
Upper East Tennessee Council of Teachers of Mathematics

NEWSLETTER

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APRIL 2018



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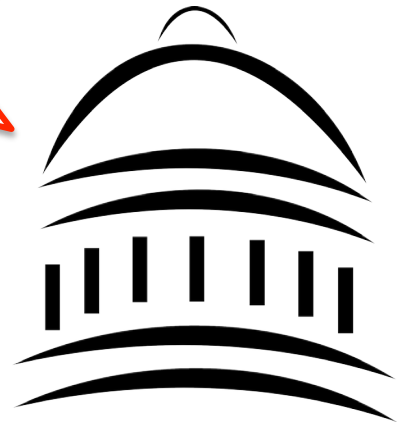
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NCTM springs into summer: Advocacy + added resources!

NCTM SPEAKS UP for Math Teachers!

*Teams set to advocate on Capitol Hill at the
2018 Annual Research Conference.*

Specially prepared volunteer NCTM teams will visit congressional offices during the 2018 Annual Research Conference in April, to initiate relationships, share the importance of math instruction and provide feedback about legislative impacts. For more information, click [here](#).



DON'T MISS OUT ON SUMMER FUN(DS)!

Remember, NCTM's Mathematics Education Trust (MET) funds individual teachers in their efforts to enhance the teaching and learning of mathematics. The deadline for the summer cycle of MET grants and scholarship proposals is May 4. (Proposals must be postmarked by that date.) For more information about the grants and past grant recipients, click [here](#).

S-STEM Cohort Opportunity!

A grant designed to empower the national workforce through education in STEM disciplines is allowing ETSU to offer a fifth and final cohort scholarship opportunity starting in Summer 2018 for students who major in STEM disciplines with a minor in mathematics that emphasizes the interplay between data, simulation and modeling.

As many as 14 first-time freshmen students will be selected and funded through the S-STEM grant; to be eligible for consideration, students must be nominated by mathematics teachers or school counselors. Eligible students must have:

- Earned an ACT score of at least 28.
- Passed the AP Calculus I exam or completed MATH 1910 Calculus I as a dual-enrollment student with a grade of at least B+.

Nominees must also declare one of the following majors during their freshman year: Mathematics, Chemistry, Geosciences, Physics, Biology, Computing, or Engineering. The two course pathways include:

Plan Calc

SUMMER 2018:

Calculus II (MATH 1920)

FALL 2018:

Linear Algebra (MATH 2010)

**Probability & Statistics
Calculus Based
(MATH 2050)**

SPRING 2019:

**Statistical Modeling
(STAT 3050)**

Plan LA

SUMMER 2018:

Linear Algebra (MATH 2010)

FALL 2018:

Calculus II (MATH 2010)

**Probability & Statistics
Calculus Based
(MATH 2050)**

SPRING 2019:

**Statistical Modeling
(STAT 3050)**

For more information about the program, contact Dr. Ariel Cintron-Arias at cintronarias@etsu.edu or 423-439-6977.

Why Does Special Education Scare Teachers?

By
Susanne Rinkel

Special education students are misperceived at times. As a special education teacher I want to help the teachers with the “jitters” about teaching a student who has a disability. Notice I stated a “student with a disability” not a “disabled student.” Every student is able to learn but all in their own way. Students may test low in mathematics but at the same time are proficient in some areas in mathematics. Teachers need to understand how the students learn and be willing to have a growth mindset in order to reach all students on their level. Students with disabilities may just take longer to grasp a concept or may not understand the process in the one way it was presented. When a teacher has a few strategies for each concept being taught it allows students on all levels to learn.

There are many strategies that teachers can use in the classroom that just take a little extra time planning. The teachers can use small groups based on skills. That is not to say that all of the lower students should be grouped together. The students’ skills should be assessed

so that if there are some students who are proficient with multiplication then they should be grouped with others who are proficient. All of the lower students should not just be grouped together the whole year with the assumption that they are low achievers in mathematics. Each student has a strength and should be able to shine in that area.

Another strategy to use is to create centers based on skills. The students can go to different centers with one including the teacher, as this would allow the teacher to flow through the room to assist students within each center.



