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Three-dimensional printing: a journey in visualization.

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Summary: Imagine high school students glued to computer screens – not playing video games but applying their mathematical knowledge of functions to the design of three-dimensional sculptures. Imagine these students engaging in rich discourse as they transform functions of their choosing to design unique creations. Now, imagine these students using three-dimensional printers to make their mathematical sculptures come into being as lasting artifacts of what they have accomplished in mathematics class. At the University of Illinois at Urbana-Champaign, researchers and educators have successfully collaborated to turn this idea into reality. Using Mathematica software, a data projector, a magnifying glass, a mirror, a liquid polymer, and about twenty dollars' worth of materials from a hardware store, students can apply their mathematical knowledge to designing and creating their own three-dimensional plastic sculptures. As students decide on the specific sculptures they wish to create, they engage in meaningful problem solving to determine which functions or inequalities will turn their mental images into real objects. (ERIC)

Classification: U60 U70 D30

Keywords: high school students; secondary school; college school cooperation; computer peripherals; cost effectiveness; sculpture; plastics; computer software; theory practice relationship; visualization; visual aids
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