1135-D5-1019 **Gabriella Harris***, Towson University, Department of Mathematics, 8000 York Rd., Towson, MD 21252, and **Kimberly Corum**. *Using Multivariable Mathematical Modeling Activities to Facilitate Inquiry-Based Teaching and Learning: The Derivation of Ampere's Law.*

Mathematical modeling is the process of using mathematics as a way to understand and solve real-world problems. Modeling activities can be used to facilitate inquiry-based learning (IBL), as they provide an environment for students to engage in authentic mathematical practices. One such modeling activity is the derivation of Ampere's Law. Ampere's Law ($B = \mu \frac{N}{L} I$) relates the strength of the magnetic field generated by a solenoid ($B$) to the number of coils of wire ($N$), the length of the solenoid ($L$), and electric current ($I$). A solenoid is a coil of conductive wire; when electric current flows through the wire, the coil generates a magnetic field. Solenoids are an integral component in a number of historic and modern-day technologies. While Ampere's Law is a multivariable mathematical model, it can be derived experimentally by systematically varying the different parameters of a solenoid. By sharing our findings from several successful implementations of the Deriving Ampere's Law activity with students, ranging from rising eighth grade students to undergraduate mathematics and science majors, we hope that others will be inspired to develop similar activities to use in their own teaching. (Received September 19, 2017)