Math Out of the Box
Professional Development
2009-2010

Following are descriptions of Math Out of the Box (MOOTB) institutes and workshops. The MOOTB research team in the Department of Mathematical Sciences at Clemson University has designed and delivered high quality professional development to support the MOOTB curriculum in the Beginning, On-going, and Refining implementation phases. Professional development services are fee based.

Contact Dot Moss at 864-885-2378 or 864-656-1716 (dmoss@clemson.edu) for more information, or to contract for institutes and workshops. (For more information, visit mathoutofthebox.org)

1. Beginning Professional Development

Beginning Professional Development for Math Out of the Box provides inquiry-based sessions that are essential for instructional leaders and classroom teachers to begin the implementation of student-centered mathematics. These sessions include the following:

Strand-Based
Train the Trainer Institutes

These institutes are designed for instructional leaders, coaches, and lead teachers (up to 40 participants) in school districts that are beginning the implementation of a strand of the Math Out of the Box curriculum. The participants receive a Vertical Professional Development Facilitator Guide and PowerPoint to enable them to provide professional development in their schools or districts. The following institutes can be completed individually prior to the implementation of each Math Out of the Box strand, or consecutively in a week-long institute.

- **Train the Trainer: Developing Number Concepts (3 Days)**
- **Train the Trainer: Developing Algebraic Thinking (2 Days)**
- **Train the Trainer: Developing Geometric Logic (2 Days)**
- **Train the Trainer: Developing Measurement Benchmarks (2 Days)**
- **Train the Trainer: All Strands (5 days, not concurrent)**

One-Day Overview
All Strands

This professional development session is planned as a school-wide introduction to the research-base and content of the strands of Math Out of the Box.

Vertical Professional Development

This professional development for new users (up to 40) provides standards-based vertical articulation of a strand of Math Out of the Box. Participants experience hands-on investigations, which are designed to make mathematical connections from kindergarten to fifth grade. Essential components of inquiry-based instruction are modeled. Each one-day Vertical Professional Development session can be divided into half days or after school sessions.

- **Vertical Professional Development (K-5): Developing Number Concepts**
- **Vertical Professional Development (K-5): Developing Algebraic Thinking**
- **Vertical Professional Development (K-5): Developing Geometric Logic**
- **Vertical Professional Development (K-5): Developing Measurement Benchmarks**

Early Childhood
Grades K-2

This standards-based professional development for new users (up to 60) provides one-day sessions which focus on the vertical articulation of a strand of Math Out of the Box from kindergarten to second grade. An emphasis is placed on the role of mathematics in the cognitive, social, and physical development of students at the early childhood level. The following list of sessions can be provided separately, or in a four-day sequence.

- **Early Childhood Grades K-2: Developing Number Concepts**
- **Early Childhood Grades K-2: Developing Algebraic Thinking**
- **Early Childhood Grades K-2: Developing Geometric Logic**
- **Early Childhood Grades K-2: Developing Measurement Benchmarks**

Elementary
Grades 3-5

This standards-based professional development for new users (up to 60) provides one-day sessions which focus on the vertical articulation of a strand of Math Out of the Box from third to fifth grade. An emphasis is placed on the role of mathematics in the cognitive, social, and physical development of students at the elementary level. The following list of sessions can be provided separately, or in a four-day sequence.

- **Elementary Grades 3-5: Developing Number Concepts**
- **Elementary Grades 3-5: Developing Algebraic Thinking**
- **Elementary Grades 3-5: Developing Geometric Logic**
- **Elementary Grades 3-5: Developing Measurement Benchmarks**

2. On-Going Professional Development

On-Going Professional Development for Math Out of the Box provides inquiry-based sessions for educators who are extending their implementation of the curriculum. These sessions include the following:

Module Specific Professional Development

These one-day workshops are designed to provide a comprehensive overview of any module at an individual grade-level. Workshops are designed for up to 40 participants. During these workshops, emphasis is placed on the following: Research-based strategies to construct and strengthen teachers' content knowledge, hands-on investigations into math content in each subconcept, strategies for grade-level teams to effectively plan together for mathematics instruction, formative and summative assessment embedded in the curriculum, correlation of lessons to mathematics content and process standards, and connections to other math concepts and curriculum areas.

- **One Grade Level Module from Developing Number Concepts**
- **One Grade Level Module, Developing Algebraic Thinking**
- **One Grade Level Module, Developing Geometric Logic**
- **One Grade Level Module, Developing Measurement Benchmarks**

Train the Trainer Institutes
Grade Level Module Specific Training

These institutes are designed for instructional leaders, coaches, and lead teachers in school districts which are continuing to implement the Math Out of the Box curriculum. In these institutes, participants focus on the development of concepts at individual grade levels. Participants will experience hands-on activities, investigate correlations between grade level modules and state standards, and examine subconcepts in-depth at each grade level. The participants receive a facilitator guide and PowerPoint that enable them to provide Module Specific Professional Development in their school and/or district. The following list of institutes can be completed individually prior to the implementation of each Math Out of the Box strand or can be completed consecutively in a week-long institute.

