

APRIL 2022 VOL.22 ISSUE 6

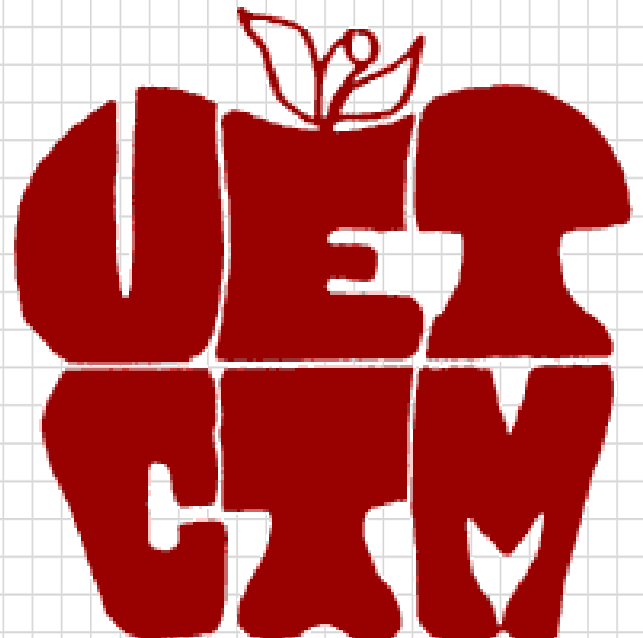
UETCTM

Upper East Tennessee Council of Teachers of Mathematics



**FEATURING ESSAYS
WRITTEN BY
TEACHERS
COVERING:**

**2nd Grade
4th Grade
5th Grade**



IN THIS ISSUE

The Impact of Data on Motivating Students

By Jordan Williamson 3

Incorporating Play Into the Classroom

By Marie Taylor 7

The Power of Why

By Kristie Shelton 13

Math and Literacy Integration

By Angelo Brewing 17

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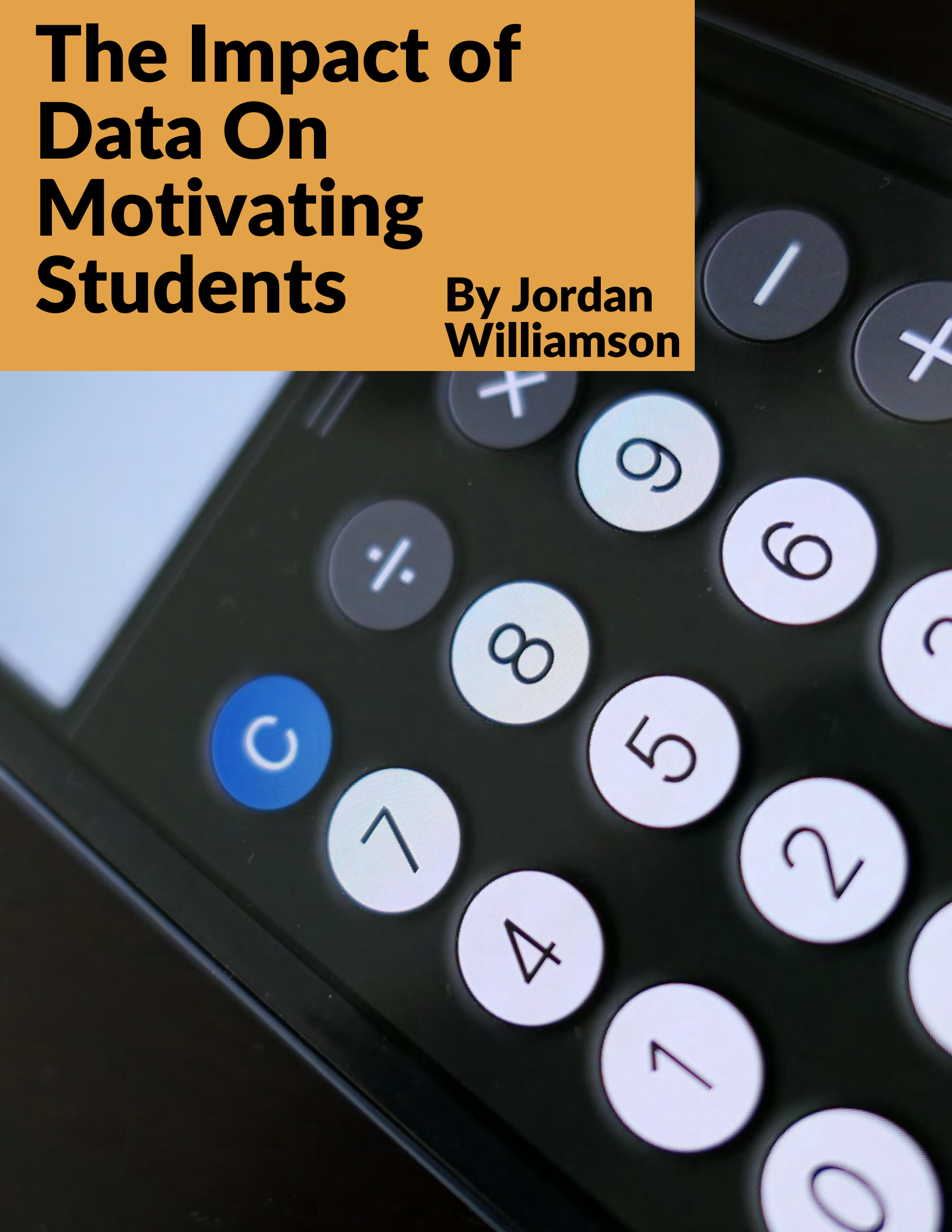
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**Teach them to think outside the box and look at it through a different set of lenses. Teach them it is okay to make mistakes, work out the process, and find a path that works for them. -
-Kristie Shelton**

