How Math Must Assess

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1. INTRODUCTION

I'm writing this as much for myself as for the benefit of my colleagues. If I ever leave teaching or lose my mind, this document will be the only record of the best professional year I ever had -- the year that assessment changed, and then changed everything for me.

During my student teaching year, I taught like I had been taught. Who could blame me? I also assessed like I had been assessed, which meant a large unit test every couple of weeks, the grades of which I would inflate if the class average was too low. If a student missed the test I would schedule a makeup during lunch, before school, or elsewhere on my own time.

It only took me that year to see how much this system fails our students. However, it took me another two years to find the system that works.

2. SHORTCOMINGS OF THE CLASSIC MODEL

Under the classic testing model, I might have this sequence of grades in my book:

Greg Mays - Progress Report

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Chapter 6 Test   -   63%
Chapter 7 Test   -   87%
Chapter 8 Test   -   58%
Midterm          -   42%
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Forensically, I can tell a lot from this student profile. From his midterm score, I know Greg needs focused remediation. When I remediate, I also know not to waste a lot of time in Chapter 7. Chapters 6 and 8 need help, obviously, but that is such a broad swath of text, and the manufacturer's test I copied out of the supplementary packet held such a wide array of problems, that I could spend twenty minutes with Greg before identifying his confusion. Let's be plain: in the

average class period, I don't have twenty minutes to spend with Greg.

Under the classic scenario, students *hate* testing. They fear test days. They fake illness or cut classes in order to schedule a makeup and talk to their friends about what they saw on the test. For all our bluster as teachers that assessments are a celebration of learning, a time to show off all you've learned, under the classic scenario, students inevitably see assessment punitively.

Another shortcoming of the classic scenario is that it harshly punishes students who take until late in the semester (for any number of reasons) to succeed in mathematics. What incentive can the classic teacher offer a student averaging 27% to come to class? Why should the student come to class every day, come in for tutoring, or take any interest in her remediation, when no matter how well she does from then on, she'll *still* have a raft of low test scores from the beginning of the semester to drag down her grade.

Even if I'm a *responsible* classic teacher and I let her retake those tests, what of the less extreme cases? What of the student who had only a C knowledge of Chapter 7 when she took that unit test but has an A- understanding of the material *now*? It's a matter of principle: should a student's final grade reflect what she knew when I decided to assess her or should it consider her progress since then?

3. SEEKING ASSESSMENT SOLUTIONS

The ideal system is one that accurately reflects a student's *current* course knowledge, one that affords teachers a *clear* path for remediation, and one that *rewards* students for their knowledge and progress.

I lay no claim to the invention of this new standard in assessment, and even the descriptor "new" might be a misnomer. My assessment methods were inspired by a brief conversation with David Goodwin, currently of Monterey

Trail High School in Sacramento, CA, while chaperoning a varsity basketball game, and then shaped by two years of calibration and fine-tuning. It isn't perfect. I only know I wake up more excited to work on assessment days than any other day and that the process of entering test grades into my computer has become downright therapeutic.

4. THE NEW STANDARD

The new standard is simple in practice but requires a dramatic re-focusing. Simply put, teachers must no longer see Algebra (for example) strictly through the lens supplied by the textbook manufacturer:

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Chapter 1
Chapter 2
Chapter 3
Chapter 4
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Instead we need to see Algebra as a set of skills, each corresponding either to a state standard or a teacher's preference. I've divided Algebra into 35 skills, give or take, depending on the pace of the year. Here are two of the first skills:

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1. Operating with Integers
2. Solving Two-Step Equations
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Instead of assessing whenever the textbook demands and instead of assigning a single grade to a basket of concepts, I test each skill individually. I also grade each skill on a 4-point scale. There is no overall percentage. Greg's first test might look like this:

Greg Mays - First Report

1. Operating with Integers - 2/4
2. Solving Two-Step Equations - 4/4

The classic system would have me take an entire period to test ten additional concepts and then assign *one* grade to all of them. Here, there are no overall grades. I don't write a percentage in red across my students' tests. Assessment takes only a lean slice of class time, usually ten minutes a week for the most recent three skills.

The new standard also offers a laser-accurate view of a student's comprehension. From his first test, I know that Greg doesn't need any help with two-step equations but that his integer operation skills are weak. On the next test, usually a week later, I'll add one or two new skills but the beauty of the new standard is what happens to the skills I've already assessed. Let's say that on the second test, Greg's scores improve:

Greg Mays - Second Test

1. Operating with Integers - 4/4
2. Solving Two-Step Equations - 4/4

Remediation has clearly served Greg well with his integer operations and he demonstrated his proficiency to me again in solving two-step equations. Since I want Greg's grade to be the clearest and most accurate reflection of his knowledge possible, I only keep his highest score. I don't create a new column in my gradebook for each test, I simply overwrite lower scores and leave higher scores untouched.

Moreover, since Greg has shown me twice now that he can solve two-step equations (by design the second problem is more difficult than the first), I am

satisfied that he has mastered the skill. So I sign his "Skill Checklist" in front of him on the "Solving Two-Step Equations" row, verifying that he has *mastered* the skill and doesn't need to take it on any future tests.

Greg Mays - Progress Report

1. Operating with Integers - 4/4
2. Solving Two-Step Equations - complete

Seriously consider how Greg feels about that.

Greg has a difficult time in math and *hates* tests. They're neverending to him. Even if he succeeds on one test, he'll still have to prove himself again with the same skills on the next test. He has no incentive to improve deficient knowledge when he struggles enough with the current skills and remediation won't improve his grade until a retake or the final.

Meanwhile, over in my classroom, I have students who *ask* to be tested, who take ownership of the assessment process, and who are eager to prove that they now know more than they did the last time they were assessed.

The new standard offers students *measurable* goals which directly improve student disposition. It offers them a tangible and immediate reward for progressing and a clear finish line for individual skills -- just show me you can do it twice perfectly. The new standard is also compassionate and gives students the benefit of the doubt that their lower scores are due to the myriad external factors that *define* "test stress" in other classes.

At the semester's end and during progress report season, I'll have a crowd of students outside my door for morning tutoring. I may have thirty minutes to work with six of them, which leaves no time to waste in reassessment. Thankfully, the new standard is *built* for this kind of differentiated instruction. I

simply scan my gradebook and tutor the lowest skills.

More powerfully, the new standard offers students an *immediate* chance to demonstrate improvement. Tests no longer have high stakes when any free moment can be the occasion for re-assessment. After I tutor a student in the morning, I write up a fast one-question assessment on a piece of scratch paper. I immediately correct it, re-adjust her grade, and give her the positive feedback that is the very momentum of student success.

The new standard helps me serve my students better than any other system, and *certainly* better than the classic system, which is punitive, slow to reward student progress, and unresponsive to remediation. When calibrated appropriately, the new standard also accomplishes the seemingly impossible task of aligning a class directly to the state standards while simultaneously *enlivening* it.

It's possible I'm wrong. It's possible there may be a better record of my best teaching than this document. I now think the best record will be the 100 students who didn't suffer under assessment this year but, for the first time in most of their academic lives, felt tangibly served by it.