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Why Does Special Education Scare Teachers?

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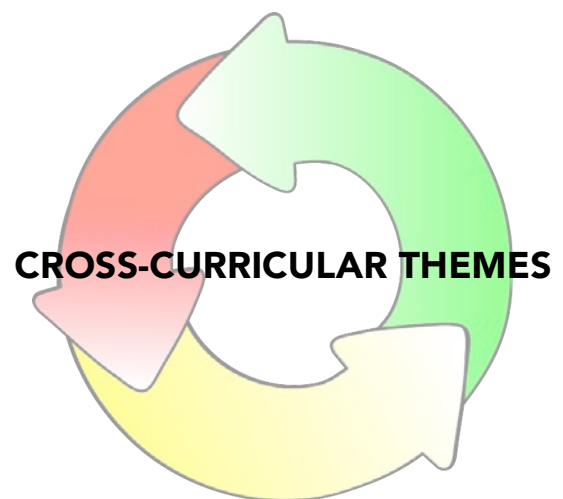
A third strategy is to try thematic instruction. Thematic instruction would require the grade-level teachers across all subjects to coordinate their instruction. The teachers would need to collaborate on what common theme is being taught and how they can help to bring that into each subject area. The students with a learning disability may grasp the concept in a more concrete way when they are seeing the theme throughout the day or week.

A final strategy is to have leveled books or materials so that the students are met on their level. A student may be able to multiply multi-digit numbers but with a different strategy than the traditional mathematical way.

We all learn in our own way, and it is important to embrace the different strengths that each student has, and to have an environment where it is okay to use a different process. It is important for teachers to praise the process with the students. I have had students in the past who have struggled in mathematics class,

but when they are paired with a teacher who praises their process it allows them to feel successful and persevere until they reach the solution.

Special education was designed to protect the rights of the individuals with disabilities so that those with a disability are given the same opportunity as other citizens, not to scare teachers away from wanting to teach the students. Special education and general education should never be considered to be similar.



Students may grasp the concept in a more concrete way with thematic reinforcement.

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Why Does Special Education Scare Teachers?

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Special education is an individual plan that is specialized for the student with a goal-driven instruction (Heward, 2012. Pp. 33). General education teachers need to be able to differentiate instruction, so that all students are able to learn the material whether they are students with an IEP or not.

As a special education teacher it is my goal to help teachers, parents, and students to be successful in all areas. Mathematics is an important life skill so we as teachers do not want to scare students away from mathematics. I try to assist the

students with the missing skills needed to be successful on grade level while also helping the grade level teacher to be able to reach each student. Don't let special education scare you into thinking you are not able to reach that student without hours upon hours of planning. A teacher and I took time to see what level a student was on and met him on that level. He was able to go from below basic in mathematics to proficient because he was praised for the process and he persevered. Never give up on a student!



Sources: Heward, W. (2012). *Exceptional children: An introduction to special education (with Myeducationlab)*, 10th ed. Upper Saddle River, NJ: Pearson College Div.



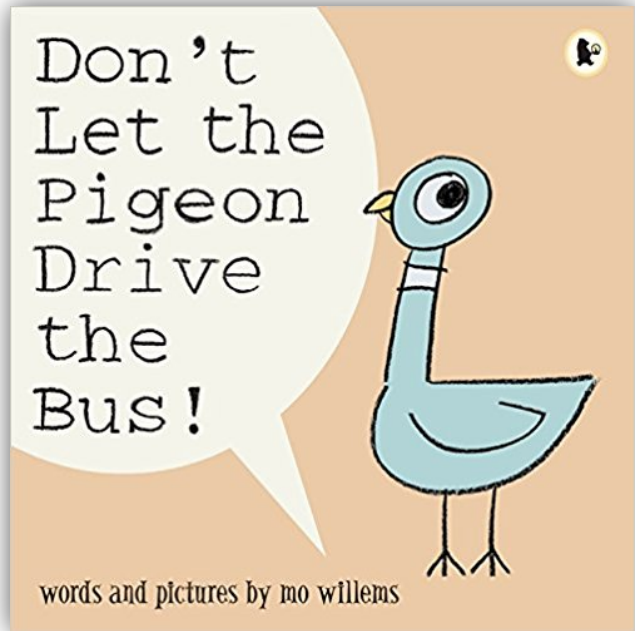
DON'T LET special education scare you into thinking you are not able to reach a student without hours upon hours of planning....Never give up on a student!



