Mathematics Monthly (K-5)

OCTOBER 2012

Welcome to Mathematics Monthly where you'll find a variety of suggestions and resources to help you teach mathematics in grades K-5. I did hesitate a bit to use the word *monthly* in the title as it puts a bit of pressure on me to get this out, but that is my goal—to get information out to you on a monthly basis. If you have any suggestions for the newsletter, please send them to me at lcraig@westgenesee.org. If you have not yet joined the Edmodo K-5 Mathematics group, please do so soon so that you don't miss out on any of the great resources being posted and shared by your colleagues. The group code to join is 9fonhb.

The Standards for Mathematical Practice

This summer we spent a good deal of time diving into the 8 Standards for Mathematical Practice which are equally, if not more important than the content standards. The Standards for Mathematical Practice describe the mathematical skills that should be developed in students in all grade levels. We looked at a short video clip for each of the Standards found at www.mathsolutions.com. The NCTM article that I sent out to K-2 teachers back in June suggested using student-friendly language and terms with which students should already be familiar to facilitate the daily use of Standards for Mathematical Practice (see chart below.) **Attention 3-5 Teachers**: The memo that came out with the Pre-Post Test Learning Standards in August recommends that educators particularly focus on practice standard MP3, "Construct viable arguments and critique the reasoning of others."

CCSS for Mathematical Practice	Student-Friendly Language
1. Make sense and persevere in solving problems.	I can try many times to understand and solve a math problem.
2. Reason abstractly and quantitatively.	I can think about the math problem in my head, first.
3. Construct viable arguments and critique the reasoning of others.	I can make a plan, called a strategy, to solve the problem and discuss other students' strategies too.
4. Model with mathematics.	I can use math symbols and numbers to solve the problem.
5. Use appropriate tools strategically.	I can use math tools, pictures, drawings, and objects to solve the problem.
6. Attend to precision.	I can check to see if my strategy and calculations are correct.
7. Look for and make use of structure	I can use what I already know about math to solve the problem.
8. Look for and express regularity in repeated reasoning.	I can use a strategy that I used to solve another problem.

The practices are more sophisticated at the upper grade levels than they appear here - this is just a way to talk about them at the very early levels. K-2 teachers may want to duplicate this chart and post it in their room. For more information on the Standards for Mathematical Practice, please refer to the handouts that were distributed this summer.

Frequently Asked Questions (F.A.Qs.)

Q: Where should I begin when planning instruction?

A: I would begin by looking at the curriculum map. Rather than go directly to EnVision from there, I would then look at the Standards that need to be taught that month. I would make sure I fully understand each of the Standards. The Standards are detailed on the K-5 West Genesee curriculum document that was handed out this summer. In order to gain a better understanding of each Standard I would look at the unpacking that was done by BOCES last year. (FYI: I copied off all of the Standards that were unpacked and will have them to you this week.) I would then look at the rest of the resources, beginning with EnVision and Study Island. Several other great resources were shared on Edmodo that are worth taking a look at, but I would highly recommend that you begin by making sure you fully understand the Standards you will be teaching.

Q: How come grades 3-5 only have online access to the Teacher's Guides rather than hard copies?

A: As was explained at the summer workshops, we are not purchasing the entire EnVision Program for several reasons. We purchased the workbooks because they are better aligned with the Common Core than what we had been using. Publishing companies are not ready with Common Core aligned programs, and we are not ready to adopt a new program. Please continue to think of EnVision as a resource, supplementing it with Study Island and other materials. Help *is* on the way, however! The teacher guides and center activities are being copied and will be sent to you in the interoffice mail.

Q: How closely do I need to follow the curriculum map?

A: There is some flexibility built into the map, especially in grades K-2. However, it is important that the entire curriculum be taught so you don't want to get too far behind. It is important that 3-5 stick closely to the map in order to teach the pre-test standards in time for the test. Again, there are buffers built in, but you don't want to stray too far from the suggested times. The main purpose of the mapping sheets that were distributed is to hear from each grade level about the pacing - primarily the pacing of the Standards being taught, not the EnVision program. As a reminder, please turn in one of these per grade level by the 10th of each month (for the month preceding.) Thank you.

