

## Research Questions

- What effect do the NJ PEMSM activities have on teachers' mathematical knowledge, especially knowledge for teaching?
- What effects of increased knowledge in mathematics can be observed in teachers' work in their own classrooms?
- What measurable gains are observed in mathematical proficiency, depth of mathematical understanding, and academic achievement by the students of participants in NJ PEMSM?
- To what extent and through what processes do the teachers exercise leadership roles in their school districts (e.g., facilitating content-based professional development)?

## Evaluation

### External assessments

Research for Better Schools (RBS) is conducting an evaluation study to ensure the effectiveness of NJ-PEMSM, measuring the extent to which the program contributes to:

- (1) increases in teachers' mathematical content knowledge and pedagogical content knowledge
- (2) the development of teachers' abilities to provide leadership within their districts
- (3) improved academic achievement in mathematics among students

### Internal assessments

NJ PEMSM regularly reviews and revises its programs and practices based on feedback from partner districts, teacher participants, staff, and an advisory board.



## The New Jersey Partnership for Excellence in Middle School Mathematics

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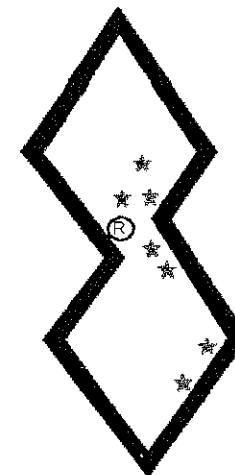
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# RUTGERS

NEW BRUNSWICK



NJ  
Partnership  
for  
Excellence in  
Middle  
School  
Mathematics

*Partner districts are  
stars in our state!*

Carteret, Long Branch, Old Bridge,  
Orange, Plainfield, Sayreville, Toms River

### Rutgers University Contributing Units

- Department of Mathematics
- Robert B. Davis Institute for Learning
- Graduate School of Education
- Center for Mathematics, Science, and Computer Education
- Office for the Promotion of Women in Science, Engineering, and Mathematics

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National Science Foundation  
WHERE DISCOVERIES BEGIN

## Goals

To prepare a cadre of mid-career middle school mathematics teachers to

- understand the mathematics of middle school more deeply
- engage their students more effectively in studying and learning mathematics
- take on leadership roles such as math coach or facilitator of in-house content-based professional development for their colleagues

## Participant Support

The NSF grant will support four cohorts of experienced teachers as they complete the NJ PEMSM Institute program, and take on peer leadership roles in their districts. Teachers admitted to the Institute will receive PEMSM Fellowships providing summer stipends and covering tuition and student fees. Each cohort consists of 25 teachers from grades 5 through 9.

## Partner Districts

The current partner districts are Carteret, Long Branch, Old Bridge, Orange, Plainfield, Sayreville, and Toms River. We invite inquiries from districts in the counties of Union, Somerset, Middlesex, and Monmouth interested in joining the partnership.

*Photo credits: Carl Blesch, Cecilia Arias*



## NJ-PEMSM Institute

The Institute provides a structured program of seven graduate courses at Rutgers University over two years: Seminar in Mathematical Ideas; Number, Operation, and Algebra; Geometry and Measurement; Motivation and Affect; Lesson Study on Mathematical Reasoning; Data and Probability; Problem Solving with Discrete Math.

The Institute also includes a series of workshops on special education in mathematics, and a series of seminars on teacher leadership. As space permits, the workshops on special education in mathematics will be open to all teachers in the partner districts.



## Expected Benefits

### For Teachers

- Seven masters-level courses at Rutgers University. Tuition and fees are waived
- Stipends for successful completion of each Summer Institute
- Courses can be applied to a M. Ed. in Math Ed. (contingent on admission to GSE)
- The content courses satisfy requirements for a Middle School Math Specialization Endorsement

### For Students

- More mathematically meaningful, engaging instruction to improve computational fluency and conceptual understanding of mathematics
- A supportive learning environment that facilitates the development of confidence and competence in mathematics
- Motivation and self-confidence to engage with increasingly challenging curricula – especially the introduction of algebraic reasoning and the transition to more formal algebra

### For New Jersey

- Student proficiency in mathematics leading to increased opportunities, a more productive workforce, and a more prosperous economy
- An increased ability for NJ residents to understand the mathematics we all face in our daily lives

- *Italic is Debbie Ford's response.*
- *Bold type is for emphasis.*

*Partnership for Excellence in Middle School Mathematics (PEMSM)*

District's formal commitments upon joining the NJ PEMS M:

1. Generate applications from appropriate teachers to become Partnership Fellows (2 to 4 per year) **5 teachers have already declared interest, and there are 2 teachers who attended the information session and are ready to apply.**
2. Name a District Liaison to facilitate communication between the District and the Partnership
3. Name a member of the NJ PEMS M Advisory Committee **I have offered to serve as both liaison and member of the advisory panel**
4. Provide data as required by the project's external evaluators, subject to the following conditions:
  - a. Teacher names and student names will be replaced by code numbers.
  - b. No evaluation documents will provide data in a way that identifies individual students, teachers, schools or districts.**
5. Provide access to classrooms and teachers for research and/or evaluation, subject to the following conditions:
  - a. Any such research and evaluation will conform to IRB rules and any such access will follow District procedures.**
  - b. Research reports will not identify any student, teacher, school, or district.**
6. Provide opportunities and appropriate support (e.g., scheduling rooms and times, release time, mentoring, extra pay for afterschool PD efforts) for Partnership Fellows to serve as teacher leaders, for example as
  - a. math coach or teacher peer mentor
  - b. in-house leader for content-based professional development
  - c. facilitator of mathematics lesson-study groups
  - d. facilitator of professional learning communities**These opportunities for mentoring, providing in-house professional development and facilitating PLC's already exist in the district.**

Teachers get 7 courses for free. The courses are applied to their Masters degree in Mid Sch Math. The teachers are paid by the grant to attend the courses in the summer.

### New Jersey Partnership for Excellence in Middle School Mathematics

#### Academic Calendar for Cohort 3

- September 2011 Distribute recruitment information to Partner Districts Liaisons
- October 2011 Review applications by teachers to become Partnership Fellows (PF's)
- November 2011 Acceptance decisions
- December 2011 New Partnership Fellows apply to Rutgers Graduate School of Education  
Most apply for non-matriculated status (i.e., not as degree candidates)
- January 2012 Seminar on Mathematical Ideas (Semester starts Tuesday January 17.)  
14 weeks; tentatively Tuesdays 5-8pm; on campus, room to be announced  
Class ends in early May
- Summer 2012 Summer Institute #1:  
Number Operation and Algebra;  
Geometry and Measurement  
Classes 5 days a week on campus, tentatively July 9 - August 3  
Interested PF's may apply for masters or doctoral programs.
- Fall 2012 Lesson Study on Mathematical Reasoning  
Hybrid course (2 days on campus, much on-line, some meetings by region)
- Spring 2013 Motivation and Affect in Math Classrooms  
Tentatively a hybrid course (5 days on campus, much on-line)
- Summer 2013 Summer Institute #2  
Problem Solving with Discrete Mathematics;  
Data and Probability  
Classes 5 days a week on campus, tentatively July 8 - August 2

#### Additional activities during the 2<sup>nd</sup> year of Cohort 3

- Three workshops on special education in mathematics: delivered in each District, topics and schedule to be arranged in consultation with the District, required of PF's, open on a space-available basis to all mathematics and special education teachers.