The Impact of Data On Motivating Students

By Jordan Williamson



progress on tests and assignments, pages for them to set nine-week goals, and an area to track attendance. The best part about these data notebooks is that students do all of the work once they are instructed how to do it! They come in each morning and shade in their attendance. This helps them keep track of days they have missed to make up assignments. They have access to student friendly state standards that allow them to understand what is being asked of them. They also have a visual representation of their growth. Finally, students set their own, tangible goals that they reflect on at the end of each nine-week period.

The number one struggle that I have seen in the classroom is motivating students to want to do math. There are so many students that see an equation and automatically say “Nope! I can’t do it. It’s too hard!” They put down their best guess or leave it completely blank and move on with their lives. Why is that? Students nowadays want a goal to reach, or something to beat (such as a high score on a video game). Math equations don’t give students any sort of feeling of success or accomplishment without having a goal in mind. This is where data driven instruction comes into play.

I use data notebooks in my classroom. These are given to the students at the beginning of the year. They include the Tennessee State Standards for Mathematics along with an area for students to write each standard in student friendly terms, charts to log their



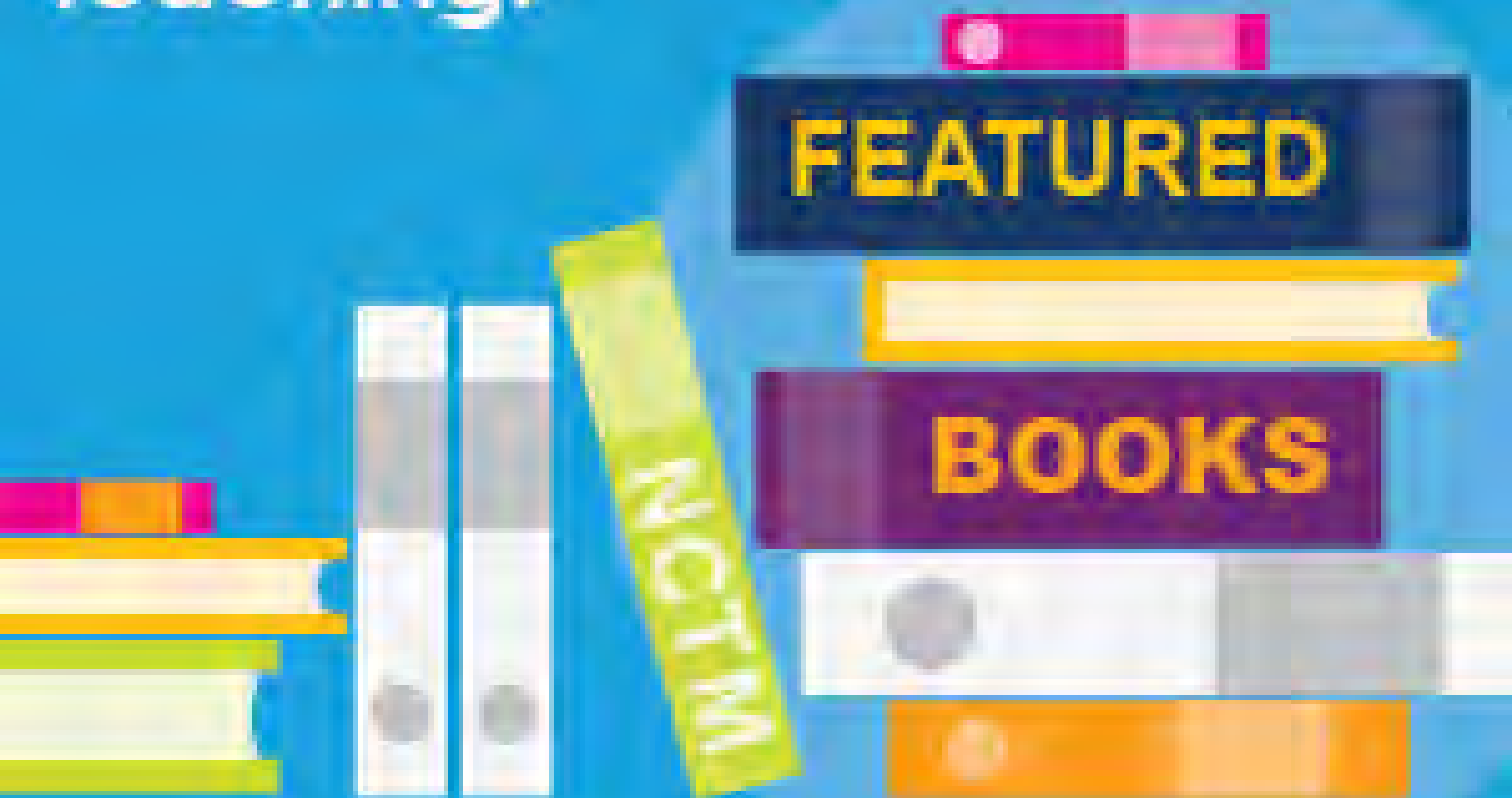
How are students motivated by doing all of these things in a data notebook? Think of it like a video game: A student plays this game in hopes of beating their high score every time. Let's say the student visually sees they have not been doing well on weekly multiplication tests. What do you think will happen? They will go into a competitive mode and want to better themselves by increasing that score, even if just by one point each time. Students will then want to study and see that score visually increase by coloring in a chart with a higher score each week. It's simple: students want a goal to reach. They want to better themselves, all you have to do is provide them with the tools to do so. ■





