

Meeting: 1003, Atlanta, Georgia, MAA CP N1, MAA Session on Teaching Visualization Skills

1003-N1-685 **Gwen L Fisher*** (glfisher@calpoly.edu), Mathematics Department, California Polytechnic State University, San Luis Obispo, CA 93407. *Teaching Students to Illustrate Border and Wallpaper Patterns*. Preliminary report.

In preparation for a new course in Mathematics and Visual Art, illustrations were designed to aid students in their abilities to produce their own examples of the 7 border symmetry groups and the 17 wallpaper symmetry groups. The illustrations were designed to address a big obstacle: Many college students have difficulty organizing their hand drawings for even simple periodic patterns. Consequently, a complete set of illustrations was developed to guide students in drawing their own examples of the symmetry groups. All of the border and wallpaper groups are illustrated with the use of just two grids: the standard square grid and the isometric grid. Only two types of grids are needed because each of these symmetry groups is a subgroup of the symmetry group of one of these two grids. The artist M. C. Escher writes of his work, “In Regular Division of the Plane 1, a process of development takes place. The viewer is invited to follow this by going through the phases, one after the other, of a band of images that... fills the image plane... through... stages of growth and metamorphosis...” Similarly, the images herein attempt to guide the viewer through their stages of development, from simple to complicated. The intention is to allow students to see, step by step, how each drawing was made. (Received September 27, 2004)