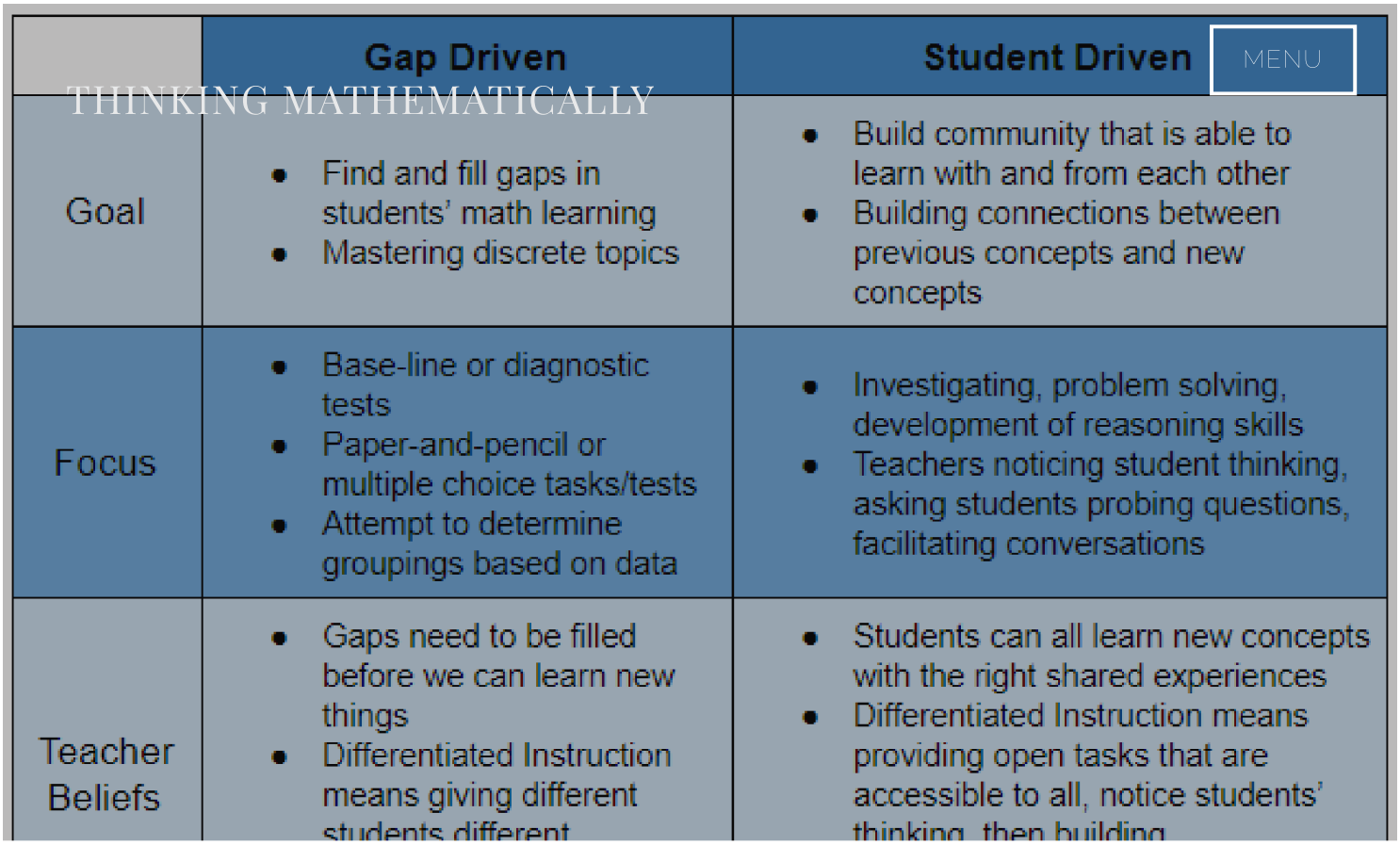


	Gap Driven	Student Driven
Goal	• Find and fill gaps in students' math learning • Mastering discrete topics	• Build community that is able to learn with and from each other • Building connections between previous concepts and new concepts
Focus	• Base-line or diagnostic tests • Paper-and-pencil or multiple choice tasks/tests • Attempt to determine groupings based on data	• Investigating, problem solving, development of reasoning skills • Teachers noticing student thinking, asking students probing questions, facilitating conversations
Teacher Beliefs	• Gaps need to be filled before we can learn new things • Differentiated Instruction means giving different students different	• Students can all learn new concepts with the right shared experiences • Differentiated Instruction means providing open tasks that are accessible to all, notice students' thinking, then building

How Not to Start Math Class in the Fall – 2020

MAY 21, 2020

MARK CHUBB

A few years ago Tracy Zager wrote a wonderful article called "How Not to Start Math Class in the Fall" where she shared the pitfalls of starting the year with diagnostic tests and instead gave a more positive and productive path which included setting a positive tone for learning mathematics and gathering useful formative data. While the article was a powerful reminder about what we should value and how we can help start the year off on a positive note, the article might be more important this year than most for us to consider.

