

Strengthening Systems and Supports: What Every Educational Leader Needs to Know and Do

**Virginia Tiered System of Supports
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Let's be clear:

We're being asked to do what has never been done before:

Make math work for nearly ALL kids and get nearly ALL kids ready for college.

There is no existence proof, no road map, and it's not widely believed to be possible.

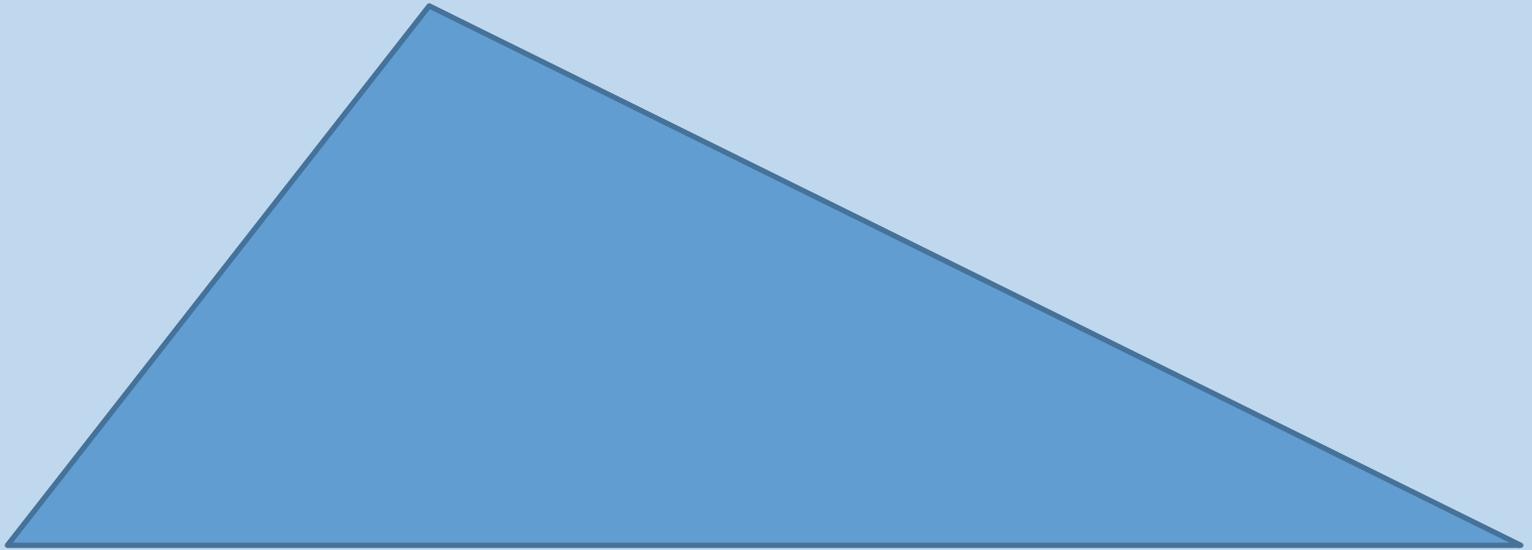
Let's be even clearer:

And because there is no other way to serve a much broader proportion of students:

We're therefore being asked to teach in distinctly different ways.

Again, there is no existence proof, we don't agree on what "different" mean, nor how we bring it to scale.

What do you see?



What do you see?



What is a triangle?

- a plane figure with three straight sides and three angles.
 - "an equilateral triangle"
- a thing shaped like a triangle.
 - "a small triangle of grass"
- a situation involving three people or things, especially an emotional relationship involving a couple and a third person with whom one of them is involved.
- noun: **eternal triangle**; plural noun: **eternal triangles**

Get set. Go.

What is $8 + 9$?

17 Bing Bang Done!

Vs.

Convince me that $9 + 8 = 17$.

Hmmmm....

$$8 + 9 =$$

17 – know it cold

10 + 7 – add 1 to 9, subtract 1 from 8

7 + 1 + 9 – decompose the 8 into 7 and 1

18 – 1 – add 10 and adjust or double - 1

16 + 1 – double plus 1

20 – 3 – round up and adjust

Who's right? Does it matter?

What is $1/10$ of 450?

