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Shelby Stanhope* (shelby.stanhope@afacademy.af.edu). *Supporting Spatial Conceptualization in Multivariable Calculus Using 3D Printed Surfaces, the Visualization Applet CalcPlot3D, and Experiential Learning Activities.*

A unique transition occurs as students enter multivariable calculus. Up to this point, students have spent their mathematical careers becoming experts in the two-dimensional xy -plane. Adding another dimension allows us to explore this 3D world we live in, but the transition to three dimensional mathematical thinking does not come easily to many students. To best support students' spatial understanding of concepts in the course, we should provide interactive computer visualizations, tactile manipulatives, and experiential learning opportunities. In this presentation, I will discuss the use of 3D printed surfaces in the classroom. Students can touch, write on, and rotate the surfaces as they work with a classmate to build their understanding of new concepts. Additionally, the free applet CalcPlot3D can be used to provide interactive computer visualizations. The program requires no coding and is extremely accessible to students. I will present demonstrations that instructors can use to illuminate concepts and visualizations that students can easily create themselves. Finally, I will discuss two experiential learning activities, which provide the opportunity for students to see math in action, bringing together concepts they have seen, but can now feel and experience themselves. (Received September 15, 2020)