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Incorporating Play into the Classroom

By Marie Taylor



If someone asked you to close your eyes and imagine a math class, what do you see? Are students sitting at their desks working independently, or are they conversing in groups? What sounds do you hear? Is it quiet, or do you hear friendly conversations? I like to imagine math classes being full of sound and movement, with tools and manipulatives readily available for student use. It should be an inviting setting where students work together and participate in authentic activities. We know that students learn best when experiences in the classroom are purposefully planned, meaningful, and hands-on. One way to achieve this type of lesson in your classroom is by allowing students to play mathematical games. As students are playing, they are developing their language skills with their peers as they work together to solve abstract problems. For example, let's say two students are playing

"Fill the Shape" with pattern blocks. The goal of this game is to see how many triangles it takes to fill a trapezoid, how many trapezoids it takes to fill a hexagon, and so on. After a few rounds, students will begin seeing repeating patterns. The teacher's role in this scenario is to serve as a facilitator for rich discussions and to encourage the students to dig deeper into their mathematical understanding by asking high quality questions as they play. By incorporating play into the lesson, students are expanding their metacognition skills by solving complex tasks, sharing ideas with peers, and reevaluating their own work.

Incorporating play into your classroom is achievable for all grades, not just early childhood. It doesn't have to be loud, messy, or take a lot of time. It can be something as simple as creating a Quizlet, Kahoot, or reviewing a unit

