

Professional Development for Integrated Inquiry 2009-2010

Following are descriptions of professional development institutes and workshops developed by the Professional Development for Integrated Inquiry research team in the Department of Mathematical Sciences at Clemson University. These institutes and workshops support districts and schools that aim to improve mathematics and science achievement and are designed to improve teacher content knowledge and instructional practices regardless of the curriculum currently in use. Professional development services are fee based.

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Mathematics Content Workshops Grades K–5

Mathematics 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
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Science Content Workshops Grades K–8

Science Content Workshops are designed for teachers, curriculum leaders, or parents seeking to increase content knowledge to support student reasoning in science. Participants are immersed in hands-on experiences relating to specific content areas. Workshops emphasize developing conceptual understanding, connecting content knowledge to instructional practice, and clarifying misconceptions related to science. 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 professional development on inquiry science kits for grades K–8.

Pedagogical Workshops

Pedagogical Workshops are designed to meet school and district challenges as classroom practice changes from traditional delivery of mathematics or science 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**
- **Science 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**
- **Connecting Science and Mathematics Through Data Analysis**

Vertical Professional Development

This professional development for up to 40 teachers provides standards-based vertical articulation of the National Council of Teachers of Mathematics (NCTM) strands and state standards. 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): Number and Operations**
- **Vertical Professional Development (K-5): Algebra**
- **Vertical Professional Development (K-5): Geometry**
- **Vertical Professional Development (K-5): Measurement**
- **Vertical Professional Development (K-5): Data Analysis and Probability**

Early Childhood Grades K-2

This standards-based professional development for up to 60 teachers provides one-day sessions which focus on the standards-based vertical articulation of the National Council of Teachers of Mathematics (NCTM) strands and state standards 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.

- **Vertical Professional Development (K-2): Number and Operations**
- **Vertical Professional Development (K-2): Algebra**
- **Vertical Professional Development (K-2): Geometry**
- **Vertical Professional Development (K-2): Measurement**
- **Vertical Professional Development (K-2): Data Analysis and Probability**

Elementary Grades 3-5

This standards-based professional development for up to 60 teachers provides one-day sessions which focus on the vertical articulation of the National Council of Teachers of Mathematics (NCTM) strands and state standards 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.

- **Vertical Professional Development (3-5): Number and Operations**
- **Vertical Professional Development (3-5): Algebra**
- **Vertical Professional Development (3-5): Geometry**
- **Vertical Professional Development (3-5): Measurement**
- **Vertical Professional Development (3-5): Data Analysis and Probability**

Mathematics and Science Co-Teaching

Co-Teaching sessions are designed for classroom teachers and coaches who are novice implementers of a strand of inquiry mathematics. 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**

Mathematics and Science Team Planning

These sessions promote grade-level and vertical team planning within schools that plan to, or currently, implement inquiry-based mathematics instruction.

- **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 and science education.

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

Mathematics and Science Formative Assessment

Formative Assessment Sessions are planned for experienced practitioners of inquiry-based mathematics 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**