

1135-VD-1566 **Betty Love*** (blove@unomaha.edu), Mathematics Department, University of Nebraska - Omaha, Omaha, NE 68182, and **Victor Winter, Michael Matthews** and **Michelle Friend**. *Using Bricklayer to fuse mathematical thinking, computational thinking, and art.*

Bricklayer is a tech-centric pedagogical tool suite where visual art provides the domain in which mathematical and computational thinking can be taught in ways that are engaging as well as technically meaningful. Bricklayer programs, written in the functional programming language SML, can produce LEGO artifacts, Minecraft artifacts, and artifacts suitable for 3D printing. Effective use of computers ultimately rests on one's ability to understand computational sequences in terms of their underlying patterns. Given this perspective, programming is the art of structuring computations to expose patterns in ways that can be leveraged by the machine. Visual domains, such as that of Bricklayer, provide tremendous cognitive opportunities for pattern recognition. The discrete nature of the Bricklayer domain provides a setting in which various classes of patterns, including arithmetic, geometric, and evolutionary, can be understood through abstractions found in algebra as well as discrete mathematics. The abstractions of functional programming languages are closely related to mathematical functions. Therefore, functional programming languages facilitate transfer between algebra and programming because they rely on the same underlying conceptual model as functions in algebra. (Received September 23, 2017)