

Karen C. Fuson (2013, April). *Continual Formative Assessment Using the Common Core Mathematical Practices*. Presented at the Annual Meeting of the NCTM, Denver, CO.

Table 2 The Solve, Explain, Question, and Justify Classroom Structure

Step 1 Solve:	All students solve.
Step 2 Explain:	One student explains and then asks, “Are there any questions?”
Step 3 Question:	Other students ask questions to clarify or extend.
Step 4 Justify:	The original explainer responds to the questions by explaining more (justifying the original explanation).

Notes. Any student at any time can ask for help from anyone. Typically another student explains, so the class loops through 2, 3, and 4 again. The discussion can now also contrast and compare the first and second solutions as well as others in the past. Explaining can be done in the whole class or in small groups so that more students have a chance to explain. Both versions have advantages. This can be called Solve and Discuss for short.

Table 3 The Responsive Means of Assistance that facilitate learning and teaching by all

A. Engage and Involve		
B. Manage		
C. Coach:	a. Show/explain	b. Focus and extend
	a1. model	b1. clarify
	a2. instruct/explain	b2. question
		b3. give feedback

Notes. Students and teachers do all of these responsive means of assistance. These categories were based on categories used in reading by Tharp and Gallimore (1988) and are discussed in Fuson and Murata (2007).

These tables are from Hufferd-Ackles, K., Fuson, K. C., & Sherin, M. (expected Nov 2013). Describing levels and components of a Math-Talk Learning Community. An edited version will appear in E. A. Silver & P. A. Kenney (Eds.), *Lessons Learned from Research: Volume 1: Useful and Useable Research Related to Core Mathematical Practices*. Reston, VA: NCTM.

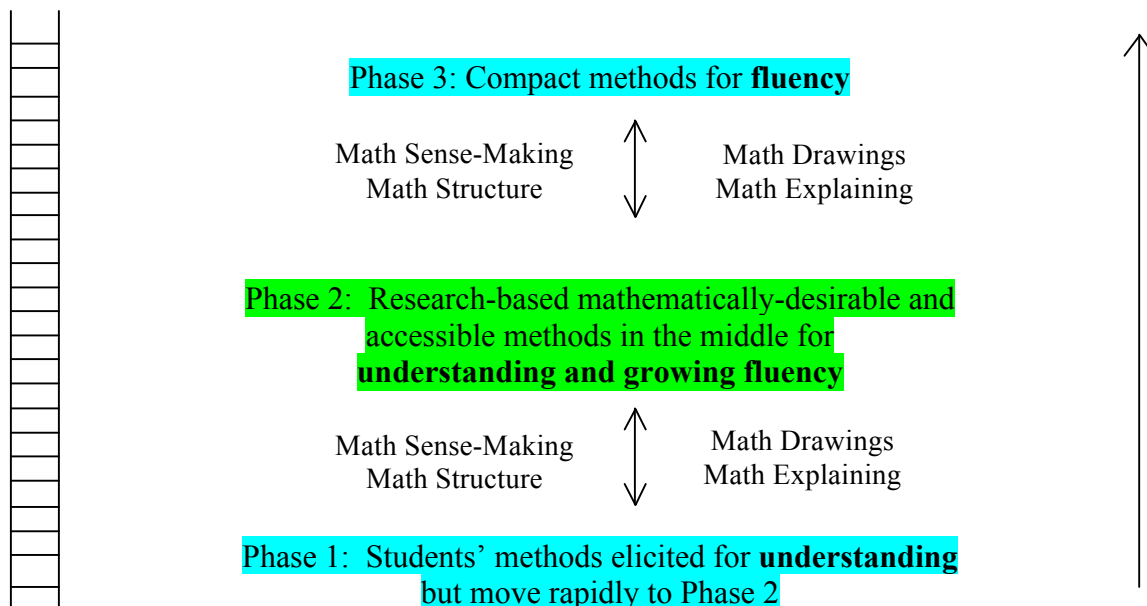
To receive a current version of the above short article for teachers and/or the article below that I wrote with some of my teachers, email Karen Fuson at karenfuson@mac.com. Please put NCTM MT in the subject so I know to read that email. Then tell me which articles you would like to receive. You can also ask for a copy of both pages of this handout.

Fuson, K. C., Adler, T., Roedel, S., & Zaccariello, J. (2009). Building a nurturing, visual, Math-Talk teaching-learning community to support learning by English Language Learners and students from backgrounds of poverty. *New England Mathematics Journal*, (May) *XLI*, 6-16.

Learning Path Teaching-Learning: Differentiating within Whole-Class Instruction by Using the Math Talk Community

Bridging for teachers and students
by coherent learning supports

Learning
Path



Common Core Mathematical Practices

Math Sense-Making about Math Structure using Math Drawings to support Math Explaining

Math Sense-Making: Making sense and using appropriate precision

- 1 Make sense of problems and persevere in solving them.
- 6 Attend to precision.

Math Structure: Seeing structure and generalizing

- 7 Look for and make use of structure.
- 8 Look for and express regularity in repeated reasoning.

Math Drawings: Modeling and using tools

- 4 Model with mathematics.
- 5 Use appropriate tools strategically.

Math Explaining: Reasoning and explaining

- 2 Reason abstractly and quantitatively.
- 3 Construct viable arguments and critique the reasoning of others.

The top is an extension of Fuson, K. C. & Murata, A. (2007). Integrating NRC principles and the NCTM Process Standards to form a Class Learning Path Model that individualizes within whole-class activities. National Council of Supervisors of Mathematics Journal of Mathematics Education Leadership, 10 (1), 72-91. It is a summary of several National Research Council Reports.