Math Talk Moves

Math talk moves are effective teacher actions used to support the instructional goal of mathematical thinking and learning. We discussed these at the summer workshop. I recently heard that someone has these posted in their room. This is a great idea - it reminds both the teacher as well as the student how they are to be used. These five talk moves come from Math Solutions:

- **Revoicing**—repeating back what a student has said to confirm what the student said was understood (*So you're saying that's an odd number?)*

- **Repeating**—asking students to restate someone else's reasoning (*Can you repeat what Josh said in your own words?*)

- **Reasoning**—asking students to apply their own reasoning to someone else's reasoning (*Do you agree or disagree and why?)* (Similar to MP #3)

- **Adding on**—prompting students for further participation (*Who can add something more to this?*)

- **Waiting** (*Take your time to think . . . we'll wait.*)

Math talk moves are a great strategy for encouraging productive discourse in the classroom.

Kindergarten

The CCLS standards focused on in kindergarten this month all fall under the **Counting and Cardinality** cluster, which is one of the three major clusters for kindergarten. Major clusters are areas of intensive focus where students need fluent understanding of the core concepts. The major concepts should take up about 70% of the year. Students need to know number names and the count sequence, count to tell the number of objects, and compare numbers. The Rekenrek is a valuable tool to help students count and compare numbers. If you haven't purchased one yet, make sure you put it on your budget for next year. I would suggest buying a large one for modeling and a classroom set. The Rekenrek can be used in the whole group, in small groups, and one-on-one. Rekenrek guides can also be purchased that come with lesson plans and activities. They are not all that expensive and can be ordered through NASCO. *Count Around the Circle* and *Today's Number* are also great strategies for helping students learn to count and build number sense. Both of these strategies are detailed in the book, *Number Sense Routines: Building Numerical Literacy Every Day in Grades K-3,* by Jessica Shumway*.* Each building has one copy of this book. If you would like more information on this strategy, please let me know.

1st Grade

The CCLS Standards focused on in 1st grade from now until December all fall under the **Operations and Algebraic Thinking** cluster which is one of the three major clusters for 1st grade. Major clusters are areas of intensive focus where students need fluent understanding of the core concepts. The major concepts should take up about 70% of the curriculum. At the 1st grade workshop on October 11th Susan Deegan will be sharing some strategies with us for building number sense (an awareness and understanding about what numbers are, their relationships, their magnitude, and the relative effect of operations on numbers, including the use of mental mathematics and estimation.) Susan will demonstrate some number sense routines from the book, *Number Sense Routines: Building Numerical Literacy Every Day in Grades K-3*, by Jessica Shumway. Also at next week's workshop Kelly Vincentini will be modeling different strategies for addition and subtraction, which is the primary focus for 1st graders for the next 4 months.

In an upcoming newsletter I'd like to share how different classroom teachers are making math centers work in their classroom. I know some teachers are experimenting with guided math groups and others are experimenting with centers on a daily, every other day, or weekly basis. I'd love to hear how you're making it work so I can share it with others. Please send me an email to let me know. Thanks!

Have You Considered . . .

Have you considered having a math word wall? In the article I sent out to K-2 teachers from NCTM in June it states, "What approach might a teacher take to create a culture of mathematics learning and doing in a classroom? When children walk into a classroom, it should be apparent that math is as important as reading (sorry, Deb.) A true culture of mathematics would have word walls adorned with mathematical terms in addition to sight words and spelling words. The classroom library would have math-concept literature books and manipulatives alongside toys and games to challenge growth and learning. Children would be invited to pose and post mathematical questions, which would be displayed on a bulletin board or chart paper. Math songs may be playing in the

2nd Grade

The CCLS Standards focused on in 2nd grade from September to December primarily fall under the **Number and Operations in Base Ten** cluster which is one of the three major clusters for second grade. Major clusters are areas of intensive focus where students need fluent understanding of the core concepts. The major concepts should take up about 70% of the curriculum. I hope you will be able to attend the 2nd grade workshop on October 16th. Laura Hesler and Wendy Vogt will be sharing all sorts of strategies you can use to help students gain a better understanding of addition and subtraction and of place value concepts. One of the strategies Laura shared with us this summer was the open word problem (that may not be the technical name—I can't think of it right now.) This is where you put up a problem without any numbers so that students are forced to think about the problem before they jump to the answer. It's a great strategy for every operation and ever grade level. Here's an example:

There are ___ students on the playground. ___ more students showed up. How many students are there now?