- **Train the Trainer: Grade Level Module, Developing Number Concepts (2 Days)**
- **Train the Trainer: Grade Level Module, Developing Algebraic Thinking (1 Day)**
- **Train the Trainer: Grade Level Module, Developing Geometric Logic (1 Day)**
- **Train the Trainer: Grade Level Module, Developing Measurement Benchmarks (1 Day)**

Leadership Institutes

Administrative Support for Inquiry Mathematics is a two-day session designed for those in administrative positions who support teachers while implementing Math Out of the Box. An emphasis is placed on working collaboratively to create a systemic plan for implementation that is effective and manageable.

Effective Coaching for Inquiry Mathematics is a two-day session designed for instructional leaders including math coaches who support teachers working with Math Out of the Box. Participants work to develop strategies for creating a mathematics teaching community in their schools. The session emphasizes increasing mathematical content knowledge of teachers, supporting change in teaching strategies , and developing an understanding of the role of a coach in increasing teacher quality and student achievement.

Content Workshops

Content Workshops are designed for teachers, curriculum leaders, or parents seeking to increase content knowledge to support student reasoning in mathematics. Participants are immersed in hands-on experiences relating to specific content areas. Workshops emphasize developing conceptual and procedural understanding, connecting content knowledge to instructional practice, and clarifying misconceptions related to mathematics. The workshops are designed to be flexible in length (workshops, mini-conferences, summer institutes) depending on the unique needs of schools and districts. Content Workshops include topics such as the following:

Grades K–2

Algebra/Data Analysis	Geometry	Measurement	Numbers and Operations
Algebraic Patterns Simple Graphs	Describing 2-D Shapes Describing 3-D Shapes	Attributes of Length Counting Money	Counting Skills Describing Place-Value Patterns Fluency with Addition and Subtraction Facts Addition Strategies Subtraction Strategies

Grades 3–5

Patterns, Relationships, and Functions Categorical and Numerical Data Investigating Probability Discovering Discrete Mathematics	Analyzing 2-D Shapes Analyzing 3-D Shapes	Focusing on the Metric System Focusing on the Customary System	Analyzing Place-Value Patterns Fluency with Multiplication and Division Facts Representing Multiplication Strategies for Division Fractions on a Number Line Decimals and Percents Greatest Common Factors and Least Common Multiples

Pedagogical Workshops

Pedagogical Workshops are designed to meet school and district challenges as classroom practice changes from traditional delivery of mathematics to inquiry-based learning communities. The workshops are designed to be flexible in length (workshops, mini-conferences, summer institutes) depending on the unique needs of schools and districts. Pedagogical Workshops include topics such as the following:

- **Assessment in an Inquiry Setting**
- **Reflective Teaching in an Inquiry Setting**
- **Mathematics Notebooking**
- **Using Technology Effectively in an Inquiry-Setting**
- **Teaching Through Inquiry**
- **Inquiry Mathematics in an Inclusive Setting**
- **Inquiry Mathematics and the Special Education Classroom**
- **An Effective Communication Model for Closing Achievement Gaps**
- **Making Mathematical Connections Across the Curriculum**

3. Refining Professional Development

Refining Professional Development is designed to match unique needs of schools and districts depending on their experiences with inquiry-based teaching and learning and their cultural influences. These research-based sessions represent professional development that is essential for sustaining ongoing instruction in student-centered mathematics.

Co-Teaching

Co-Teaching sessions are designed for classroom teachers and coaches who are novice to experienced implementers of a strand of the Math Out of the Box curriculum. The sessions provide classroom observation models, model lessons, and opportunities for reflection to grade-level teams and individuals.

- **Reflective Classroom Observations**
- **Model Lessons**
- **Reflections With Classroom Teachers**
- **Reflections With Coaches**
- **Co-Teaching With Inquiry-Based Mathematics**

Team Planning

These sessions promote grade-level and vertical team planning within schools which plan to or currently implement the Math Out of the Box curriculum.

- **Strategic Planning for Grade Level Teams**
- **Coaching Grade Level Teams**

- **Working Together in Grade Level Teams**
- **Research Experiences for Grade Level Teams**

Involving Parents

These sessions provide research on best practices, hands-on content knowledge experiences, and homework help to parents and community members. They also aid schools in planning parental involvement with mathematics education.

- **Strategic Planning for Parental Involvement**
- **Concepts and Skills in Elementary School Mathematics**
- **Homework Help**
- **They Didn't Teach Math This Way When I Was In School**

Formative Assessment

Formative Assessment Sessions are planned for experienced practitioners of inquiry-based instruction.

- **Using Assessment to Plan for Instruction**
- **Examining Student Work**
- **Using Data to Inform Decisions**
- **How Do I Get Grades?**
- **Designing Rubrics**
- **Collecting and Analyzing Anecdotal Records**
- **Analyzing Student Writing**