1067-Z1-2355 **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. *Differences between Mathematicians and Physicists.*

Mathematics may be the universal language of science, but other scientists speak a different dialect. Mathematicians simply think differently from other scientists. There is nothing wrong with this, but the differences deserve explicit acknowledgment.

We report here on our very successful 15-year effort to bridge this cultural gap between lower-division mathematics and upper-division physics. To our own surprise, this gap is well described by the statement that lower-division mathematics is about algebra, whereas upper-division physics is about geometry. As evidenced by qualitative evaluation of student interviews, students who use our materials are more likely to reason geometrically than those who do not. Anecdotal evidence also suggests that these students perform at least as well on traditional questions, and do significantly better on conceptual questions. Our conclusion is that an emphasis on geometric reasoning, rather than algebraic manipulations, greatly enhances conceptual understanding. (Received September 22, 2010)