	1.07
0.69	0.85	1.07
0.71	0.86	1.07
0.72	0.87	1.08
0.73	0.87	1.09
0.75	0.88	1.11
0.75	0.92	1.16
0.76	0.93	1.17
0.79	0.94	1.18
0.80	0.94	1.22
0.80	0.95	1.23
0.81	0.97	1.24
0.81	1.03	1.36
0.81	1.03	1.66
0.81	1.03	

Table 2: Plain Masses (g)

0.69	0.86	0.89
0.74	0.86	0.89
0.76	0.86	0.90
0.76	0.86	0.90
0.77	0.86	0.90
0.77	0.86	0.90
0.79	0.86	0.91
0.81	0.87	0.91
0.82	0.87	0.92
0.82	0.87	0.92
0.83	0.87	0.92
0.83	0.87	0.93
0.83	0.87	0.93
0.84	0.87	0.94
0.84	0.87	0.95
0.84	0.87	0.95
0.85	0.87	0.95
0.85	0.88	0.98
0.85	0.88	0.98
0.85	0.88	0.98