Standard 2.0A.2 mentions the word fluently when students are adding and subtracting numbers. Fluently means accuracy (correct answer), efficiency (within 4-5 seconds), and flexibility (using strategies such as making 10 or breaking apart numbers.) Research indicates that teachers can best support students' memorization of sums and differences through varied experiences making 10, breaking numbers apart, and working on mental strategies, rather than repetitive timed tests.

3rd Grade

Please take a minute to also read the second grade information as I believe you may find some useful information there. The CCLS Standards focused on in 3rd grade from September to December primarily fall under the **Operations and Algebraic Thinking** cluster, which is one of the major clusters for third grade. Major clusters are areas of intensive focus where students need fluent understanding of the core concepts. The major concepts should take up about 70% of the curriculum. The 3rd Grade Common Core State Standards Flip Book created by the Kansas Association of Teachers of Mathematics (KATM) is filled with information that I'm sure you will find useful when teaching these Standards. They give explanations and examples of each Standard, instructional strategies for teaching the standards, and also list instructional resources and tools. It is a lengthy document which is why I didn't hand it out at the summer workshop, but you can locate at it at katm.org. If you are unable to find it just let me know and I'll send you the link. Or, better yet, I'll post it on Edmodo. Please make sure you've signed up to join the K-5 Mathematics group. I hope you are able to join us on October 29th for the 3rd Grade workshop.

Grade Level Workshops

K: October 18th

1st: October 11th

2nd: October 16th

3rd: October 29th

4th: October 25th

5th: November 6th

All workshops will be held from 4:00 - 5:30 in the East Hill Library. There will not be make-ups for these workshops so please make sure you get the information from a colleague if you are unable to attend.

4th Grade

The CCLS Standards focused on in 4th grade from September to December primarily fall under the **Number and Operations in Base Ten** cluster and the **Operations and Algebraic Thinking** cluster, which are two of the three major clusters for fourth grade. Major clusters are areas of intensive focus where students need fluent understanding of the core concepts. The major concepts/clusters should take up about 70% of the curriculum.

The following example that addresses both content standard 4.OA.3 and several of the mathematical practices came from the Kansas Association of Teachers of Mathematics website. They have published a flipbook for each grade level that defines each standard and gives examples. You can find it at katm.org. Standard 4.OA.3 asks for students to: *Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.* **Example:** Write different word problems involving 44 ÷ 6 = ? where the answers are best represented as:

Problem A: 7
Problem B: 7 r2
Problem C: 8
Problem D: 7 or 8
Problem E: 7 2/6

This certainly makes students *make sense of word problems and persevere in solving them*!

5th Grade

The CCLS Standards focused on in 5th grade from September to December primarily fall under the **Number and Operations in Base Ten** cluster, which is one of the three major clusters for fifth grade. Major clusters are areas of intensive focus where students need fluent understanding of the core concepts. The major concepts should take up about 70% of the curriculum. A lot of instruction in September should have centered around decimals. Here are two problems I came across in a workshop I attended this past summer that address both the content standards as well as some of the practice standards.

Explorations With Decimals: Number Riddle   1 __ . __ __ __ (Draw on board)

Clue 1: The digit in the hundredths place is double the digit in the tenths place.
Clue 2: The digit in the tenths place is odd.
Clue 3: The digit in the thousandths place represents the sum of the digits in the tenths place and the hundredths place.
Clue 4: The digit in the ones place is four times the digit in the hundredths place.
Question: What's the number?

Explorations with Decimals: Moving the Decimal Point
1. Work with the digit sets 1234 and 987
2. You may insert a decimal point just before, within, or after each given set of digits.
3. You cannot change the order of the digits.
4. You may add zeros only if they do not change the value of your number.
5. Find ways to insert the decimal points so that you can get five different sums using these two sets of digits.
6. What is the largest sum that you can make?
7. What is the smallest sum that you can make?   Have fun!