Parameterization of curves has been identified as a challenging topic for students in multivariable calculus courses. Encouraged by the positive research results of inquiry-based learning (IBL) on student performance and attitudes, our team composed of mathematics professors and undergraduate math students conducted a research study to develop curricular materials aimed at supporting student understanding of this topic. For this study we conducted an extensive literature review, studied popular multivariable calculus textbooks, and consulted with experienced instructors to create an original IBL module. In this talk we will present the details of the module that engages students in collaborative discovery to gain a deep conceptual understanding of parameterization in addition to providing opportunities for procedural practice. (Received September 17, 2013)