Infusing Literature into Math

By
Missy Byrd

One of my greatest joys as a first grade teacher is enjoying a great book with my students! On the first day of school, I introduce my children to Mo Willems and his infamous Pigeon. I begin with my favorite story "Don't Let the Pigeon Drive the Bus," in which the Pigeon dreams of driving a bus and the bus driver entrusts the reader to keep this from happening when he leaves to run an errand. I realize I have accomplished my goal when I finish reading the story and hear these excited little voices exclaiming, "Read it again!" My reply is always, "Oh, did you like that one? It is one of my favorites too!" Discussion erupts about why we love this story so much. We notice the techniques Mo Willems uses that capture our attention. We love his use of speech bubbles and how they are the same color as the character speaking. He uses no background in his illustrations, and we suspect this is to focus on the characters and what they are saying. I then apologize to my eager students and explain that we just don't have enough time to read it again right now. The moans and groans confirm my plan is working. Their disappointment turns to



exhilaration when I reveal Mo wrote additional Pigeon stories and we will be reading one each day this week. Immediately, I have formed a relationship with my students, something that we can look forward to enjoying together every day.

As I meet my students at the door on the second day of school, I listen to their conversations and am pleased to hear that they can't wait to make their way into the classroom to look on the display rack for today's featured Pigeon book. A crowd

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Infusing Literature into Math

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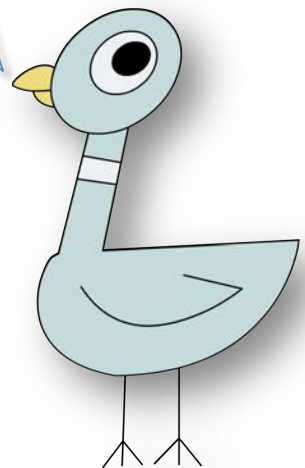
begins to form around the book rack as they begin trying to read the title and start discussing the illustrations on the cover. Excitement is in the air, and we work diligently to complete our morning procedures so we can meet at the reading rug. Finally, it is time to read "The Pigeon Finds a Hotdog," and it is worth the wait! We love this one too! Upon completion, I present an envelope addressed to our class, and the return address belongs to none other than Mo Willems. Included in the envelope is a letter from Mo stating that he has been told that we really enjoy his Pigeon stories and that he is going to do something that he normally does not do – teach us how to draw the Pigeon. We follow the enclosed directions and are thrilled to see the Pigeon appear on our paper. Mo Willems just became our favorite author!

I now have an immediate hook for math! The Pigeon can enter our math lessons to create the same enthusiasm for our math block. I ask the students to take out their math journals and draw the Pigeon peeking out from the side of the paper with a speech bubble above his head. I

present a math problem and have students explain how the Pigeon solved the problem in his speech bubble. They can share this with a partner in their best Pigeon voice. I have multiple copies of both "The Pigeon Finds a Hot Dog" and "Don't Let the Pigeon Drive the Bus." The students will choose a book and use a sticky tab to mark their favorite page. They will create a math problem about the page that was chosen: If nine pigeons are on a bus and seven get off at the first

