Abstract: We will have some fun demolishing several enticing examples that commonly are used in statistics textbooks to illustrate the mean, median, and mode. A little calculus backed up by a little data show that these concepts are not as intuitive as they appear.

Highway Speed Fallacy
You are driving on the highway and adjust your speed until the number of cars that you pass is equal to the number of cars that pass you. Then, by definition, your speed is the median speed on the highway. “The Average Speed on the Highway,” Larry Clevenson, Mark Schilling, Ann Watkins, and William Watkins, The College Mathematics Journal, 32 (May 2001) 169-171.

Bimodal Height Fallacy

Weight of the Loot Fallacy
In the mystery Hunting Badger by Tony Hillerman, the legendary Joe Leaphorn of the Navajo Tribal Police is trying to determine if the three men who raided the Ute tribe’s gambling casino could have escaped on foot into the maze of canyons on the Utah-Arizona border. The loot comes to about $450,000 and Leaphorn wants to estimate how much it weighs. He phones a friend at a bank who knows the weight of a dollar bill and Leaphorn reports that “She said if we decide the median of bills in the loot was about ten dollars, which she thought would be close, that would be forty-five thousand bills. The weight of that would be just about one hundred and seven pounds and eleven ounces.”

The Biased Coin Fallacy
It is possible to weight a coin so that when you toss it and catch it at a random spot in the air the probability it comes up heads is more than 1/2. “You Can Load a Die, But You Can’t Bias a Coin,” Andrew Gelman and Deborah Nolan, The American Statistician, 56 (November 2002) 308-311.

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