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**J Brooke Ernest\*** (brookeernest@gmail.com) and **Ricardo Nemirovsky**  
(nemirovsky@sciences.sdsu.edu), 6475 Alvarado Road, San Diego, CA 92120. *Intersections:*  
*Undergraduate students' engagement with projective geometry and the arts.*

We teach an undergraduate course on projective geometry in which students explore connections with art. Starting from the classic problem of linear perspective to create “realistic” images, we extend affine planes onto projective planes. Students learn to prove synthetically with axioms for  $RP^2$  and  $RP^3$ . The last section of the course reconstructs several theorems analytically through the use of homogeneous coordinates. During the course, students analyze different types of paintings and create their own paintings with airbrushing techniques. In this presentation we discuss recorded conversations with students in this course before, during, and after a field trip to a museum of contemporary art. While the historical and technical relationships between projective geometry and realistic paintings or photographic images are easy to recognize, the students’ work and analysis of contemporary art poses open-ended and non-trivial questions for them regarding more general connections between mathematics and the arts. In particular, their simultaneous engagement with projective geometry and contemporary art can lead to important insights about the expressive potential of mathematics and the cultural value of conceptual art. (Received September 26, 2012)