1003-B1-380 **Melvin G. Royer*** (`melvin.royer@indwes.edu`), Indiana Wesleyan University, 4201 S Washington St, Marion, IN 46953. *Calculus Demonstration: Economical Radar Guns.*

A discussion of a Calculus I demonstration designed to introduce limits in the context of the derivative as a rate of change. The demonstration considers how one might use a meter stick and stopwatch to estimate the velocity of a ball as it reaches the bottom of an inclined plane. A brief physical experiment or computer simulation generates suitable distance-time measurements. The relationship of instantaneous and average velocities motivates the idea of limit, and the hinderance of having only discrete data measurements is overcome using a software-generated regression function. With an approximate position function in hand, a physically-meaningful limit of the average velocity can be discussed and computed.

Appealing features of the demonstration include the problem's historical significance, the natural placement of the activity within the first few days of a Calculus I course, the feasible alternative of doing parts of the demonstration as a student group activity, and the tie-in to students' prior conceptions/misconceptions of velocity. (Received September 13, 2004)