1125-J5-1500 **Dan Kalman*** (kalman@american.edu). *A Discrete Approach to Continuous Logistic Growth.* Logistic growth is a common modeling topic in courses that precede calculus. The discrete version is characterized by a difference equation of the form $P_{n+1} = m(L - P_n)P_n$, where $m, L > 0$ are real parameters. These models are easily motivated as a refinement of exponential growth, and when $0 \leq mL \leq 3$, produce nicely behaved examples of limited growth. However, there is no general closed form solution to the difference equation, limiting the analysis methods accessible to precalculus students. Continuous logistic growth is defined by an equation of the form $P(t) = \frac{A}{1+Bb^t}$. These models are more easily analyzed in a precalculus context, but are harder to motivate.

This talk presents a synthesis of the two forms of logistic growth. It arises naturally as a refinement of the difference equation above. The refined difference equation is solvable by elementary methods, and the solutions are none other than continuous logistic growth curves. This development offers a meaningful example of successively refining a model by reconsidering its assumptions. As an added bonus, it inspires (re)discovery of a beautiful approach to solving the logistic growth differential equation. (Received September 17, 2016)