

MTIP Nugget

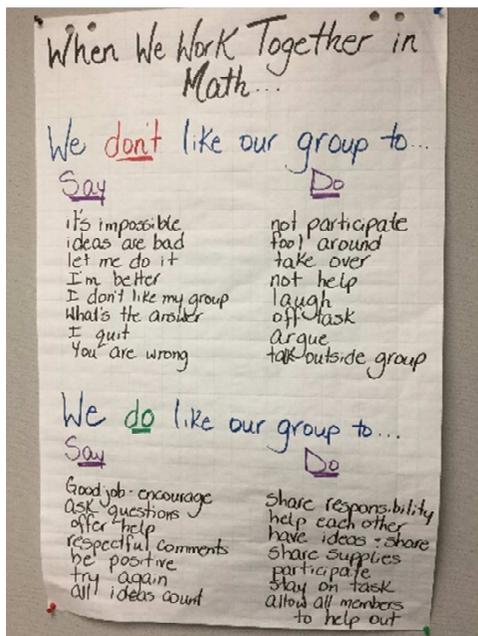
Let's Talk Numbers

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Our school year started with the realization that something was going to have to change. The strategies and teaching tools that we had in our back pockets were not as successful with the groups of students in our classrooms. We noticed that there were gaps in key understanding with place value, and gaps in ability to communicate mathematical understanding visually and verbally. Thus, our three initial quests were:

- How can I build resilience and a positive mindset in my students so that all students can be successful problem solvers?
- How can I use conversations in Math class to enrich problem solving?
- How can I develop and foster meaningful conversations in math class that lead to cooperative and, gradually, independent authentic learning?

We started with meeting students at varying entrance levels through open-ended problem solving. Students worked in groups, using manipulatives to solve open-ended problems related to the unit outcomes. We quickly came to notice that our students lacked the ability to communicate their thinking verbally and visually.

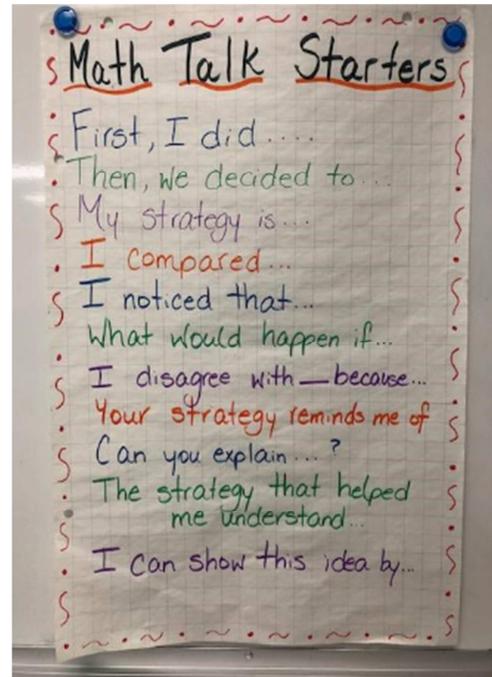


We continued using open-ended problems to support key understanding of unit outcomes, however some of us limited the students to using only manipulatives or other visual representations. This was difficult for some of the students. They were in the habit of looking for key words, and using those key words to create an equation to solve the problem. This approach demonstrated understanding; however, the students struggled to explain why they were able to solve the problem in their chosen way. Together the class created an anchor chart of possible ways to solve a problem visually, and the classroom teacher provided them with several different tools to solve problems visually (base ten blocks, money, technology, rulers, bingo chips). The students' ability to use visual representations increased dramatically. Exciting! The struggle now was how to verbally explain these visual representations.

The next step was to increase verbal communication through Number Talks in our classrooms. Initially the students sat in their desks and participated in solving various mathematical equations. When we felt the students understood a particular strategy, we gave them an exit slip and discovered that we were wrong. They were struggling. One teacher set up her I-Pad at the back of the room and recorded her next Number Talk. The recording showed

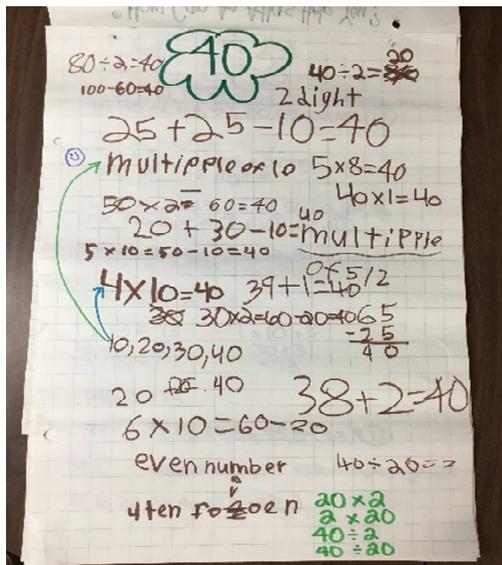
the large amount of fidgeting and the lack of focus on what was being discussed and written on the board; this problem was noted in all classrooms. It was suggested that the students could sit on the floor at the front of the room for a Number talk, which raised several questions. Now can the classroom be arranged so there was space? Would be too much time to have the students move desks for a quick number talk? How were the children going to respond to sitting on the floor, and was this going to create more issues with behavior?

