Dexter C. Whittinghill* (whittinghill@rowan.edu), Department of Mathematics, Rowan University, Glassboro, NJ 08028. Modeling the Gummy Bear Launcher as a Simple Computer Experiment.

We describe the Cobb gummy bear launcher, found in Activity Based Statistics, by Scheaffer, Watkins, Gnanadesikan and Witmer (Wiley, 2008). Long used as a hands-on manipulative to create experimental data that can be used to motivate regression and the analysis of variance, we present a mathematical use of the launcher. The machine that is the launcher, and the physical process of launching a gummy bear, can be modeled mathematically with fairly simple functions—trigonometry, polynomials and the classic projectile path from calculus—though in a complicated composition. Unlike results from a physical, launcher experiment, the output of “runs” of this model are deterministic data: the same input always gives the same output. The science of analyzing the output from such a “computer experiment” inspired a new branch of statistics in the late 20th Century. (For instance, running a climate model is a computer experiment.) Finally, we present an analysis of the gummy bear model. (Received September 19, 2011)