**Convince us that $1/10$ of 450
is 45.**

For example:

Using models and representations

Siti packs her clothes into a suitcase and it weighs 29 kg.

Rahim packs his clothes into an identical suitcase and it weighs 11 kg.

Siti's clothes are three times as heavy as Rahim's.

What is the mass of Rahim's clothes?

What is the mass of the suitcase?

The old (only) way:

Let S = the weight of Siti's clothes

Let R = the weight of Rahim's clothes

Let X = the weight of the suitcase

$$S = 3R$$

$$S + X = 29$$

$$R + X = 11$$

so by substitution: $3R + X = 29$

and by subtraction: $2R = 18$

so $R = 9$ and $X = 2$

Or using a model:





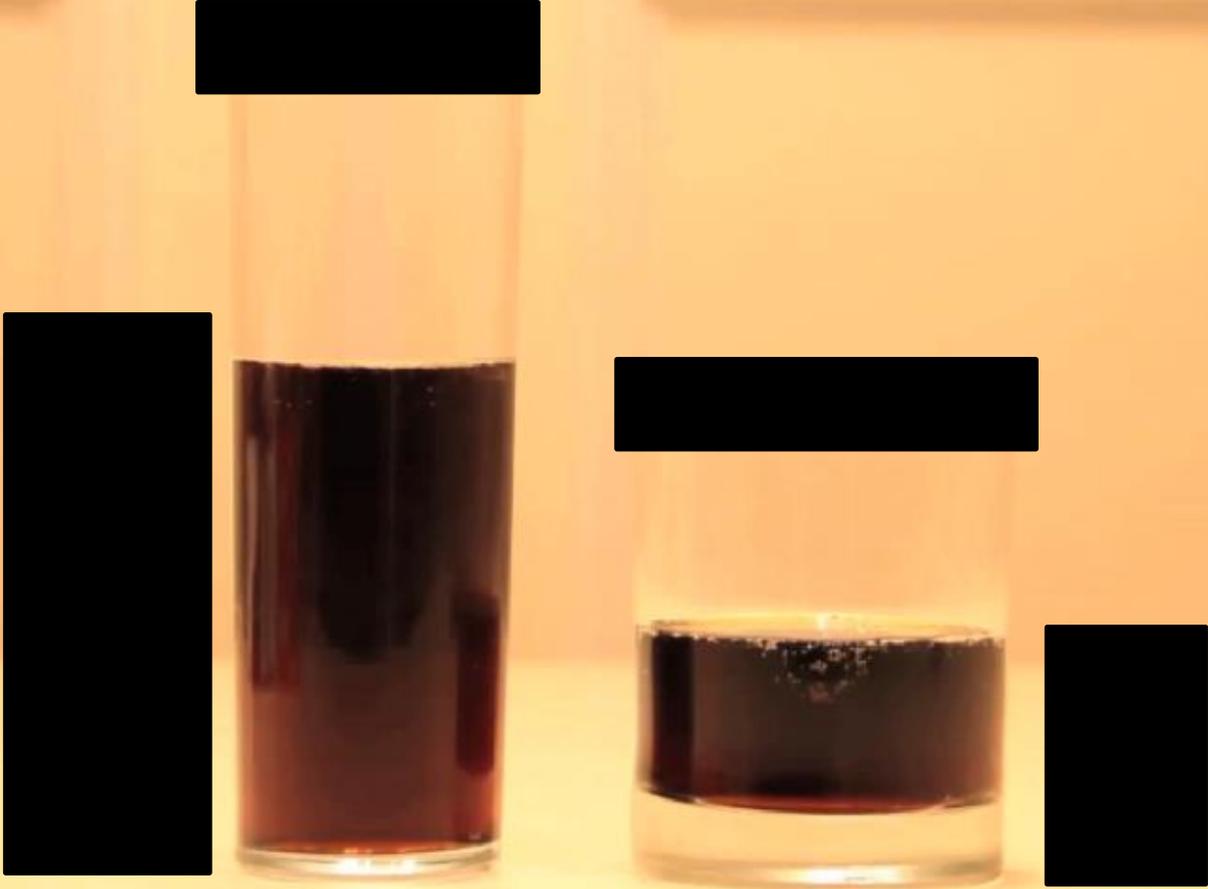
Tell me three things you see here.



