**MLA Annotated Bibliography**

**Resources From Summer Workshop**

Casa, T. M. (2013). Capturing Thinking on the Talk Frame. *Teaching Children Mathematics, 19*(8).

Friel, S. & Markworth, K. (2009). A Framework for Analyzing Geometric Pattern Tasks. *Math Teaching in the Middle School,* *15*(1) 24 – 33.

Smith, M. (2004). Beyond Presenting Good Problems: How a Japanese Teacher Implements and Mathematics Task. In R. Rubenstein (Ed.)  *Perspective on Teaching Mathematics, NCTM 66th Yearbook (*pp 96- 106). Reston, VA: National Council of Teachers of Mathematics.

Smith, M.S., E. K. Hughes, R.A. Engle, & M. K. Stein. (2009) Orchestrating discussions. *Mathematics Teaching in the Middle School* 14(9). 549-556.

Smith, M. S., & M. K. Stein (2011). *5 Practices for Orchestrating Productive Mathematics Discussions*. Reston, VA: National Council of Teachers of Mathematics.

Williams, M. M. & T. M. Casa (2012). Connecting Class Talk with Individual Student Writing. *Teaching Children Mathematics.* 314-321.

**Algebraic Reasoning**

Caglayan, G. (2013). Prospective mathematics teachers’ sense making of polynomial multiplication and factorization modeled with algebra tiles. *Mathematics Teacher, 16,* 349-378.

D’Ambrosio, B., Kastberg, S. & dos Santos, J. (2010). Learning from student approaches to algebraic proofs. *Mathematics Teacher, 103*, 489-495.

Student responses to an algebraic proof on a NAEP item are analyzed and discussed. Possible explanations for student errors are provided, as well as suggestions for improving classroom instruction.

Darley, J. (2009). Traveling from arithmetic to algebra. *Mathematics teaching in the middle school, 14,* 458-464.

Number lines can help students to ‘bridge the gap’ between algebra and arithmetic. Students compare normal number lines with algebra number lines (e.g. 1 to x instead of 1 to 4) to help them to better conceptual algebraic expressions.

Faulkenberry, E. & Faulkenberry, T. (2010). Transforming the way we teach function transformations. *Mathematics Teacher*, *104*, 29-33.

The article discusses how using transparencies can help students to develop a better conceptual understanding of function transformations.

Matteson, S. (2010). Problems with nth-term problems: Reflect and discuss. *Mathematics Teaching in the Middle School, 16,* 88-94.

Researchers explored students’ responses to an nth term question on a standardized assessment. Student misconceptions and errors are discussed.

Rivera, F.D. & Becker, J. (2009). Algebraic reasoning through patterns. *Mathematics Teaching in the Middle School, 15,* 212-221.

The article discusses middle school students’ responses to various “patterning” problems and what those responses indicate about the students’ algebraic understanding.

**Proportional Reasoning**

Burger, L. (2010). Teaching proportional reasoning through familiar biology. *Mathematics Teacher, 104,* 186-191.

Biology has many connections to proportional reasoning. Introducing proportional reasoning in the context of real world scenarios (e.g. comparing the SA and Volume of common breeds of dogs, exploring the possibility of the existence of giants) may engage students and help students to develop a greater interest in proportional reasoning.

Che, S. (2009). Giant pencils: Developing proportional reasoning. *Mathematics teaching in the middle school, 14,* 404-408.

A teacher discusses a proportional reasoning problem that she did with her algebra students on the first day of school. The teacher created “giant pencils” and then asked the students to determine the height, weight, etc. of a giant who used that pencil. The teacher discusses faulty student reasoning and other aspects of the lesson.

Ercole, L., Frantz, M. & Ashline, G. Multiple ways to solve a proportion. *Mathematics Teaching in the Middle School, 16,* 482-490.

Students may take many approaches to solving a proportion problem. Various methods are discussed and include equivalent fractions, building up, graphing and cross multiplication.

Herron-Thorpe, F., Olson, J. & Davis, D. (2010). Shrinking your class. *Mathematics Teaching in the Middle School, 15,* 386-391.

The article describes an activity where students measured the dimensions of toys (e.g. Barbies, trucks) to determine scaling ratios. The students then used what they had learned to create scaled models of themselves and of their environment.

Marnolo, A., Sinclair, M., & Whiteley, W. (2011). Proportional reasoning with a pyramid. *Mathematics Teaching in the Middle School, 16*, 544-551.

The article describes two activities that may be used to help students to better conceptualize proportional reasoning. The first activity has students fill plastic pyramids with water and then observe the shapes that are created in the water surface. The second activity has students experiment with dilations in Geometer’s Sketchpad. Directions for executing both activities are provided.

Orrill, C. & Brown, R. (2012)Making sense of double number lines in professional development: exploring teachers’ understandings of proportional relationships. *Mathematics Teacher*, *15*, 381-403.

Otten, S., Herbel-Eisenmann, B. & Males, L. (2010). Proof in algebra: Reasoning beyond examples. *Mathematics Teacher*, *103*, 514-518.

