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Making Cultural Connections to Enhance Learning in Middle School Math Classrooms

Natalie Odom Pough Ed.D.

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Making Cultural Connections to Enhance Learning in Middle School Math Classrooms

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Abstract

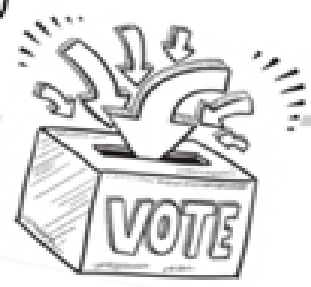
Dr. Natalie Odom Pough encourages innovative approaches to middle school math, fostering deep thinking and meaningful connections through thought-provoking questions. Drawing from her extensive teaching experience, she emphasizes the importance of early exposure to critical thinking skills, supporting lasting math retention and a stronger mathematical mindset among students.

Through my continuous evolution as an educator, I've learned how important it is to focus on the identity of the students I serve. Society has pushed mathematics into a corner where most learners stare at it and cringe. I want middle school students to see themselves as mathematicians. Moreover, I want them to see mathematics as the concept that helps move all other contents. Connecting what is happening in the world around us to the content being taught is one of the fastest ways to help students think critically, ask deep questions, and see the purpose of mathematics. Acknowledging the students and connecting them to the mathematics curriculum requires effort. It is the same effort science teachers make when a virus shuts down the country, and they teach students how viruses are spread and the importance of washing hands for at least 30 seconds. It takes effort, care, and content knowledge to do it well.

Similarly, social studies teachers do this when tying current events into their curriculum, including the Israel-Palestine conflict. English language arts teachers employ common measures to alter their curriculum when their school board bans books they have taught for years or when a current event sparks inquiries that deserve a book study to help students see what is happening around them. This is identity work - understanding who you teach and developing a curriculum that connects them with the content beyond the prescribed formula of standards and standardized tests. Identity work goes beyond race and gender. There is a focus on culture. Educators must understand that culture is more than the foods we eat. It is what brings us together - music, movies, sports, etc. Culture encompasses the latest dances, the trendy language being used, the popular television shows that interest students, and their wardrobes. More importantly, culture can embody one's racial background, and it can also be shared across races with a connection that brings a generation together. As educators seeking ways to improve mathematics teaching and learning for every student, their acknowledgment of their identities in middle school will shape who they become in adulthood.

Unit 1: Lesson 1

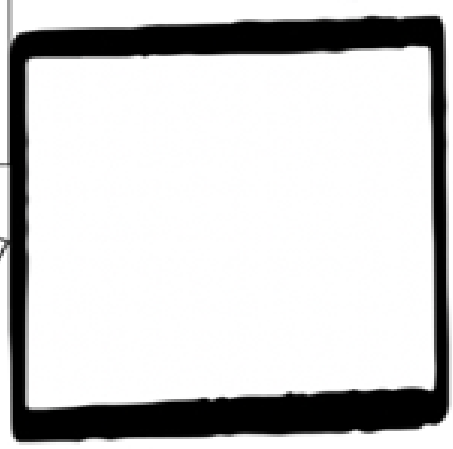
Adding and Subtracting Whole Numbers



2018 Election Data

Governor	Percentage	Votes	How many votes did Abrams lose to Kemp by?
Brian Kemp (REP)	50.22%	1,978,408	
Stacey Abrams (DEM)	48.83%	1,923,685	
Ted Metz (LIB)	0.95%	37,235	
How many Georgians voted in 2018's Gubernatorial election?			

Voter Turnout	
Ballots Cast	3,949,905
Registered Voters	6,428,581
How many Georgians DID NOT vote in the 2018 election?	



