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Curriculum Units by Fellows of the National Initiative
2010 Volume IV: The Mathematics of Wallpaper

Math and Design

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by Rosemary G. Schmitt

If you are looking for a way to incorporate symmetry into your curriculum, and math into art class, then this unit may provide the opportunity you are looking for. This unit is designed for middle school students, preferably eighth grade. It focuses on symmetry and the transformations of designs. It starts with introducing symmetry including the transformation of reflection, rotation, translation and the less well-known transformation of glide reflection. We will also take a look at frieze patterns (a repeating decorative pattern commonly seen around the tops of older buildings) and try creating our own geometric pattern.

Students will be able to recognize and describe symmetries of designs by finding center of rotation and axes of symmetry. Then they will make their own design with one or more specified symmetries. They will be expected to perform reflections, translations, and rotations to create a frieze pattern of their own. They will incorporate their frieze pattern into an art project where they will look at art work by Shepard Fairey (a contemporary artist) and use him as inspiration for their own art piece. This unit contains the most important concepts stressed in transformation and symmetries for an eighth grade class.

(Developed for Pre-Algebra, grade 8; recommended for Pre-Algebra, grade 8)

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