The article discusses a pre-algebra classroom experience where students and the teacher work together to “prove” why cross-multiplication can be used to show that fractions are equivalent.

**Academic Language**

Brown, C., Cady, J.A., Taylor, P.M. (2009). Problem solving and the English language learner. *Mathematics Teaching in the Middle School, 14,* 532-539.

The authors discuss challenges faced by ELL students, as well as pedagogical strategies that may be used to help the students to overcome those challenges.

Gay, A.S. (2008). Helping teachers connect vocabulary and conceptual understanding. *Mathematics Teacher, 102,*218-224.

A focus on mathematics vocabulary must be part of teachers' instructional plans to develop students' understanding of key ideas. The authors present examples from work with pre-service teachers regarding two vocabulary strategies and other related activities that can be used by middle and high school mathematics teachers.

Hoffert, S. (2009). Mathematics: The universal language? *Mathematics Teacher, 103,* 130-139.

A teacher discusses strategies that she has used to help ELL students in her mathematics classroom.

Swanson, P. (2010). The intersection of language and mathematics. *Mathematics Teaching in the Middle School*, *15,* 516-523.

A teacher describes how she used models and manipulatives to help the students in her primarily ELL classroom with word problems and other mathematical concepts.

Tobias, J. (2013). Prospective elementary teachers’ development of fraction language for defining the whole. *Mathematics Teacher, 16,* 85-103.

**Justification (discussion)**

Bell, C. (2011). Proofs without words: A visual application of reasoning and proof. *Mathematics Teacher, 104*, 690-695.

Proofs without words are mathematical drawings that illustrate the proof of a mathematical statement. Students can be presented with a proof without words and then be asked to write a formal proof to support the proof without words.

Bleiler, S., Thompson, D., & Krajcevski, M. (2014). Providing written feedback on students’ mathematical arguments: proof validations of prospective secondary mathematics teachers. *Mathematics Teacher, 17,* 105-127.

Cavey, L. & Mahavier, T. (2010). Seeing the potential in students’ questions. *Mathematics Teacher, 104,* 133-137.

Student questions provide important opportunities for developing students’ mathematical understandings. On the website, “MathNerds Mentoring Network,” (http://mmn.mathnerds.org), prospective teachers respond to student questions. These responses can be discussed and further developed during class discussions. In this article, two sample student questions about slope are discussed.

Fukawa-Connelly, T. & Buck, S. (2010). Using portfolio assignments to assess students’ mathematical thinking. *Mathematics Teacher, 103,* 649-654.

Prospect Hill Academy in Cambridge, Massachusetts requires students to regularly complete portfolios that demonstrate what they are learning. These portfolios help the students to develop better reasoning and justification skills and also allow teachers to better assess students’ conceptual understanding.

Hackbarth, A. & Wilsman, M. (2008). 1P + 4R = 5D: An equation for deepening mathematical understanding. *Mathematics Teaching in the Middle School, 14,* 122-126.

The authors discuss how they use the 1P+4R=5D model to guide mathematics discussions. The model says that students start by looking at 1 Problem and then are presented with 4 representations of the problem. This results in 5 discussions, each one about a different aspect of mathematical understanding/misunderstanding.

Hoffman, B., Breyfogle, M. & Dressler, J. (2009). The power of incorrect answers. *Mathematics Teaching in the Middle School, 15,* 232-238.

This article uses the Math Talk Learning Community Framework (Hufferd-Ackles, Fuson, and Sherin, 2004) to analyze different classroom episodes. Following an analysis of the classroom episodes, alternative pedagogical strategies are offered and discussed.

Koellner, K., Pittman, M. & Frykholm, J. (2008). Talking generally or generally talking in an algebra classroom. *Mathematics Teaching in the Middle School, 14,* 304-310.

This article focuses on the ways in which four eighth-grade girls, each with varying levels of algebraic understanding, share ideas, debate, and gradually move toward generalizations inherent in the “Painted Cube” problem. The article examines how students move to progressive formalization and to provide insights into the ways that teachers can foster similar processes among their students.

Mueller, M. & Maher C. (2009). Convincing and justifying through reasoning. *Mathematics Teaching in the Middle School, 15,* 108-116.

The article discusses student justification and reasoning. The discussion is centered around an activity in which students use Cuisenaire rods to explore fractions. Student responses are discussed in the context of various justification and reasoning methods.

Norton, A., Rutledge, Z., Hall, K. & Norton, R. (2009). Mathematical letter writing. *Mathematics Teacher, 103*, 340-346.

High school Algebra 2 students and pre-service teachers communicated about mathematical problems through weekly letters. The process for setting up the letter writing activity is described as well as the outcomes of the activity. Students noted that the letter writing activity helped them to improve their ability to problem solve and to communicate their mathematical reasoning.

Vazquez, L. (2008). A,E,I,O,U and always Y: A simple technique for improving communication and assessment in the mathematics classroom. *Mathematics Teacher, 102,* 16-23.

The A,E,I,O,U method provides students a framework for structuring mathematical responses. Students are assessed using a rubric and are allowed the opportunity to revise work after receiving their scores.