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Conversations to transform geometry class.

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Summary: Classroom culture is negotiated and established through both conversations and practices. Traditionally, teachers and researchers have focused primarily on the individual and social construction of mathematical content – that is, students’ conceptual understanding and procedural skills – through mathematical actions and practices. This article shares three explicit discussions about the nature of mathematics: (1) Mathematical Objects Exist Only in Our Minds: The authors put this question to their geometry students on the first day of class; (2) Definitions Matter to Mathematicians. They Matter a Lot!: Definitions are crucial to mathematicians. They provide a means of conveying ideal mental objects, and they give precise conditions for classifying objects and making arguments about those objects. The authors have found that students learn to value and understand definitions better if they regularly engage in cultural conversations in which they are asked to use a definition to classify a set of objects and then have the opportunity to discuss the very nature of definitions; and (3) Examples – Unless You Can Examine Them All – Do Not Make A Mathematical Proof: During the first weeks of geometry classes, the authors discuss the Euclidean geometry theorem that the sum of the angles in a triangle is a straight angle. They typically first spend ten to fifteen minutes exploring representations of various triangles. In small groups, students may cut out triangles and then fold the triangle so that the vertices of the triangles meet at a single point, or they may tear off the angles containing the vertices and arrange them so that the three angles are adjacent to one another. They may also draw several triangle representations and measure the angles with protractors. (ERIC)

Classification: D43 C53 C73 G43

Keywords: geometry; discussion; definitions; teaching methods; concept formation; geometric concepts

<http://www.nctm.org/Publications/Mathematics-Teacher/2016/Vol109/Issue7/Conversations-to-Transform-Geometry-Class/>