What is your guess? Share your guess with your neighbor and justify your guess.



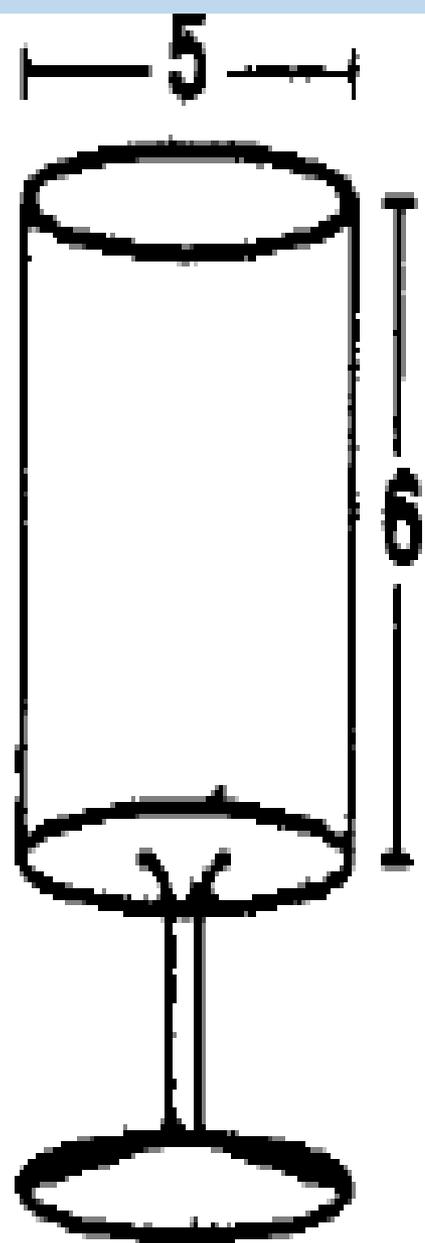
**What information is important here?
How would you get it?**



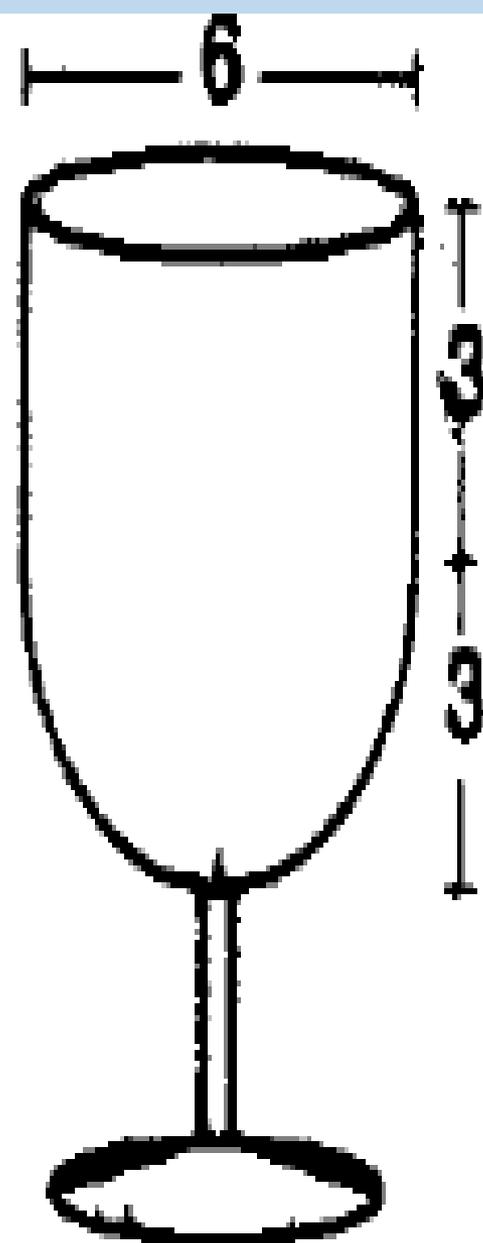


Was anything learned?

