TAKE IT TO THE MAT

A NEWSLETTER ADDRESSING THE FINER POINTS OF MATHEMATICS INSTRUCTION

Southern Nevada Regional Professional Development Program
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Welcome back to school! This issue of *Take It to the MAT* begins the fifth year of the Regional Professional Development Program's newsletter on mathematics instruction. Good luck in the upcoming school year. Here we go!

In the January through May 2003 issues of *Take It to the MAT*, we looked at how to construct various types of graphs for categorical data. Those graphs were object graphs, picture graphs, bar graphs and circle graphs. *Categorical* data is characterized by having a qualitative nature; it can be classified by some name or label. Contrast this with *numerical* data, which is quantitative in nature. Numerical data comes from counting or measuring. In the next few issues of *Take It to the MAT*, we will examine graphs to represent numerical data.

The first type of graph we will investigate is a *line plot*, or what the authors of this newsletter like to call a *number line plot*. Line plots work very well with the following types of data:

Count data. This means that each piece of data is the result of counting discrete objects, like raisins in a box, cars in a parking lot, or students in a classroom.

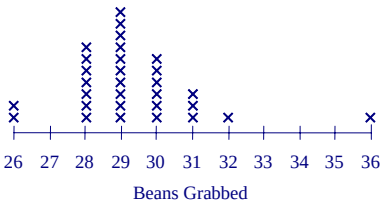
Data that have been rounded. Here we mean that we have measured something and rounded the measurement to a particular value. For example, we might measure our kids' heights and round to the nearest inch.

Data that is not very spread out. A line plot of populations of Nevada towns would be difficult to construct, because we would need a number line that extends from 232 (Goodsprings) to 478,434 (Las Vegas). That's a long graph! (Populations are from the 2000 U.S. Census.)

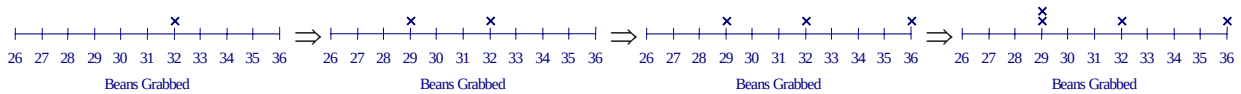
Beans Grabbed	
Student	Beans
ALLAN	32
ANITA	29
ARNOLD	36
BILLY	29
CAROL	29
CARRIE	30
CHLOE	28
CONNIE	26
ELMER	29
GLENDA	30
HECTOR	31
JACK	28
JEFF	26
JIMMY	29
JOEL	29
JOSE	29
KELLY	28
LYNN	31
MELVIN	31
MIKE	28
NICOLE	29
PAMELA	30
ROBERTO	29
RONALD	28
SAM	30
SANDRA	30
SARAH	28
STANLEY	30
STEPH	29
TAMMY	28

Consider the following scenario. Students have asked the question, "How many beans can each of us grab with one hand?" Each student reached into a large jar of beans and grabbed as many as they could, then counted them. The results are recorded in the table at right. We have a long list of numbers, but it's hard to get a feel for how they are distributed.

A pictorial representation of the data is called for. A line plot nicely fits the conditions outlined above; we have count data that is not widely spread out. Drawing a number line and placing an "x" or other symbol above the number line for each datum creates a line plot. The symbols stack up building something similar to a bar graph, except that we don't usually include a vertical scale. It's important that the symbols be equally spaced. A line plot of our data is shown at right.



The line plot is a neat "build-as-you-go" type of graph. If we have an idea of how many beans our students may potentially grab, we could have drawn the number line ahead of time on the whiteboard or butcher paper, ready to receive the data. If our students were to come to the jar one at a time, then draw and count their beans, each could in turn mark the number of beans on the number line. For example, if the class above drew their beans in alphabetical order, we would see the graph build as follows:



What can you determine about the class from the completed line plot above? Are there any questions you might ask about the class? In the next issue, we'll discuss some of those things and also look at a couple variations of the line plot.