The ending of the 2020 school year was (is) not ideal for many students (as we all know). Many students did not participate in learning from home platforms, and for those who did,

many did not participate regularly. And even for those who did participate regularly – with no fault at all placed on teachers or schools – the ability to give students experience to learn new materials, to observe students' thinking, to ask timely guiding questions, to monitor student progress, to know how/when/what to consolidate….. were not ideal or equitable (or possible in many cases) making learning mathematics difficult.

From conversations I have had with various teachers, I think we can all agree on a few things here:

- Learning over the past few months has not been ideal for many students;
- Learning about our students' thinking has been difficult, at best, for us, making it difficult to sequence learning, consolidate big ideas, and use various students' thinking to drive conversations; and
- There will be a huge discrepancy between how much / what students have learned over the past few months

Because of these three points, when students finally get back into classrooms we will likely have many eagre to attempt to make the best of things. However, what first moves we make when school returns matters more this year than ever. This leads me to wonder, will our decisions be driven by thoughts of how to fill gaps or how to build a community of learners?

	Gap Driven	Student Driven
Goal	• Find and fill gaps in students' math learning • Mastering discrete topics	• Build community that is able to learn with and from each other • Building connections between previous concepts and new concepts
Focus	• Base-line or diagnostic tests • Paper-and-pencil or multiple choice tasks/tests • Attempt to determine groupings based on data	• Investigating, problem solving, development of reasoning skills • Teachers noticing student thinking, asking students probing questions, facilitating conversations
Teacher Beliefs	• Gaps need to be filled before we can learn new things • Differentiated Instruction means giving different students different assignments based on readiness	• Students can all learn new concepts with the right shared experiences • Differentiated Instruction means providing open tasks that are accessible to all, notice students' thinking, then building conversations that facilitate important mathematics connections

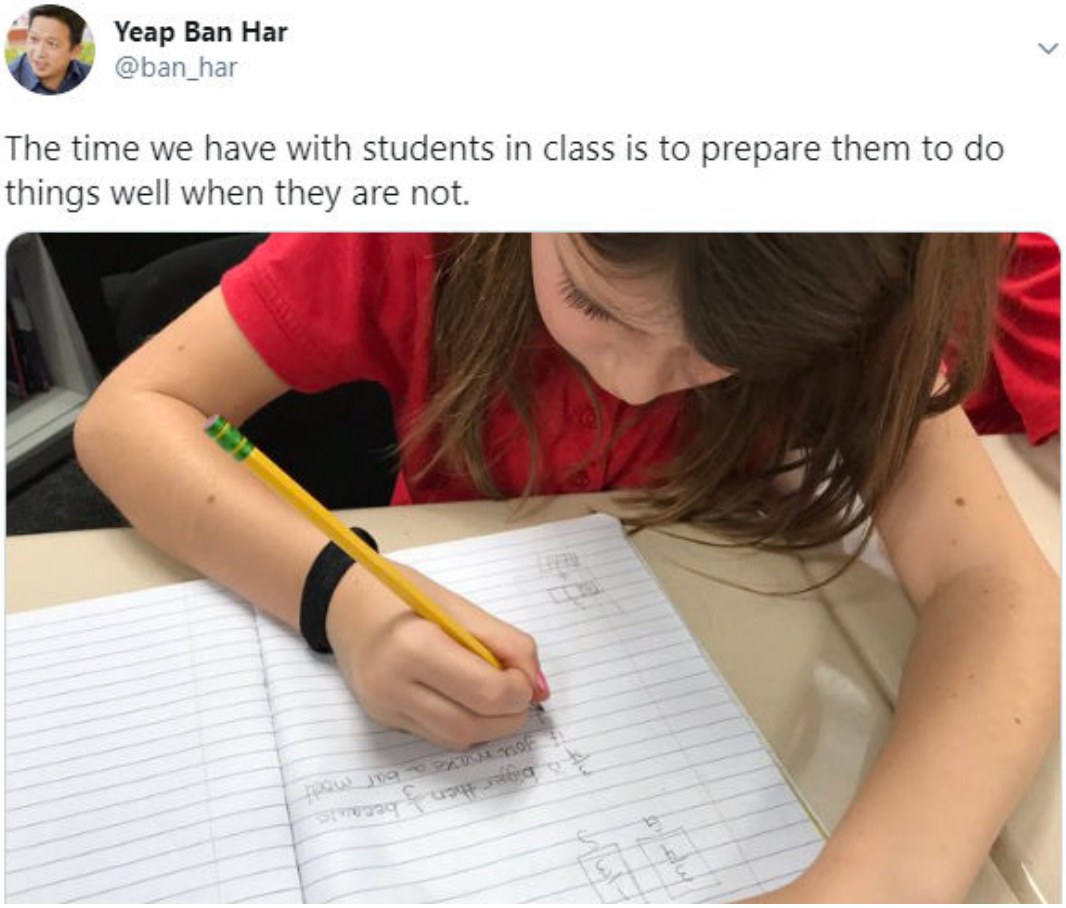
Whether or not things will go back to normal in the fall, even if we are back in schools, what we value and what we believe is important will have huge effects on the experiences our students have in our classrooms. For those who might be pushing a "Gaps Driven" message, I would like us to recognize the multitude of equity issues that surround this approach in normal circumstances. NCTM's new resource Catalyzing Change in Elementary and Early Childhood Mathematics offers some advice:

