1128-28-4 **Laramie S Paxton*** (lpaxton@math.wsu.edu). *A Sequential Approach to the Henstock Integral.*

The theory of integration over $\mathbb{R}$ is rich with techniques as well as necessary and sufficient conditions under which integration can be performed. Of the many different types of integrals that have been developed since the days of Newton and Leibniz, one relative newcomer is that of the Henstock integral, aka the Henstock-Kurzweil integral, Generalized Riemann integral, or gauge integral, which was discovered independently by Henstock and Kurzweil in the mid-1950s. In this paper, we develop an alternative, sequential definition of the Henstock integral over closed intervals in $\mathbb{R}$ that we denote as the Sequential Henstock integral. We show its equivalence to the standard $\epsilon - \delta$ definition of the Henstock integral as well as to a Darboux definition and to a topological definition of the Henstock integral. We then prove the fundamental properties and theorems, including two convergence theorems, for the Sequential Henstock integral and offer several suggestions for further study. (Received September 18, 2016)