$$2 + 6 = 8$$

**SOLVING
PROBLEMS
INSIDE
SPEECH
BUBBLES**



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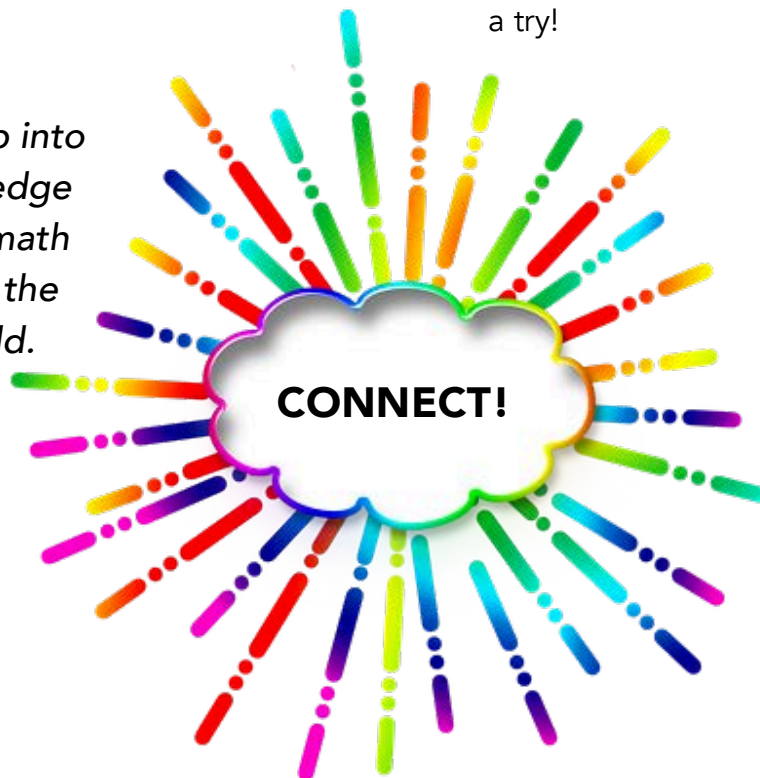
Infusing Literature into Math

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stop, how many pigeons are left on the bus? I will scan the room to find a few that I feel would be good examples to share with the class. These children will read their math problem, and we will work these out together on the board. I may assign the opposite book tomorrow to do the same activity and look for improvements in their work. Using literature in this lesson helps provide a meaningful context for the math concept, as well as aids students in building problem solving skills.

Infusing literature into math is a great way to enhance or supplement a lesson. This can be very motivational to students as they are introduced to new concepts and can explore alongside these characters. When children are reading or listening to a book, they learn to recognize that math is used all around them. They begin to tap into their prior knowledge to connect math concepts to the outside world. Each book can be tied to any math concept with a little creativity and ingenuity. So choose a few of your favorites and give it a try!

Students tap into prior knowledge to connect math concepts to the outside world.



You're Invited

By
Kristen Richards

Sometimes one of the hardest tasks as a teacher is finding a hook for a lesson. Grabbing the students' attention in the beginning is what can make all the difference in the outcome of a day's work. Thanks to a colleague of mine, Ms. Brennan Trent, I have been introduced to a new hook for teaching the distributive property that works. This hook not only gets the students motivated, it also is easy for them to remember and apply in more complicated problems.



The hook for using the distributive property is having a party. Say what?!?!? You heard right. Hosting a party is the key to making the distributive property fun for the students. The concept is pretty simple. Three days before I begin this lesson, I distribute invitations to a party hosted in my room, inviting the students to bring packaged snacks for all to eat and drink on the day we are planning to have the lesson. The kids begin talking and questioning what the party is about – this is where the fun and curiosity sets in. The anticipation to come to class is at an all-time high during the wait for the party.

On the day the party method is introduced I usually set the party vibe by a decorated classroom, a disco ball, and music turned up (but not enough to disturb other classes). When the bell rings to start class I begin with a funny GIF that has to do with a party – usually a zebra dancing. Then, I have the students answer the following question: What makes a host good? You can probably imagine some of the answers I have been given in the past – good food, music, drinks, games, entertainment, etc.

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You're Invited

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However, the key to this question is that a good host always visits every guest at their party. Almost every time I have asked this question in class, this answer has been given. I explain to students since this is my party for the class, it would be rude if I did not take a moment to speak to each of them. Once we discuss the correct answer, it is time to begin showing how hosting a party directly relates to the distributive property.

Now keep in mind, since I teach freshmen algebra, my students have usually already seen the distributive property before they entered my class. However, I reteach the general idea of distributive property when I introduce multiplying polynomials to my students. During this process, there are usually four steps I give the students to make the process even simpler: 1) choose the smallest polynomial to be the host; 2) allow them to 'visit' every 'guest' at their party through multiplication; 3) combine like terms; and 4) write in standard form.

