

Cut to the Chace

A summary of the ideas that intrigued me this week (3-4-23)

Titles and links to the works I am summarizing:

- 1) [Daily activities to focus on the positive](#)
- 2) [Modeling fraction division with online manipulatives](#)
- 3) In Depth: Using questions and sentence frames to highlight students' problem-solving strategies [From the book, "[Teaching for Thinking](#)" Kelemanik and Lucenta].

Below each summary is a commentary on how this work connects to equity* in mathematics and how I have applied these ideas at my school. Please see "About Cut to the Chace" at the end of the document for further details.

1. Summary of "Daily activities to focus on the positive": On February 27, @Mr_Rablin [tweeted](#), "Earlier this year, I was pretty ready to be done teaching. That has since changed. The difference is that, though the problems still exist, I've also become intentional about noticing the good." He then posted a "Noticing the Good" March challenge that includes a daily activity to help educators notice the positive things they experience every day (see Tweet for details).

Connection to Equity: A positivity challenge adapted to students would align with the equity practice of understanding your students well ("U" in the [ICUCARE equity framework](#), citation at the end of this document). If the challenge was adopted in the classroom, the educator could incorporate ideas from the students' responses into future lessons to make the lessons more culturally relevant.

School Connection: I emailed the calendar to the faculty and staff at my school and then created a Teams Channel for everyone to post their daily responses. A teacher sent the following message on the second day of the challenge, "Hi ya'll, This activity is inspiring. Give it a try. I am not one to keep up with motivational challenges, but this one feels like a revival...I am all in. Thank you, Chace. I appreciate it.". The following day more than half the staff shared their responses. This has inspired me to develop a new positivity challenge for April!

2. Summary of "Modeling fraction division with online manipulatives": On February 20, @TimBrzezinski [tweeted](#) a video demonstrating how to use the free manipulatives on [polypad](#) to "empower [students] to explore & divide fractions conceptually." The video modeled $\frac{3}{4} \div \frac{4}{11}$ by using fraction bars to show how many " $\frac{4}{11}$ s" fit into $\frac{3}{4}$.

Connection to Equity: Using manipulatives to demonstrate fractional division aligns to the equity practice of "Going deep with mathematics" because it supports students ability to analyze and justify their solutions (from the "[Five equity-based practices](#)", citation at the end of this document). For example, a mini activity around fraction division where students must create their own fraction division word problems and justify their solutions would create opportunities for students to demonstrate their knowledge using multiple strategies.

School Connection: Next week, I will present the following problem to my students: "You and some friends want to make bracelets. You have $\frac{3}{4}$ of a foot of string. Each bracelet requires $\frac{4}{11}$ of a foot of string. About how many bracelets can you make? I will then ask students to use online manipulatives to demonstrate how they might

model this situation and find an exact answer. Next, I will have them create their own stories and representations to share. Additionally, as a secondary math teacher, I do not have many physical manipulatives. The tweet reminded me to take advantage of all the free virtual manipulatives available online!

3. In Depth Summary of “Using questions and sentence frames to highlight students’ problem-solving strategies”: In chapter 1 of their book [“Teaching for Thinking”](#) Kelemanik and Lucenta discuss three shifts to teachers’ instructional practices that support greater mathematical thinking and reasoning. This summary will highlight the “Focus on Thinking” shift (pp.6-10).

The authors summarize the importance of focusing on thinking with the following quote, “We need to spend more class time focusing on the thinking instead of the answers if our students are to become powerful math thinkers... To develop math thinking, we need to focus attention and classroom conversation where the thinking lives; namely, in what you pay attention to, the questions you ask yourself, and the subsequent actions you take” (p. 7). To support students in developing these skills, the authors suggest the following steps. First, launch the lesson with a visual and an [“ask yourself question”](#) (e.g., “How can I represent this situation so that I can see the quantities and relationships?”) related to the visual. After some independent think time to consider the question, provide students with the sentence frame **“I noticed _____ so I looked for _____”** to use when sharing their ideas with a partner. Once the partners have had time to discuss their ideas, their findings should be shared out in a class discussion.

These “ask yourself questions” along with the sentence frame help students notice what might be mathematically important in a problem before getting started, thus providing an entry point for all students without the teacher stepping in to reword the problem (p. 9). These questions can also be used to support students’ productive struggle because they provide thinking tips rather than hinting at the solution. [The “ask yourself questions” are covered more deeply in the authors’ first book [“Routines for Reasoning”](#) you can find their podcast summary of the book (with transcript) [here](#).]

