

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

1003-N1-438 **Tevian Dray*** (tevian@math.oregonstate.edu), Department of Mathematics, Oregon State University, Corvallis, OR 97331, and **Corinne A. Manogue** (corinne@physics.oregonstate.edu), Department of Physics, Oregon State University, Corvallis, OR 97331. *The Importance of Technology-Free Visualization Activities.*

A key ingredient in bridging the gap between mathematics and the physical sciences is an increased emphasis on geometric reasoning. We discuss here several activities we use in the classroom to develop this skill, each of which is designed to address known student misconceptions; each produces an “Aha!” reaction from many students. However, none of these activities involve technology. As Ken and Pat Heller have noted in *Cooperative Group Problem Solving: A User’s Manual* (see also <http://groups.physics.umn.edu/physed/Research/CGPS/CGPSintro.htm>), it is essential to force students to do the things they find difficult. In each of these examples, we believe forcing the students to work through the geometry themselves is essential to mastering the concepts.

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