Most of the time when I explain multiplying polynomials by using the party method, you can see the students' interest rising and you can see learning taking place. Teaching the distributive property in this manner is not necessary, but it does make it more interesting for the students to learn, which usually allows the teacher to reach more students.

4 STEPS TO A PROPER POLYNOMIAL PARTY:

1. Choose the smallest polynomial to be the host
2. Allow students to "visit" every "guest" at their party through multiplication
3. Combine like terms
4. Write in standard form

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You're Invited

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As a freshman algebra teacher of three years, I taught multiplying polynomials my first year just by the distributive property and the FOIL method. My second year of teaching I tried the party method as Ms. Trent had suggested. It was unbelievable to see the amount of retention the students had regarding multiplying polynomials as compared to the previous year. That result in itself showed me how important it is to find an appropriate hook for every lesson that not only gains the students' attention, but makes it relatable to their lives. I'm certainly thankful this idea was shared with me, and I am more than thrilled to share it with others. Again, credit for the party method must be given to my colleague and friend, Ms. Brennan Trent.

■

RESULTS WORTH CELEBRATING!



"It was unbelievable to see the amount of retention the students had regarding multiplying polynomials as compared to the previous year."



Show Me the Thinking!

By
Heather Jeffers

Why Asking for More than a Number Is Beneficial for Comprehension.

Eight. Eight what? Eight cookies? Eight airplanes? Eight million dollars? Well, how did you get that answer? Mental math computation? By creating and utilizing an illustration that represents the problem? Through observation and “borrowing” your neighbor’s final answer? When a simple numerical response is provided to a word problem or task, a variety of questions are left unanswered. Through written explanations and rationale of thinking, readers can gain much insight to student thinking processes and strategies. One of the greatest opportunities for assessing student comprehension is provided by word problems or tasks that require students to explain what strategy was used in finding their answer and if errors were made, where those occurred in the computation.

General comprehension is positively influenced when students are prompted to provide a written trail of individual thinking. So why not make this concept a routine in mathematics? This idea complements more than half of the “Eight Standards of Mathematical Practice.” Those standards that may be targeted include: making sense of problems and persevering to solve them; reasoning abstractly and quantitatively; constructing viable arguments and critiquing the reasoning of others; modeling with mathematics; attending to precision; looking for and making use of structure; and finally, looking for and expressing regularity in repeated reasoning. A simple numerical answer hardly reveals what mastery an individual has. Based on this



A written trail of individual thinking complements more than half of the “Eight Standards of Mathematical Practice.”

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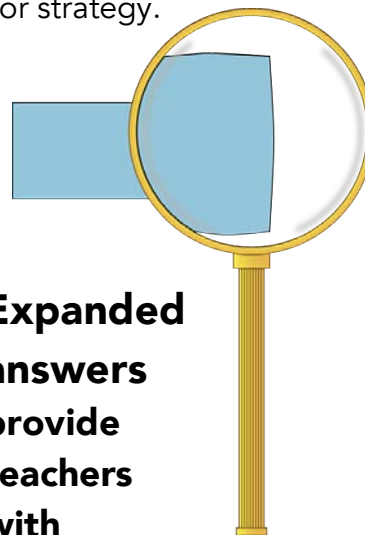
Show Me the Thinking!

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knowledge alone, it can be inferred the deeper a student “digs” into providing a written blueprint of thinking, a higher probability skills or standards have been grasped.

Now, let’s say a student has developed beautifully crafted illustrations with labeled categories and paragraph justification for his thinking process. There’s just one small issue. The final answer is wrong. Even though it was concluded Jack returned home from soccer practice at 7:45 pm versus the correct answer of 7:20 pm, the information obtained through this expanded answer format is worth much more. What strategy did Jack use when solving the problem? Was a careless error made in addition or subtraction computation? Does Jack even possess reading comprehension skills needed to deconstruct the word problem and identify key details? Little does he know that even though his highlighted and circled findings may be incorrect, his teacher has gained a great deal of information about his overall mastery of time.

