Mean, Median and Mode

Mean, Median, and Mode are all "indicators of central tendency." That's a fancy way of saying that statisticians can use any or all of them to present, arrange, and distort data, depending on what they want you to believe. There is an old saying, "Figures don't lie." But most people who work with data know that "Liars can figure."

The Mean is the "average," so we'll come back to it.

Median: Where is the median on a highway? It's down the middle! Arrange your data (numbers) from smallest to greatest. The median is the middle number if there is an odd number of entries; if you have an even number of entries, the median is halfway between the two middle entries.

Mode: The Mode is the one that shows up the **most**. When I first introduce this topic, I call the Mode the "Mode-st," pronounced so it rhymes with "most."

Mean: Now that we've covered the two "minor" M's, we can return to Mean. Mean "means" average. Add all the terms together and divide by the number of terms. Note: statisticians will tell you that all three terms can be used to represent the average member of a group, but when you say "average," the Mean is the first one to come to mind.

Example: 12, 4, 8, 2, 3, 4, 9, 4, 15, 37

Put them in order: 2, 3, 4, 4, 4, 8, 9, 12, 15, 37

The **Median** is 6. The two middle numbers are 4 and 8, and 6 is their average.
2, 3, 4, 4, 4, 8, 9, 12, 15, 37

The **Mode** is 4. Four shows up three times and the others only once. If all numbers show up the same, there is no mode. If there is a tie, the set is bimodal, trimodal, or multi-modal.

The **Mean** is 9.8. The total of the ten elements is 98. $98 \div 10 = 9.8$

Side-lights: The **Range** of this set is 35 (37 – 2). If you think this is not important, it cost a CPA $150,000 on *Are You Smarter than a Fifth-Grader?*

Since 37 is much different from the others, it is called an "**outlier**." When we have an outlier, the Mean is not the best method for describing a set.

The Mode is the only one of the three M's which is always (when it exists) a member of the set.

Suppose all the houses in a neighborhood are evaluated for $80,000 to $150,000, except for one historic mansion which is valued at 3 million dollars. If we wanted the property values to sound high, we would use the Mean, since it allows the mansion to inflate the total value. If several of the houses have the same value, the Mode could be used. The Median, however, is probably the best indicator, since it is the value of the middle-priced house, as opposed to "the house in the middle," which depends only on location.

Suppose you apply for a job at a business. If the workers make $30,000 per year, but the CEO draws $4 million, how much does the "average" employee make? Do you see how the mode and median represent the "average" better than the mean?