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In two-year colleges nationwide, the algebra sequence remains a persistent obstacle for adult learners who pursue degrees and careers in more technically demanding fields. In many cases students' unsuccessful encounters with high school algebra become a *dj vu* experience in college algebra courses. Historical evidence of student achievement confirms that the same instructional methods are ineffective for a significant percentage of community college students. In this paper we describe how the design principles of Realistic Mathematics Education (RME; Freudenthal, 1991) were used to redesign a two-week unit for exponential and logarithmic functions. Essential to RME are the curriculum design principles of progressive formalization and relating new mathematical representations, concepts, and skills to students' prior knowledge. The pilot of this unit in several community college classrooms elicited dramatic shifts in teacher practice, student access and student engagement, and resulted in improvements to the learning and understanding of mathematics for both teachers and students. Ways in which these design principles can be used to improve college algebra curricula will be discussed. (Received September 20, 2007)