Partitive and quotitive division are two mathematical concepts that may rely heavily on a constructed response of some form. Final answers can be incorrect when numbers are not computed through an illustration or number sentence of some form. Students can easily divide fractions by decomposing a picture representation. This is especially true when dealing with continuous objects. When more than a single numerical response is expected, students strive to provide their audience with a clear insight into their thinking pathway or strategy.



Expanded answers provide teachers with insight and information about the student’s overall mastery.

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Show Me the Thinking!

(continued)

The benefits of asking for “more than a number” even impact other students and classmates. Students are able to explore other strategies than their own. This may even provide a friendlier technique for those struggling with a concept or operation. Peer interaction and small group discussion can complement this sharing of ideas. When expectations are set high for student comprehension, this single instructional tool can contribute to individual growth.

The bottom line? When students explain their reasoning for a given response, a strategy is more deeply rooted in long-term memory, misconceptions or errors can be more easily identified, and those struggling individuals benefit from routine exposure to mathematical concepts. There is much more behind student thinking and processing than a number. Let’s give our students opportunities for growth.



“Peer interaction and small group discussion can complement the sharing of ideas.”

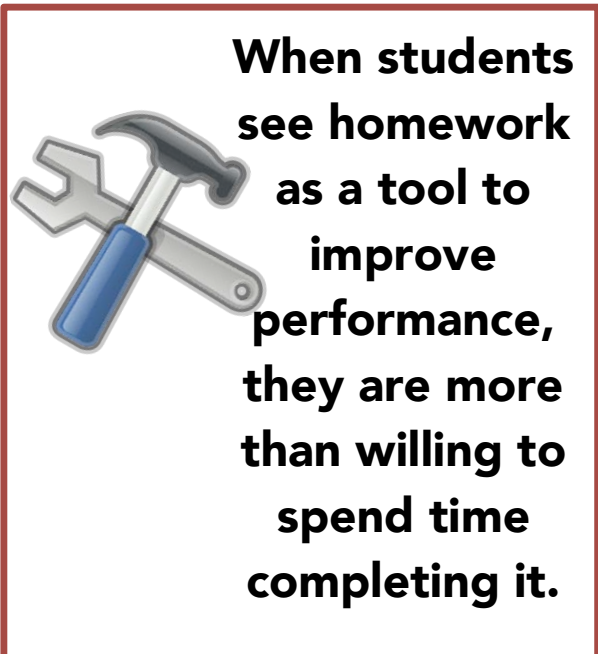


Standards-Based Grading

For the past two years, I have been using a modified standards-based grading system in my middle school math classroom. I always receive quite a few gasps from my students when they find out that the only grades that will be entered in the gradebook will be tests and quizzes. Fear takes over the students who are listening until they learn that all quizzes and tests may be attempted numerous times. Since I have started using this system in my classroom, it has created an environment where students are not afraid to make mistakes and also has encouraged students to have more ownership of their learning.

While only tests and quizzes are entered in the gradebook students still have classwork and nightly homework to complete. Nightly homework consists of 5-7 problems consisting of current and previous standards. When I implemented this new program I was concerned that since homework would not be given a grade, even if it was just a completion grade, that the majority of my students would not complete their nightly homework.

To my surprise, almost all of my students completed their homework thoroughly. I would have students who would not complete any other homework except for their math homework. At the end of the year my students completed a survey about my math class. I was overwhelmed by their responses regarding homework. My middle school students were able to acknowledge that since the homework was not mandatory and instead a tool to help them perform better, they were more than willing to spend the time completing the practice.



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Standards-Based Grading

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Since only tests and quizzes are recorded grades, quick quizzes are given frequently. Students will typically have 3-4 quick quizzes a week. The goal is to give multiple quick quizzes per standard. The quick quizzes determine which students are ready to move on within a given standard and which students still need extra practice. If a student earns a perfect score on their first quiz on a given standard, that student will now have their own enrichment pathway to complete. If a student wants to retake a quiz, because they believe they have now mastered the standard, they must first complete a remediation pathway. This pathway gives students some extra practice and a chance to reflect on their original mistakes. When a student retakes an assessment the most recent score will be the score recorded in the grade book. Students may complete remediation pathways and retakes from any standards that have been previously completed. That means if a student in

December completes a remediation pathway from August, that student can retake the quiz and replace their grade that was recorded in August. While allowing retakes from the entire year at any point in the year can sometimes be difficult to manage as a teacher, the goal of this system is for your students to master as many standards as they can in their own timeframe.

