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Gwen Laura Fisher* (glfisher@calpoly.edu), Mathematics Department, California Polytechnic State University, San Luis Obispo, CA 93407. *The Symmetries of Beaded Beads.*

Symmetry groups of real, bounded, three-dimensional objects are described mathematically by the three-dimensional point groups. Bead weaving is a rapidly developing art form, which provides a new medium that is rich for discovering and displaying physical representations of these symmetry groups.

The three-dimensional point groups fall into two categories. First are the prismatic groups and their subgroups, and second are the groups and subgroups of symmetries of regular solids. The seven symmetry groups (and subgroups) of the regular solids include the tetrahedral group, the cube-octahedral group, and the icosahedral group.

A prismatic group is the group of symmetries of a right regular prism. As such, the prismatic groups form an infinite class, one group for each natural number. Subgroups of prismatic groups form seven classes, corresponding with the seven border (i.e., frieze) patterns.

One can sew physical representations of all 14 types of three-dimensional point groups with only beads, a needle, and thread. These symmetric beaded objects are called beaded beads, a form of bead weaving. Most beaded bead makers limit their designs to five or fewer symmetry groups. Inspired by groups, I produced many new designs, many of which are hollow. (Received September 01, 2005)