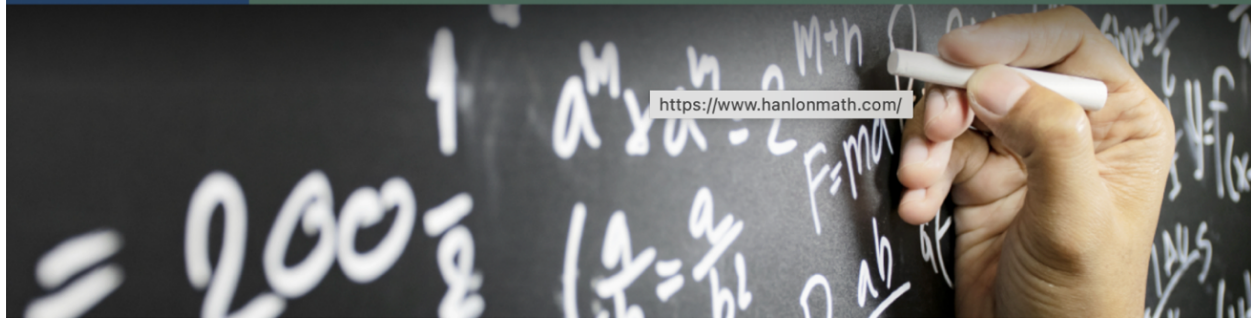




MATHEMATICAL SYSTEMS, INC.

Math Content Based Professional Development



Building Success on Success in Mathematics based on a What Works is Work philosophy

The Pontius Pilot system, that is, buying a program, washing your hands of responsibility for improving school achievement, then saying; “Look what I have done”, doesn’t work. My response to that is, yes, “Look what you have done” in a completely different tone in my voice.

Once that notion is discarded, district personnel have to be clear on their own knowledge, understandings and beliefs. First and foremost, a very large percent of teachers report their evaluations have little or no impact on their instruction. To address that, teacher evaluations should be primarily based on math content strategies as primary and instructional strategies as secondary. Simply stated, you can’t increase math proficiency or achievement unless you actually discuss math.

That doing well in math is not about being smart, it’s about knowing stuff. That math is not like other subjects, it’s dependent up prior knowledge, sequencing and mastery. And, the greatest differences between math taught in elementary to math taught in high school are vocabulary, notation, and the pattern development that makes math so much easier to learn, do, and remember.

With that said, a decision must be made to decide to *either expect more and get more* or continue to *accept less and get less* from everyone; superintendents, school administrators, teachers and students. And following up on that, district administrators need to have a clear understanding that they *cannot expect what they do not inspect*.

So, in a nutshell, the nation has, and is, experiencing a math teacher shortage, requirements have been lowered and we have administrators who know less math than the teachers they are observing and evaluating them and supposedly helping them become better teachers – that’s sad.

To build success on success, math teachers must be very clear on their expectations in preparation; that is what they expect their students to know, recognize, understand, communicate and be able to do.

Based on that, in their preparation, teachers need to identify the conceptual development or linkages needed to introduce the new learning in familiar terms which makes students more comfortable in their new learning. Those linkages also allow teachers an opportunity to review, reinforce or address student deficiencies as they teach their assigned curriculum. That’s followed by the need to identify simple, straight-forward examples that work, that clarify, that do not distract students with needless arithmetic with initial instruction. They then have to identify repeated scaffolding examples to reach to grade level expectations. And finally create a parallel constructed practice test so they know, students know and parents know what to expect all before instruction begins on that unit.

I recommend a test made of three parts; The first part are on the first page of the test should be made up on questions that contain no math computation or manipulation - I refer to those as 3-star questions - but is information students “need to know” to be successful. They include, formulas, strategies, procedures, definitions, etc. that can be used to do regular type questions on the second part of the test (2-star questions). As an example, a 3-star question might be write the formula for midpoint. An associated 2-star question would be: Find the midpoint of the segment that connects (2, 3) and (12, 14). The simple fact is, if students have not memorized the midpoint formula, the probability of getting the problem correct is pretty low.

The third part of the test is made up of performance based questions, questions that come from the ACT, SAT, PARCC or SBAC. That ensures students are experiencing how that information may be questioned on those high stakes state and national tests.

To increase student success, we know what *works is work*. So, teachers should begin class every day with a quick crisp purposeful review (QCPR) of those 3-star questions identified in preparation and on the first page of a test. That repetition increases familiarity, comfort levels, memory, automaticity, and provides opportunities to identify nuances that will impact their decision making in approaching problems. That is, the daily QCPR is the lynchpin that sets the students up for success on that unit/chapter test. And, with six to eight tests given per semester, those first pages will be great one page reviews for those high stakes tests with two sets of practice problems.

Moving on, teachers should be very prescriptive and directive with student note taking, telling them what to write, where to write leaving white space avoiding visual over load and identifying information using the star system with the types of questions to be tested.

Continuing, homework should support and reflect the preparation, instruction and notes. That is homework should consist of a reading assignment, 3-star questions that are part of the daily QCPR and are on the first page of the test, and regular problems like the problems done in class, exercises and guided practice type problems.

And, just like sports coaches practice, preparing for a game, teachers should do the same. That is, two days before the assessment, go over the parallel constructed practice test two days before the real test – one question at a time. That is, the students do the first problem, then the teacher does it, the same with all the questions on the test. If the teacher sees students experiencing difficulty or sees hesitation, then the next day those questions can be reviewed.

Parental involvement helps tremendously. The Marketing Plan, a communication plan, available upon request, increases parental support and results in increased student accountability.

Let's be clear, school administrators supervising and evaluating teachers with little or no knowledge or understanding of math is a major issue negatively impacting student performance. If we don't actually talk about math, we are not going to improve proficiency or achievement levels. And understanding that simple axiom, administrators *should not expect what they don't inspect*.

Building success on success requires students experience success. To have that occur, school superintendents, district administrators, school administrators and teachers need to adopt one single consistent message that is often repeated using math content strategies that support these strategies.

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