

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 this issue of *Take It to the MAT*, we will continue our exploration of bar graphs and common mistakes that students make in creating them. Once again, we'll use the colored candy data we gathered in the January 2003 issue.

One area of difficulty for students in the construction of graphs is in proper scaling. The scale of the graph must be consistent as seen in the graph at right. There is one more orange candy than blue, so the orange bar is one unit longer. There are three times as many blue candies as green, so the blue bar is three times as long.

Another place students have trouble is establishing the scale of a graph and properly labeling it. In Figure 1, the count axis is labeled in such a way that each tick mark represents one unit. Zero is clearly marked and the spacing of the units is equal along the *Count* axis.

What if we had wanted to use a different scale for our graph, that is, what if we wanted to label our tick marks differently? For example, we could label our axis in units of two instead of one as in Figure 2. Gridlines have been added for clarity. Even though there are three blue candies, we can still draw its bar; its top lies halfway between the 2 and 4 marks.

In practicality, this scaling by twos is not necessary for the data given. The counts of the candies are small enough that scaling by ones is clear and still concise. The graph is provided merely as a point of discussion. But what if we had 45 red, 12 green, 30 blue, 43 orange, and 71 yellow? Then, scaling by tens would be more appropriate than ones or twos, as shown in Figure 3. After all, we don't want a graph that is two feet long and an inch wide!

Lastly, make note of where the labels are on the *Count* axis. They are all at the same location as the tick marks. Very often students want to place the labels in between the tick marks. This may be acceptable when showing graphs with discrete objects, like the one shown in Figure 5, or when creating a picture graph, but it is not proper when creating bar graphs. Placing the labels in between the tick marks may confuse the reader as to where the values associated with the labels occur.

In Figure 4, are the labels at the tick marks, or between them? Is there one green candy, or two? And how would one indicate zero candies of a certain color?

Color	Tally	Count
Red	////	4
Green	/	1
Blue	///	3
Orange	////	4
Yellow	####	7

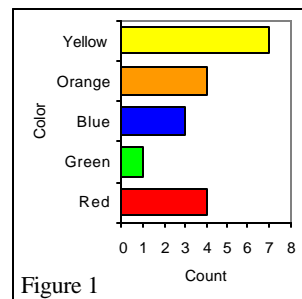


Figure 1

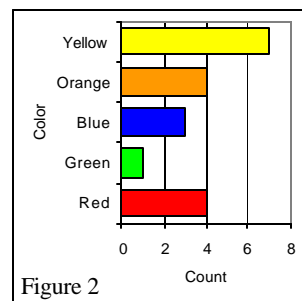


Figure 2

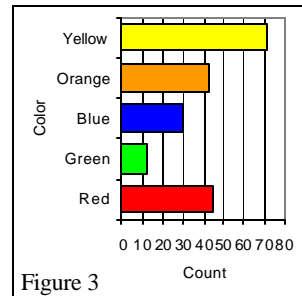


Figure 3

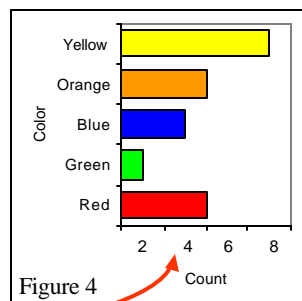


Figure 4

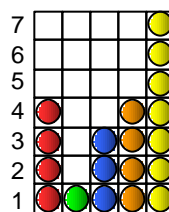


Figure 5

Incorrect scale!