1116-E5-47 **Paul R. Bouthellier*** (pbouthe@pitt.edu), 504 East Main Street, University of Pittsburgh-Titusville, Titusville, PA 16354. *Statistical Simulations of Lottery Tickets.*

In our statistics classes we can illustrate some of the basic rules of probability by deriving the chances of winning various amounts on a given lottery ticket. These probabilities are then used to derive the expected value of the ticket. However, it is far more interesting to allow students to design their own lottery tickets. The students have to decide what is considered winning, calculate the probabilities of winning and how much the prizes should be to make sure the lottery ticket will return a certain percent profit to the state with a probability of near 1. Simulations then need to be run to estimate the mean and standard deviation of such tickets given a finite number, say 10,000, are sold a week in order to show the tickets perform as expected. Such simulations need to be run a large number of times to ensure consistent results. Java programs and interactive web pages will be used to simulate our results with a lottery ticket called "Poker Kings" which simulates a scratch-off ticket. A person selects 5 out of 52 possible "cards" and wins a given amount if they get certain poker hands. Allowing students to design their own lottery tickets (and games) gives students an unlimited number of possible, and practical, real-world examples. (Received June 22, 2015)