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Mathematical Variations on Woven Figure Eights

Certain forms of traditional mat weaving practiced in several regions of Southeast Asia involve open-work, i.e., folding back specific strands to forms discrete holes in the surface of the mat. These techniques present the potential for mathematical exploration that can lead to the creation of plaited forms with interesting mathematical properties. This talk will focus on simplified versions of this technique that produce artifacts which are variations of figure eights. The artifacts provide visual representations of different mathematical concepts such as symmetries, permutations, modular arithmetic, parity, and equivalence relations. Various models will be displayed during the talk. Hands-on activities can be used in mathematics classrooms of various levels, from elementary school to upper level undergraduate math courses.