“Rethinking How We Use Calculators” a blog post by Jose Vilson MAY 16, 2013

1) If ever you come across a set of math teachers, whether at a common planning meeting or a bar during happy hour, bring up the conversation of calculators and watch the sparks fly. The arguments for and against calculators have the spirited vigor of a Red Sox vs. Yankees game without the animus. One side argues for the use of efficient and available technology in the classroom, while the other argues for numeracy and fluency to the highest order. In other words, are you old school or new school?

Two Schools of Thought

2. The old school suggests that, in order to develop a rich sense of numbers and fluency, we shouldn't allow students to use calculators. In a world over-equipped with technology tools, students must be able to do operations without the calculator there. In this school of thought, calculators strip students of curiosity about how numbers work because they can arrive at the answer just by pressing a few buttons, not by going through the long-established procedure of finding the answer. Calculators already spit out everything from long multiplication and division to graphs and solutions to simultaneous equations. The old school crowd isn't completely anti-technology; many of them stand by The Geometer's Sketchpad. They just wouldn't want all the mysteries and intricacies of math unlocked so quickly.

3. The new school suggests that we take a different outlook on the calculator issue. If we can so readily solve problems with a calculator, then why not give one to our students? The old way of writing out the multiplication table in both a table and list form is antiquated and tiresome. The calculator is also much more efficient, reducing the amount of time one spends on a problem. For instance, imagine trying to divide a seven digit number by a two digit number higher than 12? Such a task seems tedious when a calculator can do it in a fraction of the time. Even operations with fractions can be simplified with calculators, so finding things like the least common denominator or remainders feels pointless if the screen just told the student the answer.

4. My response to this one lies somewhere in the middle. I'm not totally against calculators. I use them frequently enough when creating answer keys for my exams -- after I take time to do the problems myself. I use them when working on my taxes, and I've used one when trying to get a new couch for my mom to fit in her apartment. (Thank you, Pythagorean Theorem!)

The Right Tool Used the Right Way

5. Where I start siding with the old school mathematicians is in this: how do we know that the calculator is telling us the truth? Numbers don't lie, but humans make meaning of these numbers and hope to ascertain how they apply in the context given. If we rely solely on calculators without giving much thought to the number we've put down, or simply assuming the calculator is always right, then we end up with everything from wrong answers to the financial collapse of 2008.

6. Calculators are tools to help solve problems, not the solver of the problem itself. Our students need to develop a sense of numeracy that allows them to estimate the distance between two items, for example. We can't underestimate the usefulness of looking at numbers and making quick calculations by comparing those numbers without having to pull out a smartphone.

7. The calculations we make on the fly matter more than the ones we make in math or science class, yet these classes are where students get the most explicit reasons for using them. In larger math problems, I can see the usefulness of a calculator. For instance, when finding the differences between planets in scientific notation, we shouldn't have to plug away at doing operations to the first factors. However, if we insert the notation wrong in our calculator, we could end up with a number bigger than we bargained for.

8. We need to think about the way we use calculators, or any piece of technology. Assuming that the tool is doing exactly what we're asking it to do -- or actually has the answer to the question we've asked -- is a dangerous proposition for the non-thinker. We need a healthy balance of working within the number system and doing more complex problems. We need to let calculators serve their purpose in moderation.

What do you think?