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FERMAT (Fellows Engaged as Resources in Mathematics to Assist Teachers) is a project that each year places 10 graduate mathematics students in K-12 schools of Los Angeles Unified School District, Local District 1. FERMAT's focus is on pre-Algebra, Algebra I, and Geometry instruction. Consistent with the goals of the NSF GK-12 program, the project emphasizes the development of communication, teaching, and teamwork skills of participating graduate students. In its third year FERMAT Fellows are assisting 20 teachers from two high schools and six middle schools. Some of the lessons prepared by FERMAT Fellows involve notions of knot theory, non-Euclidean geometries, metric spaces, and topics of group theory. Fellows not only have implemented some activities that involve elementary aspects of advanced mathematical theories, but have conveyed the excitement of discovery and of formulating and proving a conjecture. Fellows also have increased the use of computer-based instructional materials in the participating schools. In this talk we will give examples that illustrate how Fellows have implemented such lessons and discuss the successes and difficulties in running a GK-12 project. (Received September 15, 2007)