962-N1-611	**Susan L Addington*** (`susan@math.csusb.edu`). *Shears as a unifying topic through the high school and college curriculum.*

A shear is a transformation of the plane which, in some rectangular coordinate system, has equation $(x, y) \mapsto (x + ay, y)$. A shear can be illustrated with a stack of cards: push the stack sideways with a non-vertical plane. Shears are not isometries: they distort most distances and angles. They do, however, preserve area. This apparently peripheral type of transformation also underlies many topics throughout the mathematics curriculum, from high school geometry and precalculus, through multivariable calculus, linear algebra, and Lie groups. We will present a set of investigations adaptable for students at different levels of abstract thinking, from middle school to math, which will help students think transformationally and connect advanced mathematics to familiar elementary topics including area, graphing, and analytic geometry. Here is an elementary example: if a figure, such as a triangle, circle, or parabola, is drawn on the side of the stack of cards, what can you say about the sheared figure? To investigate shears and related transformations, we use the locus and plot commands in Geometer's Sketchpad and the transform command in Maple. Each has advantages and disadvantages, which we will illustrate. (Received September 15, 2000)