

Math Out of the Box®

Field and Pilot Test Trends

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Math Out of the Box has been field tested and piloted in four states: South Carolina, New Jersey, Pennsylvania, and Illinois. In these field tests and research pilots, a Math Out of the Box module has been used to replace identified standards normally taught with traditional textbooks as part of the school districts' curriculum plans. Longitudinal data is currently being collected at 16 sites.

The following trends have been observed. Much more research needs to be done with larger populations over multiple years.

- Traditional teachers who have not used collaborative grouping, a communication model in which the students share their thinking, or manipulatives to develop conceptual thinking, become frustrated about five lessons into a twenty lesson module. Teachers who continue past this initial point of frustration are able to successfully implement the module.
- Teachers who have an inquiry background do not appear to have the same initial frustrations as those with a traditional background.
- Both traditional and inquiry-based teachers have realized an immediate positive impact on student achievement.
- A trend for immediate improvement in student achievement has been observed on statewide standardized tests, locally developed benchmark tests, district adopted diagnostic tests, and Math Out of the Box assessment items.
- The teachers who successfully implement Math Out of the Box have the highest student achievement in mathematics on statewide standardized tests at their school.
- At low-performing Title I schools, a trend towards positive immediate impact on mathematics achievement on statewide standardized tests for sub-groups of students has been noted. The subgroups of subsidized lunch students and African American students show movement from below basic to meeting standard at levels that reflect a closing of the achievement gap.
- The trend to closing the achievement gap continues when a school continues to implement Math Out of the Box over several years.
- When individual teachers changed the components of the lesson, the student achievement on mathematics assessments did not show the gains of students in classrooms where the teachers followed the Math Out of the Box model. More research is needed to identify the changes that impede positive impact. Early observation data indicates a change in the questions provided in the lessons, making them lower level recall, may be impacting student achievement. Teachers have also been observed using the manipulatives as demonstration tools rather than putting them in the hands of the students as designed in the lessons.
- When Math Out of the Box is implemented without following the storyline which is organized in conceptual chunks around a big mathematical idea, when the program is used one day per week, or when lessons are separated in a way not designed in the curriculum, there appears to

be no impact on student achievement.

- Early research indicates that Math Out of the Box may positively impact the number of students scoring at the proficient level in high achieving schools. In one small study, teachers who implemented Math Out of the Box had more students scoring proficient on the statewide standardized test than the teachers in the same school who implemented the traditional textbook.
- Analysis of classroom observations of teachers and teacher reflections show a change in teaching strategies after implementing Math Out of the Box.
- Teacher reflections and interviews show that Math Out of the Box teachers have a paradigm shift in knowing how their students learn mathematics and knowing how they themselves learn mathematics.
- Preliminary analysis of teacher reflections and interviews indicate that Math Out of the Box teachers become practitioners of formative assessment techniques.
- There is a positive impact on student achievement on Math Out of the Box pre and post assessment items when the program is implemented in summer school for low achievers.