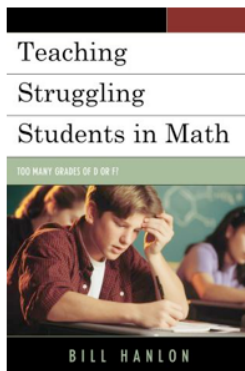


Hanlonmath Newsletter

A newsletter for math teachers and administrators
who work with struggling students

Common Sense Strategies that Work!

Thinking Aloud To Increase Student Understanding



Math is about decision-making. A strategy we recommend to teachers is to “think aloud” so students understand the “why” behind decisions.

To clarify what thinking aloud means, let’s look at a few examples of the decisions teachers routinely make when computing or solving problems. To add fractions, we first find a common denominator. But, how do we find the common denominator? By A) writing multiples of the denominators, B) multiplying the denominators, C) find the LCM, or D) using the Reducing Method?

The answer depends on the problem. Teachers instantaneously make decisions in their head so the work appears easy. Students just don’t have that experience. So, we recommend that teachers slow their thinking, think aloud so students know a decision was actually made and why, then continue with the problem continuing to think aloud as they compute. After I teach these methods, I generally tell students my preferences: that I either multiply the denominators if I know their product or use the Reducing Method when the denominators are larger composite denominators.

In first year algebra, students are asked to solve systems of equations by graphing, substitution or linear combination. Again, when teachers choose a method to solve a particular system, it looks simple. But, students can make the problem a lot more difficult by not choosing the best method for that specific problem. Again, this can be addressed if teachers would think aloud and explain why they chose a particular method and then doing the computations aloud as well.

Another example applies in solving quadratic equations, students are taught 4 methods. A) Using the Zero Product Property, B) The $x^2 = n$ method, C) Completing the Square, or D) the Quadratic Formula. By thinking aloud,

students would realize math is about decision-making based on information or data provided. So, when confronted with a problem, the teacher should think aloud to determine the best route to solve the problem and why that choice was better than the other possible methods. We need to instill in students that if they think first, they might find a much simpler way of doing the problem that makes math a lot easier.

It's difficult for teachers to slow down their thinking to ensure students understand their decision-making. It takes pre-planning. Being able to think aloud is almost impossible for teachers who have not planned ahead of time.

Using the “think aloud” strategy with linkages and using simple straightforward examples, teachers can also address computational skills so students can see this think first strategy allows them to work more efficiently. Too many students’ first instinct is to reach for the calculator. But, computing mentally, with practice, can be quicker.

For instance, $360 - 72$, could be thought of as $360 - 60 - 10 - 2 = 288$ in their head – mental math.

Another example, 25×32 could be seen as $25 \times 30 + 25 \times 2 = 750 + 50 = 800$ using the Distributive Property

16×35 could be seen as $8 \times 70 = 560$ using the Multiply-Divide (Half-Double or Multiplying by 1) strategy teachers often employ when factoring polynomials. Not only do these strategies make computation easier, they also review, reinforce and support the Properties of Real Numbers.

Showing students that making good decisions upfront by thinking aloud makes math computations and manipulations a lot easier for students. This simple strategy will help make students more self confident knowing the “why” behind decisions, resulting in increased math achievement.

Bill Hanlon, former Director of the Southern Nevada Regional Professional Development Program, is a noted speaker, an author, educator, consultant and coach for schools, and is a national presenter for organizations such as AASA, ASCD, ALAS, NMSA, NASSP, NSBA, and NCTM. He was the coordinator of Clark County School District's Math/Science Institute and was also responsible for K-12 math audits. He served as vice president of the Nevada State Board of Education, Regional Director of the National Association of State Boards of Education (NASBE) and as a member of the National Council for Accreditation of Teacher Education (NCATE) States Partnership Board. He also hosted a television series, "Algebra, *you can do it!*" on PBS Las Vegas.