A couple of years ago, I used 2018 Georgia gubernatorial election results to teach an adding and subtracting whole numbers lesson to help students understand what it meant when people say, “The 2018 election was a *close* race.” I wanted students to see how close this election was and to focus on an underlying issue many Georgians realized after this election - many registered voters were not voting. During the lesson, which included parents observing classes on Parent Day, students could see how many registered voters did not vote and how their votes would have impacted the results. The mathematics behind this lesson pushed students to see how small a margin was and to understand that every vote counts. Throughout our discussion, students demonstrated their desire to vote and to begin to understand their civic duty. Moreover, students saw their current role as someone who can urge the adults in their lives to vote in every election.

During our discussion, the name of the late Congressman John Lewis, the former representative of the district where the school stands, was mentioned. In that moment, I witnessed adults and students alike making a profound connection between our mathematics lesson and a man who devoted his life to securing voting rights for all.

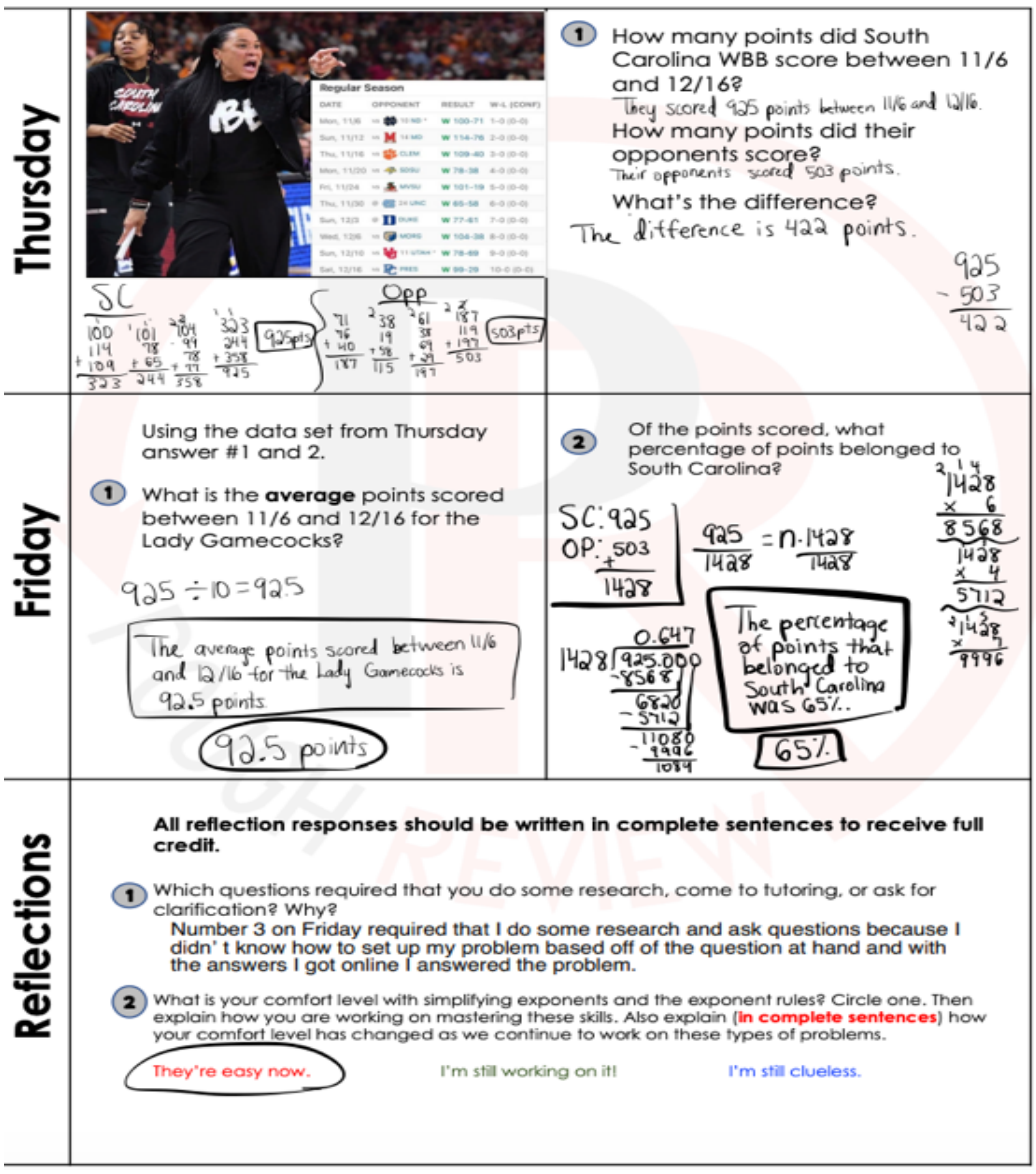
I watched children transform into high-level mathematicians who could humanize mathematical ideas and draw meaningful parallels to the history they have studied. One student reflected on how disappointed John Lewis must have been to see so many people in his home state choose not to vote. It was then that I realized: with more exploration and dialogue at this level, we are nurturing the thinkers and doers who will clearly envision and shape their futures.

