

Making Algebra I More Accessible to All Students

*Matt Roberts, Bartholomew
Brad Branham, Bartholomew*

The goal of our presentation was to give Algebra I teachers some innovative ideas to make algebra easier for everyone. We were able to provide support to teachers by giving them new ideas for instruction strategies and techniques. These ideas will hopefully improve their chances of succeeding in their own classrooms.

The presentation began with an introduction to the *College Preparatory Mathematics* (CPM) curriculum. The goal of CPM is to provide mastery of the concept taught over time, and topics are continually reviewed. Each topic is developed by moving through concrete, representational, and abstract stages. There is a focus on the big ideas; each unit has only four or five objectives and culminates in a one major activity that incorporates the objectives. Understanding is enhanced through the use of learning theories: different learning styles are accommodated, connections are made between topics, students are expected to be doing the math and are engaged in higher cognitive levels, students work in study teams and are engaged in discussion, and student reflection is built into the curriculum.

These features were emphasized in this session through examples from two strands: writing and solving equations and multiplying and factoring polynomials. Several activities and strategies to use with students were presented. These included:

- Mental Math with Diamonds. Given the product and sum of two unknown numbers (for example, -5 and 4), students find the two numbers (-1 and 5).
- Guess and Check Tables. Given word problems, students use tables to write equations and check possible solutions.
- Fraction Busters. This strategy uses common denominators to solve equations with one variable.
- Algebra Tiles. These manipulatives give teachers and students a concrete model used to solve equations by working with area. The smaller squares represent an area that is 1 unit by 1 unit in size, rectangles represent an area that is 1 unit by x units, and larger squares represent an area that is x units by x units. The

presenters demonstrated how to use the tiles to represent multiplying binomials and factoring trinomials.

- Generic Rectangles. This is a representational tool that can be used once students have understood the concrete models (the algebra tiles). The presenters showed how to use the two-by-two grids to multiply binomials and factor trinomials.

The participants asked questions and there were lively discussions throughout the presentation. The presenters also provided a handout that included tasks to use with each of these activities, as well as a copy of one of the culminating project tasks in CPM.