At the early childhood and elementary school levels, the use of pre-assessment data at the start of a unit or mathematics workshop to create flexible ability groups might seem harmless on the surface and even helpful. Proponents say that this practice allows teachers to figure out children's learning needs, then tailor the content and pace of instruction to children's varying levels of performance. However, flexible groups often lead to differentiated learning expectations and experiences and thus, differentiated learning outcomes. Students are perceptive and soon realize they are usually put in the same groups with the same other students. Any ability grouping in mathematics education is an inequitable structure that perpetuates privilege for a few and marginality for others.

Catalyzing Change in Elementary and Early Childhood Mathematics, 2020

The idea that many of our students will be in different places academically will be at the front of our thinking, however, there are many issues that we need to be thoughtful about. Families that have been able to support children from home this spring are at a direct advantage in the fall. Students from economically disadvantaged homes, or are from families that have limited access to technology or have mental health concerns, or students that have struggled with motivation or self-monitoring.... are at a particular disadvantage right now, and potentially in the fall.

So, how could we start the fall productively? Somehow, the first few weeks need to be a time to build community, engage in rich learning experiences where we can notice student thinking and create opportunities for collaboration and discussion norms. Dr. Yeap Ban Har might have said it best:



We have no idea what next year will look like. So, whatever time we do have in classrooms, we need to build the kinds of relationships and norms that will help us in case we are expected to once again learn from home.

How TO Start?

If we really are worried about gaps in prior learning, thinking about how to start all new learning with experiences that will help bridge current understandings with what your students will be learning will need to be a focus. Instead of starting with a test that quantifies learning or sorts kids, how about you:

- Start with a diagnostic Task for each new concept

- Choose a specific notice and wonder image as a shared experience where you can build important discussions about key concepts
- Use an open problem that is highly accessible. Then share specific examples with the group that lead to relationships between prior and new learning
- Choose a spatial task to help students learn to persevere when challenged
- Ask students to share what they know on a frayer model which can be updated throughout upcoming days
- Play a game that uses the concept you want to address so you can watch students' in action, then bring up what you have noticed with the class
- Anything to get your students DOING so you can NOTICE their current thinking and WONDER about what to do next.
- Anything that gets kids thinking, talking, sharing, testing ideas, playing with concepts, making conjectures, noticing patterns, building, representing.....

Content will come. Focusing on our kids as thinkers and doers of mathematics needs to come first. Doing so in ways that builds relationships and learning norms is where I would start!

A few things to reflect on:

- Some students have missed a lot of school / learning. Beyond content, what other aspects of learning math might be a struggle in the fall?
- How do you see equity playing a role in all of this? Pinpointing and focusing on student gaps often leads to inequities in experiences and outcomes. So, how can the ideas above help reduce these inequities?

- What you do the first few days/weeks will show your students what you value. What will your first days/weeks say about you as a teacher and the subject of mathematics to your students?
- If you noticed a lack of engagement this Spring, how can we better prepare for future disruptions by building the right kinds of relationships, norms and routines? What will you do in your first few days/weeks to start down this path?
- Maybe if you can see that some of the above strategies can really help you get to know your kids personally and mathematically, you might realize that a test might not be as valuable as you had thought.

As always, I'd love to hear your thoughts. Leave a reply here on Twitter (@MarkChubb3)

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