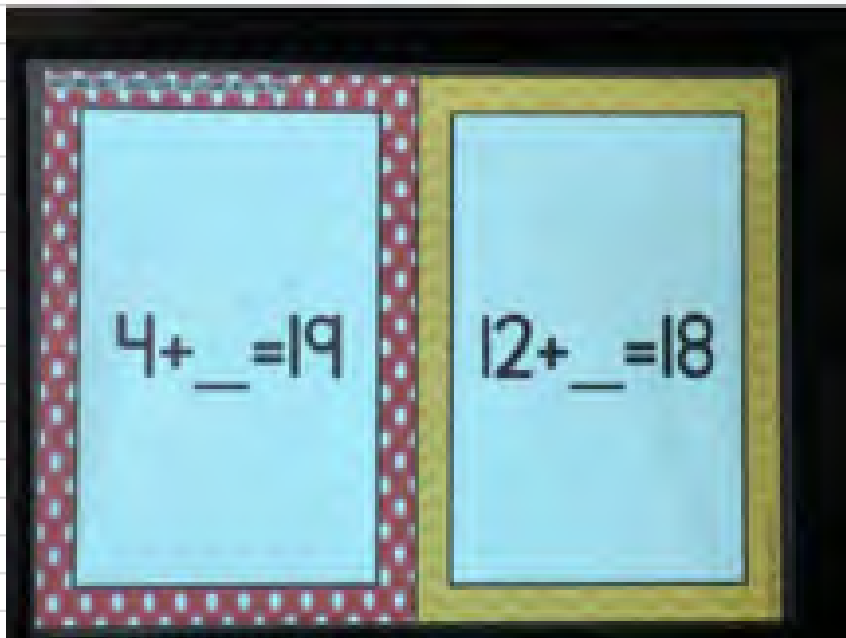
with a Jeopardy style game. Students are engaged and feel motivated to succeed in these fun learning experiences...yes, I said fun! Math CAN be fun! I have found that my students tend to engage in more meaningful and in-depth discussions with their peers when they are working together in a play-based setting. In this relaxed environment, students feel comfortable sharing their thinking and the reasoning behind it.

Here are some math games that I incorporate in our 2nd classroom.

Kahoot / Quizlet Live



These web based games allow you to customize your own game, or utilize resource libraries where there are hundreds of premade games. The premade games can be found by selecting your grade level or applying a filter for your desired topic. During our math block, I often use these two resources to review a particular skill or concept before a test or quiz. These websites also serve as a form of formative assessments. They allow the teacher to see which students miss certain problems. At the end of the game, the teacher can go back and see which problems were most commonly missed and plan to review or reteach those concepts. Students can work independently, in pairs, or in teams to play these games.



Addition and Subtraction Knockout

Fluently adding and subtracting numbers is an important skill to master in the early grades. Instead of bringing out flash cards or bingo games, try creating a knockout game instead. In this game, the class divides into two teams and are given a set number of equations to solve. Each time a team correctly solves the equation, they earn a point. The team that collects the most points at the end of the round wins. This fast pace game provides opportunities for students to practice their math fluency skills and work together as a team. This game can be easily modified for upper grades to practice multiplication or division skills.

Investigations Games

These are my favorite types of strategic math games. These games involve the use of connecting cubes, dice, counters, Geoblocks, square tiles, cards, coins, and other tangible items. My districts' mathematics curriculum provides the resources and time for play-based learning through their student-led games in grades k-2.



These games align with the standards that are covered in each unit and spiral throughout the year, ensuring students get ample opportunities to practice.

Through MathElites, I learned about a free teacher resource that mimics some of the games used in Investigations. Theresa Wills, an assistant professor of mathematics education in the School of Education at George Mason University, has taken some of those games and adapted them to be played online for free. (www.theresawills.com) She provides video instructions on how to play each game. This website would be useful for teachers outside of Kingsport City Schools who would like to try out some of the Investigations games.

There are hundreds of math games to use in your classroom. The reason I chose to share these specifically is because they can easily be adapted to play in person, or through Google Meet / Zoom with your class.

We cannot predict the future, and unfortunately there could be a time where we need to prepare for a fully virtual classroom again. These games would be a great way to boost engagement and attendance in your virtual class meetings. If you've been skeptical about incorporating new technology or games into your lessons, I hope you'll try one of these suggestions in the future. ■

Congratulations to Comfort Akwaji-Anderson,
Cheryl Cantin, David Dai, and Grace Kelemanik



The newly elected Board members will begin their terms at the conclusion of the NCTM 2022 Annual Meeting and Exposition in October.



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The Power of Why

By Kristie Shelton

“Class, when we have 265, we can subtract 65 and get an answer of 200,” a former elementary school teacher once said. A student raised her hand and asked a very powerful question - “Why?” The student, who was eager to have her question

answered, waited patiently for that answer to come. It never did. After a pause, the teacher finally responded by saying, “Just because that is how it works.”