There have been lessons where I presented my students with the ingredients list for Takis, a popular snack, and asked them to determine the percentage of natural ingredients. This activity resonated with my middle school students because many adults often express disgust for the snack and label it unhealthy. To develop critical thinkers, we must invite students to explore our perspectives and uncover the reasoning behind our conclusions.

Students created charts to illustrate their findings based on prior knowledge, analyzed the nutrition label and serving size, and engaged in thoughtful discussion. One student posed a particularly insightful question: “Although the ingredient list appears to be mostly from nature, why doesn’t the snack feel healthy?” This prompted a rich conversation about food processing and mass production. That moment reminded me that questioning and curiosity are at the heart of developing true critical thinkers.

Athletics is another topic that bridges generations. Even if someone isn’t a sports fan, certain moments in athletics leave lasting cultural imprints. Today’s students are witnessing the rise of women’s basketball, an experience that will connect them for years to come. I brought that cultural phenomenon into the mathematics classroom as well. Using a viral social media graphic featuring Dawn Staley, head coach of the University of South Carolina’s women’s basketball team, and her team’s remarkable record at the start of a recent season, I designed a series of math questions rooted in real data. Through this exploration, students not only applied mathematical reasoning but also learned about careers in Sports Information. The lesson was multifaceted, engaging, and a clear success.

An example of one of my students’ work showcases how she processed the problems (see below), noting that there was an error. While correcting this, I simply highlighted that she had made a mistake and asked her to review it through the lens of an error analyst. Her mathematics was correct—the error was not in computation, but in transferring the results from one part to the next. She was able to identify her mistake through thoughtful reflection on each question, demonstrating a level of reasoning and perseverance that exceeds typical middle school expectations.



In the middle grades, culture and connection bring learning to life. Helping students understand that every decision they make is connected to another is both a life lesson and a mathematical one. By intentionally embedding culture, current events, and introductory data science into the scope and sequence, we can create opportunities for students to engage with mathematics in meaningful, relevant ways. Many of these ideas stem from information I gather through NPR, social media, podcasts, and other news sources, which help me connect classroom learning to the world students experience daily. As a result, they are able to communicate their understanding beyond the traditional unit assessment and, more importantly, recognize the deep connections between their daily lives and the mathematics they learn.

Dr. Natalie Odom Pough is a limited-term assistant professor of mathematics education at Georgia State University. She dedicates her work to the next generation of thinkers and doers who will see the need to change the world. Dr. Pough was awarded the Presidential Award for Excellence in Mathematics and Science Teaching and has been recognized as a Champion of Education for ASCD and The Worthy Educator.

Legacy is the official journal of The Worthy Educator, elevating the good work being done by leaders in education who are working to change the narrative on the profession and actively plan for impact that transforms its future to serve the needs of a diverse, decentralized, global society that is inclusive, equitable and open to all people as next generations adapt, evolve and contribute by solving problems and creating solutions that meet the needs of a world we have yet to envision.

Submissions are accepted on a rolling basis from educators who are implementing new and innovative approaches in the classroom and at the building and district levels. Information on specifications and instructions to submit can be found online at theworhtyeducator.com/journal.