Building Conceptual Understanding with Manipulatives

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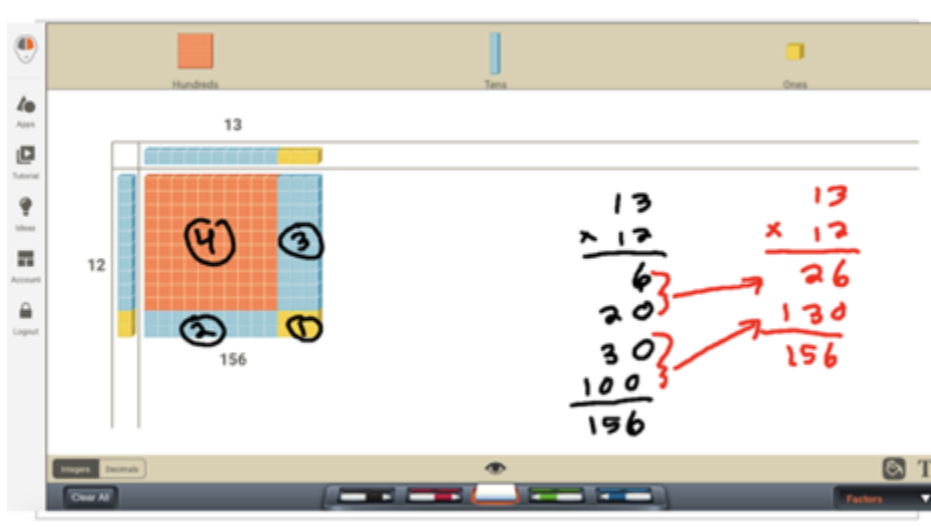kdyema@mattawanschools.org

Teaching mathematics is so much fun! There is so much to learn as a teacher to help ensure success for each and every student. Many of us grew up in a time where math was taught as rule memorization and we now teach in a time where understanding is so much more valued. This means we can't continue to teach the way we were taught!

Building conceptual understanding is crucial for the mathematical development of our students. One way to build such an understanding is through the use of manipulatives, such as Base Ten Blocks, Color Tiles, Algebra Tiles, and many more.

Consider, for example, multiplying 2 two-digit numbers. I remember memorizing the steps for the algorithm (but having no clue why it worked!). We "learned" how to do the procedure then by practicing for multiple days. Contrast that to using Base Ten Blocks to develop a deep conceptual understanding. Students can build a rectangular array using the multiplication problem as the length and width. The answer then is the blocks in the array. It usually doesn't take long, and they recognize there are four "sections" to their array each time. We can use this, and with some questioning, lead to the partial products algorithm, which capitalizes on place value – and unfortunately, drives many of our students' parents crazy! But then, we can combine steps from the partial products and lead to the standard algorithm.

Below is an example of using a rectangular array to find the product of 13 and 12. The image is created using www.brainingcamp.com a site that gives teachers access to digital manipulatives (clocks, base-ten blocks, and

fractions tiles to name a few). Due to COVID-19, teachers can request free access until June 30, 2020.

There are many other examples of using manipulatives to develop that rich, deep conceptual understanding at so many different grade levels. We need to take advantage of opportunities to learn such ways to help ensure that each and every student can learn (and enjoy) mathematics!