

Mathematics Courses for Elementary Education Majors at Boston University

STEM Summit IV: Accelerating Forward

October 17, 2007

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Previous Math Requirements

- Mathematical Reasoning in the Elementary Grades: Number and Geometry
 - 4 credits
- Mathematical Reasoning in the Elementary Grades: Algebra, Statistics and Probability
 - 2 credits

Profile of Students

- 50+ elementary education majors per year
- Mean Combined SAT 1265
- Mean Math SAT 630
- Mean HS GPA 3.52

New Courses for Elementary Education Majors

- More credit hours
 - 8 credits — 2 courses
- Reorganization of content
 - Number, Computation and Probability
 - Algebra, Geometry and Statistics

Course Goals

- To develop pre-service teachers' deep understanding of key mathematical ideas of the elementary curriculum
- To explore children's reasoning about important ideas in mathematics

Understanding Content

- In-class Investigations and Homework
 - Which fractions terminate when represented as a decimal? Why?
 - The GCF of two numbers is 4 and the LCM is 60. One of the numbers is 20. What is the other number?
- Projects
 - Use mathematics to compare two brands of paper towels.
 - Describe the interpretations of division that are used in two different fourth grade textbooks.

Emphasis on Sense Making

Are these equations true or false? Why?

- $27 + 46 = 30 + 43$
- $83 - 17 = 86 - 20$

- $5 \times 64 = 10 \times 32$
- $98 \times 12 = 100 \times 12 - 24$



Children's Reasoning

What does this child understand based on her solution process?

Why does it work?

$$192 - 40$$

$$200 - 48$$

In Summary

- Sequence of courses for undergraduates and graduates focusing on the mathematics of the elementary grades
- One core textbook
- Supplemental materials and projects that connect the mathematics to the classroom