Since implementing this modified standards-based grading system in my classroom I have noticed that my students have taken more ownership of their learning. When an assessment is returned that has not met mastery, my students now are eagerly analyzing their mistakes so that they can determine what they need to focus on within the standard. While this system at times can be overwhelming for me, it has changed so many of my students' views about math and their ability to succeed in math class.

The remedial pathway gives students some extra practice and a chance to reflect on their original mistakes.

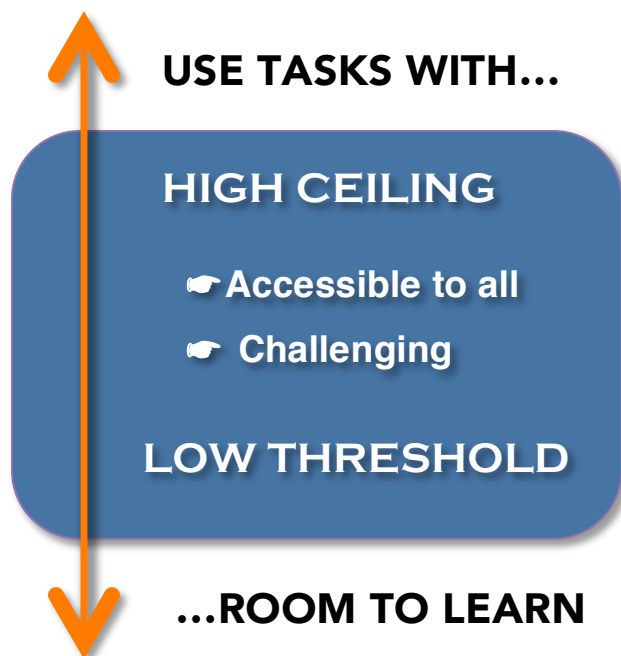


Setting Up Daily Math Routines

By
Mary Ellen Smith

Race to the Top: If you have been in education for any length of time, you are probably familiar with this national campaign designed to reform education in the K-12 classroom. Tennessee has been at the forefront of this movement encouraging teachers to close gaps and raise scores for student proficiency. But what do we do when a student arrives in our classroom and they are already behind? Is it a fair race if everyone begins their educational sprint at different starting lines? To help close gaps many schools began implementing Response to Intervention (RTI) programs. In theory, the idea is a good one: Take a student who is behind in an area, and work with them additional time outside of the normal instruction block. However, many teachers will tell you that finding the time and/or a qualified instructor to help during that time is a huge hurdle. For math educators the hurdle grows ever higher, as many schools only designate time or funds for RTI for English Language Arts deficits.

So how can math teachers even the playing field for students coming in "behind"? One suggestion is to plan daily opportunities for students to practice or pick up information they may be missing, sort of a daily RTI time carved into your math block for everyone. In order for daily math routines to be successful, the math activities need to be accessible to all but also challenging. These kinds of activities have been recently labeled low-threshold, high-ceiling math tasks. Choosing more open-ended math challenges, tasks, or games also ensures that the students are excited about mathematics.



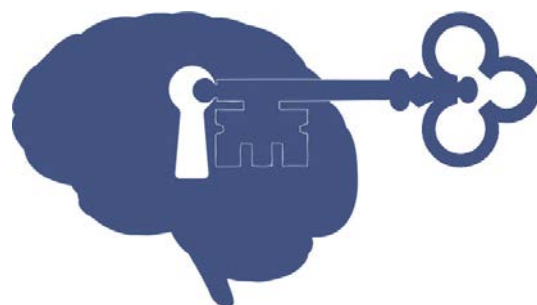
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Setting Up Daily Math Routines

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Students who are struggling to develop number sense need many opportunities to practice “seeing” numbers and manipulating them. Subitizing (instantly seeing how many) activities are a great routine to incorporate to help deepen number sense. And although subitizing is the latest “big thing” in early grades, it doesn’t need to stop there. Consider using mathematical images with fractions, money, base ten blocks, arrays, etc. Play a game of quick images where you display the model or picture for only five seconds and then ask students what they saw. Subitizing leads the way for students to move into mental math where they are seeing quantities as flexible.

