

Random Thoughts on Teaching Future Elementary Teachers with Mastery Grading

By Dr. Mary Reeves, September 2024

By reducing the stress and taking away the time limitations, students were able to give me more nuanced and thoughtful explanations. This both demonstrated their deeper learning, it revealed some things about my teaching that were a surprise and made me see what I do in class through fresh eyes. An example of this is the student who submitted her work for addition as compensation (HH, spring 2024). She said that “In Compensation Addition, you add to the smaller number to make it become the next hundreds place.” What struck me as a teacher is that EITHER number can be altered to make it “easier” – this is not limited to the second number. For this assignment, the student added 24 to 176 to make it 200 – an easy number to add to 268. But she could have added 32 to 268 to make it 300, and added that to 176, BUT IN ALL OF MY EXAMPLES IN CLASS, WE CHANGED THE SECOND NUMBER! I do not know how many semesters I might have done that unconsciously, but I will make sure that I demonstrate changing EITHER number in future semesters.

For student-invented subtraction, a different student (KR, Spring 2024) submitted this, a strategy I’ve never seen before:

431
-157
384
-11
274

Solving from L → R.
4-1=3, for 3-5 I can borrow "1"
from my "3" from 4-1. This will
turn into 13-5. We have to do the
same thing we did to our "3" & borrow
another 1 from our "8" because we
can't do 1-7. This will turn into 11-7.
Now we subtract our answer with
the 1's that we borrowed to get our
final answer!

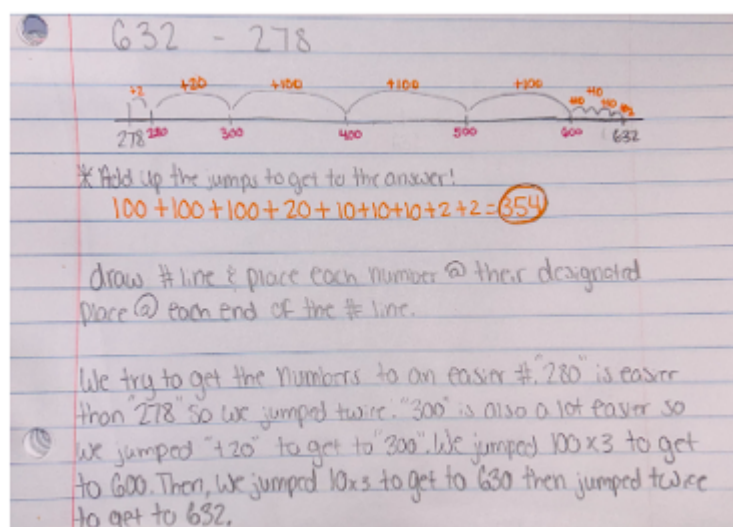
This has elements of three other methods that we discussed, combined to create something entirely new. There are traces of what I call the international method, partial differences, and compensation. This is fabulous!

It is hard to overstate the change in my experiences during finals week, spending time with students to improve their knowledge and understanding of mathematics instead of stressing about whether this or that student will accumulate enough “points” to pass the course. The questions students are asking are very different – they are focused on actually learning the material rather than wanting to know “if this will be good enough to get all the points” or “is this how you want me to do it on the test?” We are all keeping our eyes on the calendar now that the semester is almost over and grades must be submitted soon, but we are thinking about days, not minutes (like we used to do for in-class exams). And there have been some important

opportunities for me to emphasize to students who perceive themselves as “weak in math” that their work is of very high quality, surpassing my own expectations for what they could do. Several have told me that this was the first time they ever felt “special” in a math class.

I know I have made mistakes this semester, but that is to be expected when trying something so radically different in teaching. I will learn from these mistakes so that I can make new ones next semester.

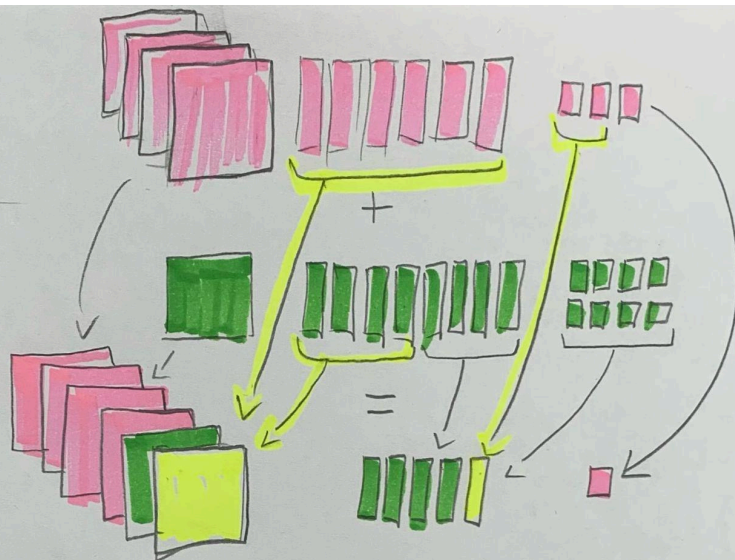
Here I am, 14 hours from the deadline for submitting grades, and one of my students is still learning math! She hasn’t quit and just “taken her C,” she’s still working to demonstrate mastery. We are using email as a texting surrogate, and I’m asking leading questions and she’s giving the correct answers. She still isn’t as confident as I would like, but she is persistent, so she is still learning. I think this counts as a win!



Once again, a student (KR, Spring 2024) creates her own way to show her thinking, using ideas from the class that were not explicitly demonstrated by me. She combines multiple techniques that fit with her way of thinking and reasoning.

Another student (ID, Spring 2024) drew the diagram below in class to capture what she did using physical manipulatives.

$$\begin{array}{r}
 463 \\
 + 188 \\
 \hline
 651
 \end{array}$$



Partial Sums

$$\begin{array}{r}
 463 \\
 + 188 \\
 \hline
 \end{array}$$

500

$$400 + 100$$

140

$$60 + 80$$

11

$$3 + 8$$

651

Sharing

$$\begin{array}{r}
 463 - 12 = 451 \\
 + 188 + 12 = 200 \\
 \hline
 651
 \end{array}$$