With huge hesitation, one teacher tried it. The desks were re-arranged into a horse shoe, so that there was always space in front of the board. Students were invited to sit on the floor and complete a number talk together, or be taught the key understandings of the concept they were learning. This allowed the students to make connections in a focused space.

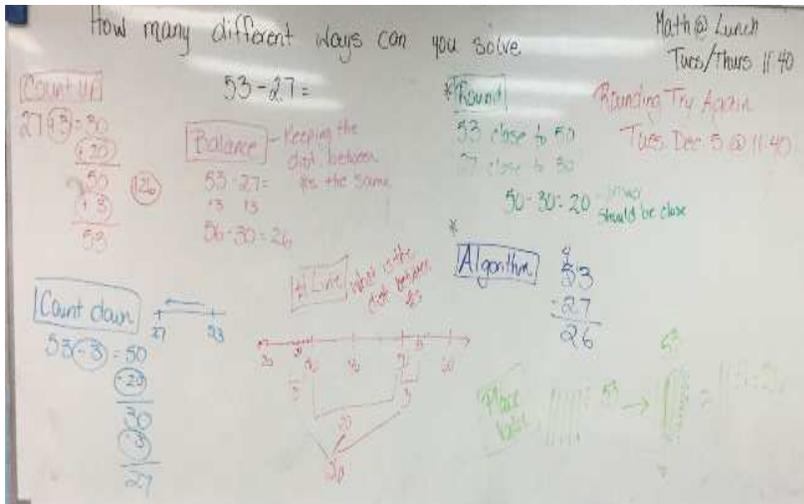


We also implemented a hand signal wait time strategy: raise a thumb if students had an answer or solution, two fingers if they had two solutions etc. This allowed students time to think without being overwhelmed by some students quickly raising their hands in the air. As the students solved the question, their thinking (correct and incorrect) was recorded on the board. Many students continued to struggle with communicating their understanding and thinking.

As a class, sentence starters were created and recorded on anchor charts posted in the classrooms. These sentence starters were used to create dialogue. The students had an opportunity to agree or disagree with each other's thinking, being able to have the reasoning to back up their thoughts.



The growth from the start of the year was noticeable. In October, one teacher recalls putting the number 50 on chart paper and silence fell over the room. Another teacher put a subtraction question on the board, and there were crickets. Not a single student had a strategy or was willing to share a strategy for how to get to the answer. By March and April, Number Talks in the classroom demonstrated student thinking using vocabulary such as, “multiple” “odd” “even” and “split” along with number sentences in addition, subtraction, multiplication, and division, all of which were not heard at the start of the year. The students had developed strategies, were able to communicate multiple strategies to solve a variety of

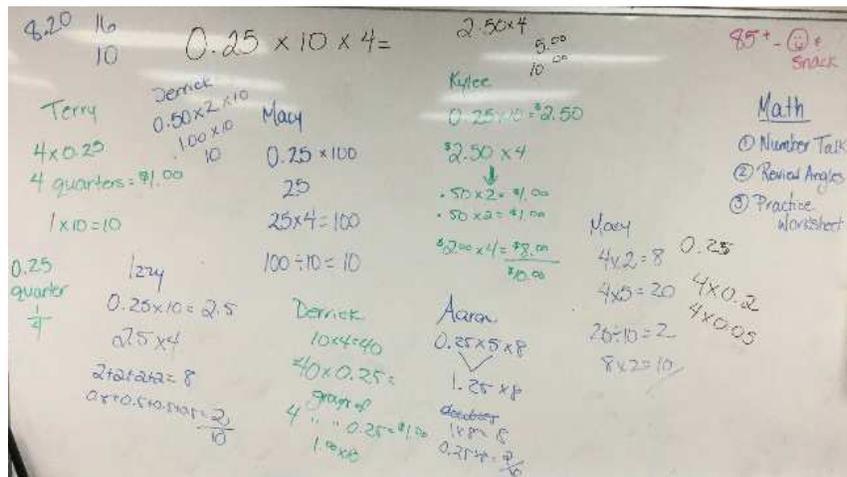


problems, and had the ability to agree or disagree with their peers.

“At the beginning of the year, I would look at a problem and just think about what the steps were to solve it. Now, when I look at the problem, I understand what it means and I understand how to solve it. I am not just going through the steps.” (Grade 6 student)

“When I started explaining questions, I would just use an algorithm. Now I can use mathematical language to explain it.” (Grade 6 student)

Our initial quests evolved as the year progressed. We all realized that there wasn't one solution to our students' struggles. As we noticed issues in learning, we adapted our quest and adapted our teaching to meet the students where they were at. Before being able to facilitate dialogue, we needed to build visual skills



and confidence in place value through hands-on learning and open-ended problem solving. Once students had skills to visualize their thinking, we were able to begin to enhance and support the conversations in the classroom. As a group, there has been marked improvement in students' ability to reason visually and verbally use appropriate mathematical language.

We are definitely not in a perfect place. There is always room for growth and improvement. Although each of our individual quests varied and often led us in different directions, our overall focus was communicating mathematical understanding. Deciding, planning, adapting and reflecting on our own teaching practices is critical to both our own growth as educators, as well as the development of best practices to support student success. This process allowed us the rare time to reflect with our colleagues and more importantly a reminder to stop and reflect on our own understanding and direction. Our formal quests may have come to an end; however, our personal quests will continue to develop and lead us on new and exciting explorations.