

Using Licorice to Reinvent Trigonometric Functions

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Nicole Engelke is an assistant professor of mathematics at West Virginia University. Her research focuses on how students learn and understand calculus concepts, particularly contextual questions. She is actively involved in the special interest group of the Mathematical Association of America on research in undergraduate mathematics education.



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Functions are a critical part of today's mathematics. It took hundreds of years for the function concept to develop into what we understand a function to be today. The idea of functions is necessary for modeling many of the phenomena that mathematicians and scientists study. The AMATYC Crossroads standards urge mathematics educators to develop in their students an understanding of functions that allows them to use appropriate function notation, interpret functions that arise in applications, and analyze functions using different representations. In developing student thinking about functions, the standards indicate that activities should optimize learning and be accessible to diverse populations of students with differing learning styles. We present an activity in which students build their understanding of the sine function. Students start with concrete physical measurements, represent these measurements as they construct a graph, and conclude with the abstract representation of the function, $f(x) = \sin x$. Throughout the activity, students are engaged in activities that should reach tactile, visual, and auditory learners. This activity has been used successfully in college level precalculus courses with diverse populations.

State University, Fullerton. He specializes in teaching mathematics-content courses for elementary and middle school preservice and in-service teachers. His research investigates high school and college students' understanding of mathematics concepts and their perceptions of the relationships among these concepts.