Milwaukee Mathematics Partnership High School Labs

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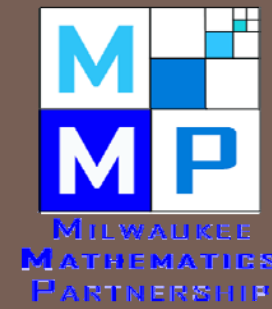
Professional Development to Deepen Teacher Content Knowledge
Lessons from the NSF Math and Science Partnerships
Washington, DC
May 24, 2010



Session Goals

- We Are Learning To…

Understand the motivations, format and typical content of the MMP High School labs

- We will know we are successful when…

We can see how to adopt this format to working with our own teachers.

Why High School Labs?

- To familiarize teachers with the approach to mathematical content and pedagogy in the new district textbook series.
- To provide a forum for teacher discussion around students' understandings, preconceptions and misconceptions.
- To build communities of classroom teachers of algebra and geometry, and enhance teacher collaboration focused around teaching and learning.

High School Lab Format

- Morning session (3 hours)
  - Model lesson
  - Discussion of content and pedagogy in model lesson
- Afternoon session (3 hours)
  - Collaborative lesson planning
- All labs are prepared and facilitated by a "design team" consisting of a mathematician, a mathematics educator, and a classroom teacher.

Sample Content: Exponential Growth

- Data collection (Growing M&Ms)
- Representation and discussion of data using graphing calculators (tables and statplots): what type of function would best model this data?
- Modeling data by curve fitting: $y = b^x$, then $y = ab^x$.
- *Discussion: does this model make sense?*
- *Inverse problem; logarithms*

Lesson Planning Tools

- Lesson Planning with Formative Assessment Template (WALT)
- Launch, Explore, Summarize, Apply lesson plan template (LESA)

Lesson Planning With Formative Assessment Template

Part 1: Selecting and Setting Up a Mathematical Task This part contains four critical components that need to be considered when selecting and setting up a mathematical task.	Part 2: Supporting Student Exploration of the Task In this sections, construct three questions that will develop the mathematics of the lesson. Be sure to consider the Depth of Knowledge to develop the questions. These questions could be used with students individually or in small groups.	Part 3: Summarizing the Mathematics In this section, construct a question that focuses on orchestrating a whole group discussion of the task that uses different solution strategies produced by the students that highlight the mathematics of the lesson.
1. Important Mathematics to Develop: **2. Learning Target & Descriptors:** **3. Lesson Objective in Student Friendly Language:** **4. Success Criteria:**	**Q1. Access background knowledge:** **Q2. Develop understanding of the mathematics by pushing student reasoning:** **Q3. Summarize the important mathematics in the lesson. This should tie back to the success criteria.**	**Q. Summarize the important mathematics in the lesson as a whole class discussion. This should tie back to the success criteria.**

Successes

- Approximately 1/3 of MPS teachers of Algebra I and Geometry have attended labs over the last 2 years.
- Teachers report being more comfortable with the new textbooks, and with use of technology.
- Some lab attendees appear to be modifying their classroom practice.

Successes

The MMP has influenced teaching in math classrooms in several ways. Several teachers have attended labs and Saturday academies and brought back new information to the math department. I have seen effective strategies from these used directly in the classroom and have heard and taken part in discussions about maintaining or improving the use of these.

- High School MTL

Challenges

- Teachers find it challenging to identify the "Big Ideas" in a lesson, and to write good Learning Intentions and Success Criteria
- While teachers enjoy the mathematics content and presentation for themselves, too few are applying what they see in their own classrooms.
- How do we reach the next set of teachers?

Future plans

- Deepen study of content and practice for regular attendees of the last 2 years' labs.
- Hold labs in high school buildings, and have Mathematics Teacher Leaders teach model lessons, in order to reach the next 1/3 of district teachers.

Thank you.

MMP website

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MILWAUKEE MATHEMATICS PARTNERSHIP

This material is based upon work supported by the National Science Foundation Grant No. 0314898.