When discussing solutions, the sentence frame can be altered to read, **“We noticed _____ so we _____”** to get students in the habit of sharing their strategies before their solution. Other students should revoice these strategies by using the frame **“They noticed _____ so they _____”** because “knowing a classmate’s answer or what they did will not help a student on future math problems, but learning what others are noticing and how that helps them make sense of and approach a problem will” (p. 9).

When closing the lesson, the authors suggest using sentence frames such as, **“When interpreting _____, I learned to pay attention to _____,” “When connecting representations I learned to ask myself _____,”** and **“A new mathematical connection I made was _____”** to facilitate meta-reflection that will help students interpret new mathematical concepts in the future (pp.9-10). This is important because, “if we are going to teach students how to reason and think mathematically, we have to name the thinking and not just assume students are learning to think mathematically because they worked on a cognitively demanding math task” (p. 10).

In concluding this section, the authors note that when teachers ask students to highlight their thinking, and students attend to their peers’ thinking, the students will develop strategies to help them make sense of future math problems. This will help students “become confident in their math doing and capable of applying the math they know to problems in their world (p.10).

You can find a podcast (with transcript) summarizing the book [“Teaching for Thinking”](#) on the authors’ website [here](#). Their [website](#) also provides many additional resources to support thinking and reasoning.

Connection to Equity: As the authors state, “Focusing on student thinking sends the message to students that their ideas have merit, and students start to see themselves as capable mathematicians” (p. 10). This aligns with the equity practice of “challenge spaces of marginality” because the sentence frames “encourage student-to-student interaction and broad-based participation” (from the [“Five equity-based practices”](#)). Furthermore, using these sentence frames and ask yourself questions allow students to understand the problem with less teacher support.

This aligns with “releasing control” (“R” in the [ICUCARE equity framework](#)) which places a focus on student sensemaking as an equitable practice.

School Connection: I have used the “notice or wonder” strategy for years and incorporating these sentence frames seemed like a natural next step. That is, the sentence frames present a way for students to take their notices and wonders and use them not only to better understand the problem, but to also develop concrete solution strategies over time. For these reasons, I used the sentence frames in the launch and closing during a 7th grade lesson on integers this week.

During the launch, I presented students with a table recording a climber’s beginning and final elevation in two different columns. I ask students to think about how we could represent the difference between the final and beginning elevation and then share their ideas with the sentence frame “**I noticed _____ so I looked for _____**”. At least during this initial attempt, my students did not share any strategies. I heard responses such as, “I noticed the first column only had two different numbers, so I looked to see how many different numbers were in the second column.” While true, this does not get at a useful strategy for finding the difference between two elevations. However, I had better luck with using “**We noticed _____ so we _____**” and “**They noticed _____ so they _____**” in the closing. One group said, “We noticed that finding the change was easier when we had a picture, so we put the numbers [from each column] on a number line that went up and down like the thermometers.” I also felt the students were rephrasing each other’s work with more detail when they used the “**They noticed _____ so they _____**” sentence frame compared to when I just asked them to restate a peer’s thinking. Next time, I will only use the frames in the closing because I think it is easier for students to understand how to share a strategy once they have an answer. However, I will record their responses over several days and then have a class discussion about how we could use some of these ideas in the launch. I think this will lead to more meaningful strategies being shared at the beginning of the activity.

About “Cut to the Chace”

I started a [website](#) as a place where Springfield Public Schools’ math educators could collaborate and share ideas around equitable math practices*. While I still think the website is important, I realized something else would be needed to jump start engagement. I decided that a weekly newsletter containing summaries of equitable instructional strategies (and my initial experience implementing them) would model a way to share ideas. I hope this less formal setting will encourage other educators to share their experiences and resources which can then be curated and posted on the website. The more voices we have sharing positive experiences implementing equity-based practices in SPS classrooms, the better chance we have of creating a positive mathematics experience for all our students!

*As defined by Pamala Seda’s “[ICUCARE Equity Framework](#)” and the “[Five Equity-Based Practices in Mathematics Classrooms](#)” from the book, “The Impact of Identity in K-8 Mathematics Learning and Teaching” (see citations below).

Aguirre, J. M., Mayfield-Ingram, K., & Martin, D. B. (2013). “Part 2 Rethinking Equity-Based Practices”. In *The Impact of Identity in K-8 Mathematics Learning and Teaching: Rethinking Equity-Based Practices*. Reston VA, USA: The National Council of Teachers of Mathematics, Inc.. Retrieved Feb 25, 2023, from <https://pubs.nctm.org/view/book/9780873538565/pt02.xml>

Seda, P. (2008). *The ICUCARE Equity Framework*. sedaeducationalconsulting. Retrieved February 25, 2023, from <https://www.sedaeducationalconsulting.com/icucare>