After receiving such a disappointing response, the child hesitated for a moment, reflected on the answer, and then replied, “Yes, I understand the answer is 200, and I know to take the bottom number from the top number. I just don’t understand why it works that way.”

The teacher then repeated the process of the algorithm the students had previously learned, but this only frustrated the inquisitive student more. The girl, with frustration in her voice,



muttered the statement, “I know how to work the problem; I just want to understand how it works.”

That student was me many years ago in elementary school. I was fortunate enough to be able to memorize the steps needed to work math problems, but I was the kid in school who always needed to understand why things worked the way they did. The most common response I received in school was “Because that is just how you do it.” The unexplained ways, the unanswered questions of how math worked led me to not

having the most positive outlook on the subject, as well as layers upon layers of frustration. I made the grades and passed the classes just fine, but math was on the bottom of my favorite list.

Years passed and I returned to college to pursue a degree in education. The first math class I had to tackle was the all-dreaded Probability and Statistics. My first initial thought was, "There is no reason that an elementary school teacher needs to take this class. Ridiculous!" Little did I know what was waiting in store.

The first day of class came and in walked the "professor." A man in khaki shorts, a flannel shirt, and hiking boots made his way to the front of the room. He pulls a 4-function calculator from his pocket, holds it up for everyone to see, and says, "This is the only tool you will need to pass this class." Inside I laughed to myself thinking this was absurd. After all, I had just forked out

a nice sum of money on a fancy TI-84. He continued the session by stressing the importance of memorizing the vocabulary as that would be essential to understanding. Vocabulary? In Math?!? I had never heard of such a thing, or if I did I was just too old to remember at this point.

Fast forward to the end of the semester. Not only did I pass the class, but I had developed an understanding (somewhat) of the math in the course and it was not just simply another series of learned algorithms. I still hadn't warmed up to math, but I wasn't hating it at that point either. I was on my way.

For my degree, I had to complete some elementary math methods courses. I rushed to the computer when it was time to register. I immediately saw the professor I had for Prob & Stat also taught the methods courses. I did well with him, so I eagerly

signed up for his class sessions. This was the best decision I could have made. The laid-back, chilled, 4-function-calculator-guy turned out to be the best thing that ever happened to me in math. He gave me the “Why?” I had been searching for since the beginning of my math education all the way back in elementary school. I was stunned when I discovered the numerator and denominator in a fraction had a reason - a purpose. Parts in a whole? The parts I need? Multiplying fractions is actually dividing them? You mean I don’t have to write an algorithm to solve a math problem? My eyes were opened and the answers I had searched for as a child were finally given to me. Needless to say, my outlook on math completely changed and I actually began to enjoy it, rather than just going through the motions.

I share this story to encourage you to always make sure that students understand “why” math works the way it does. I often tell my students, “If I had learned math this way when I was your age, I would have had a totally different outlook on math through school.” Teach them to think outside the box and look at it through a different set of lenses. Teach them it is okay to make mistakes, work out the process, and find a path that works for them. When the smoke clears the room and the students can finally see “why,” they will forever be changed the same way I was. Thank you, Professor Marks, for giving me the “power of why.” ■

Math and Literacy Integration

By Amiee Hutchins



show a deeper understanding and are able to better justify their work.

Another way that math and literacy can be combined is by having students utilize their speaking, listening, and writing skills during the math block. Students can use the speaking and listening skills they have learned in reading to engage in deep, meaningful discussion with peers and their teacher. They can utilize their writing skills to help justify their work and demonstrate a deeper understanding of math vocabulary

In conclusion, there are multiple ways that math and literacy can be incorporated together to better help students succeed. It does not always have to be one or the other. Why not take a student's love for reading and use that to help them develop a love for math as well? ■

There has always seemed to be a divide between math and literacy. You are either someone who is good at math, or you are good at reading. Some excel at both, but for the most part, it seems as if people are better at one or the other. What if we combined the two, though?

There are multiple ways that math and literacy can be combined. One of the clearly more obvious ways is by incorporating mentor texts during the math block. Read alouds are a great way to engage students and provide visuals of math concepts being taught in the classroom. The use of these read alouds are also a great way to build language and mathematical vocabulary.

Utilizing problem solving skills that students have learned through reading is also a great way to integrate literacy into math. Students can use what they already know about problem solving through comprehension skills they have learned in reading to help them solve a problem in math. When combining the two, they can



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