

**Master of Science in Teaching Specialization in
Middle School Mathematics Education**

**Assessment #4:
Observing a Problem-Solving Activity Implementation
in Middle School Mathematics**

**MATH 509: Methods of Instruction in the Middle
School Mathematics Curriculum (Grades 5-8)
OR/ MATH 612: The Learning and Teaching of
Mathematics, Grades 6-9**

**Observation of Team-Teaching a
Problem-Solving Lesson**

and

Program Standards and Performance Indicators

Assessment #4

Observing a Problem-Solving Activity Implementation in Middle School Mathematics

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Observation of Team-Teaching a Problem-Solving Lesson

MATH 509, MATH 612, MATH 613, MATH 614

The instructional problem-solving activity should be related to the middle school mathematics curriculum in such as *Connected Mathematics*. The focus of the lesson/activity is on students' mathematical thinking with respect to one of the following: algebraic thinking including number patterns; rational number understanding; geometric thinking, measurement, and spatial reasoning; and data analyses and probabilistic reasoning.

Consider the NCTM *Principles and Standards* (2000) and *Mathematics Teaching Today* (2007) throughout the implementation of your lesson:

- Organization
- Style of instruction/mathematical validity
- Focusing on students' mathematical reasoning and sense-making
- Focusing on making mathematics exciting and interesting
- Focusing on students' non-routine problem-solving strategies
- Engaging students in communication
- Engaging students in using manipulatives/technology
- Engaging students in using, and in connecting multiple representations of the embedded mathematics
- Middle-school-students friendly handouts

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Observation of Team-Teaching a Problem-Solving Lesson: Performance Indicators
MATH 509, MATH 612, MATH 613, MATH 614

Style of instruction/mathematical validity

- Effective teaching

Focusing on students' mathematical reasoning & sense-making

- Develop and evaluate mathematical arguments and proofs
- Commitment to learning with understanding
- Uses multiple strategies, including listening to and understanding the ways students think about mathematics, to assess students' mathematical knowledge

Focusing on making mathematics exciting and interesting

- Use of stimulating curricula

Focusing on students' non-routine problem-solving strategies

- Monitor and reflect on the process of mathematical problem solving
- Demonstrates the ability to lead classes in mathematical problem solving and in developing in-depth conceptual understanding, and to help students develop and test generalizations

Engaging students in communication

- Analyze and evaluate the mathematical thinking and strategies of others

Engaging students in using manipulatives/technology

- Use knowledge of mathematics to select and use appropriate technological tools, such as but not limited to, spreadsheets, dynamic graphing tools, computer algebra systems, dynamic statistical packages, graphing calculators, data-collection devices, and presentation software
- Use of various teaching tools including technology
- Selects and uses appropriate concrete materials for learning mathematics
- Demonstrates the ability to lead classes in mathematical problem solving and in developing in-depth conceptual understanding, and to help students develop and test generalizations

Engaging students in using, and in connecting multiple representations of the embedded mathematics

- Recognize and use connections among mathematical ideas
- Create and use representations to organize, record, and communicate mathematical ideas

Middle-school-students friendly handouts

- Use of various teaching tools including technology