The more students practice and make sense of numbers the more fluent they become. Fluency practice is another great skill to incorporate into a weekly math routine. Before throwing a high-stakes, timed multiplication drill at your students, stop and consider what we now know about fluency. Computational fluency involves being able to efficiently and accurately come to a solution. To do this



**SUBITIZING OPENS THE WAY
FOR STUDENTS TO MOVE
INTO MENTAL MATH.**

the student needs a deep understanding of what he or she is doing with the numbers, have multiple ways to access the problem, and be able to explain his/her thinking. There are many math games that are easy to play that help students become more fluent. One example might be having students make a tower of a given number with snap cubes. Let’s say each student has a tower of ten blocks. They then partner to play a quick game of “How Many Am I Hiding?” One partner closes his eyes while the other partner breaks the tower and hides one part behind her back. Then the first partner looks at the cubes still remaining to determine how many are behind the other partner’s back.

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Setting Up Daily Math Routines

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Number Talks are another great routine. Number Talks involve giving students a problem to solve mentally. Subitizing, in fact, can be a number talk, as students are being asked to show how they saw the image. However, a traditional two-digit addition problem can also be a number talk once students have the skills available to see that quantity mentally. So before introducing a two-digit addition problem in a number talk, students should have had ample opportunities to understand what those numbers represent (some tens and ones) and also strategies for making the numbers friendly enough to manipulate mentally.

Now students not only have some number sense in their mental math tool kit, they also are discovering more efficient ways to solve problems. This leads to another great routine to set up: Math tasks. Math tasks generally focus on one mathematical idea. There are endless niche math tasks popping up regularly if you look for them on the Internet.

I mentioned low-threshold, high-ceiling tasks earlier, but there are also three-act tasks, rich tasks, etc. You can easily find one related to almost any mathematical area or age range. Any good math task will incorporate the following areas: it will have real world application or meaning for the students; it will be accessible and challenging for all students; it will spark conversation and allow students to defend or support their thinking; it will have multiple pathways to represent or get to a solution; and most importantly it will be engaging to students.



TASK CHECK:

Real-world application

Accessible + challenging

Spark conversation and allow students to defend their thinking

Multiple pathways to a solution

MUST BE ENGAGING!

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Setting Up Daily Math Routines

(continued)

Recently, I attended a class where I was given a math task that involved math skills I have not used in years. At first, I was nervous, and then I realized I was allowed to discuss my thinking with other students. One student helped me remember how to calculate volume. From there I was able to work out my own way to find a solution to the problem. On another day we did what appeared to be a very complex task, and I remembered a strategy another student had shared earlier in the week. I was able to use her strategy and work my way through the problem. My way was by no means the most efficient way, but in the end I was successful. These kinds of tasks allow all students to struggle, grow, and thus feel proud of themselves as learners. They also allow you as the teacher a better glimpse into what your student does or

does not know. While many math tasks lend themselves to students going deeper and thus take more time, there are plenty that could be just a quick warm-up for the brain before the day's lesson.

Finally, when setting up a weekly math routine, think about incorporating a day for some kind of spiral review or practice for all students. This could be achieved by any of the previous means mentioned including: number talks, playing a game, math tasks, etc. If we truly want every student to make it to the top we need to allow them continuing opportunities to be successful. Think about how you can work in one of these activities daily to ensure all students cross that finish line!

“In the Race to the Top, if we want every student to make it we need to allow them continuing opportunities to be successful”



UETCTM Leadership 2018-2019

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Membership Application 2018-2019



Complete application and return to Amy Glass with a check for \$10 made payable to UETCTM. Mail completed application and check to:

Cameron Buck
UETCTM Treasurer

817 Indian Trail Drive, Apt. A04
Kingsport, TN 37645

Name: _____

Home Address: _____

Home Phone: (____) _____ - _____

School: _____

School Address: _____

School Phone: (____) _____ - _____

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