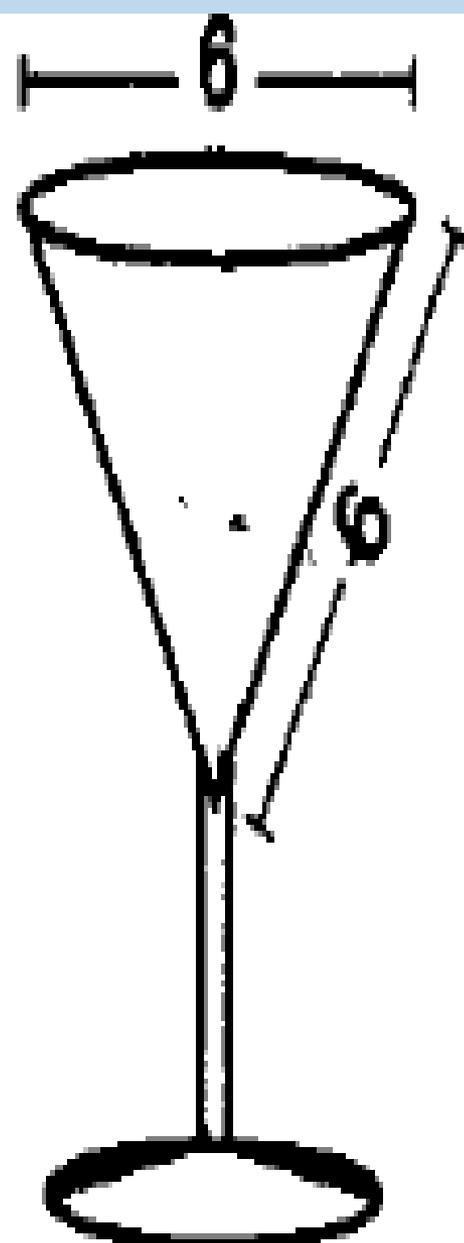
- **Now draw two glasses with different diameters and show the heights of equal amounts of liquid. Explain your reasoning.**
- **And on the unit test.....**



1



2



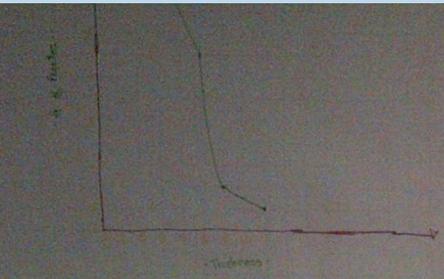
3

So?

- Order from smallest to largest and justify
- What is the height of Glass 3?
- What is the volume of each?
- If Glass 1 has volume V , express volume of Glasses 2 and 3 in terms of V
- When Glass 1 is $\frac{1}{2}$ full, the height of the liquid is 3 cm. What are the heights of the liquid in Glasses 2 and 3 when they are $\frac{1}{2}$ full?

Why do you think I used these tasks?

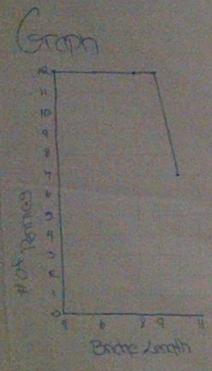
- **Standards don't teach, teachers teach**
- **It's the translation of the words into tasks and instruction and assessments that really matter**
- **Processes are as important as content**
- **We need to give kids (and ourselves) a reason to care**
- **Difficult, unlikely, to do alone!!!**



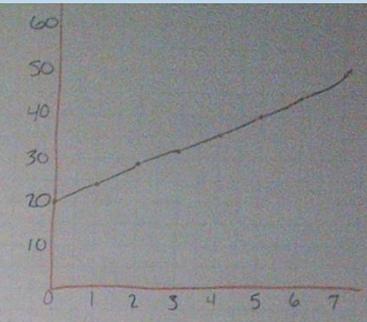
Table

Chay Jay Jada Dixon
Danyana Carah

length	4	6	8	9	11
# of Doves	12	14	12	16	17



1	24
2	28
3	32
4	36
5	40



$$y = 20 + 4x$$

Johnnie King

WHY?

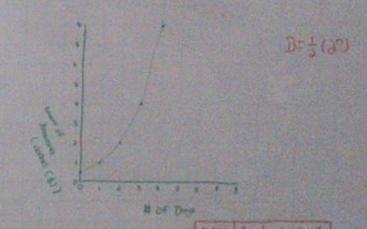
How do you know?

Convince me.

Explain that please.

Draw a picture.

Exponential



By: Ashli, Ariel

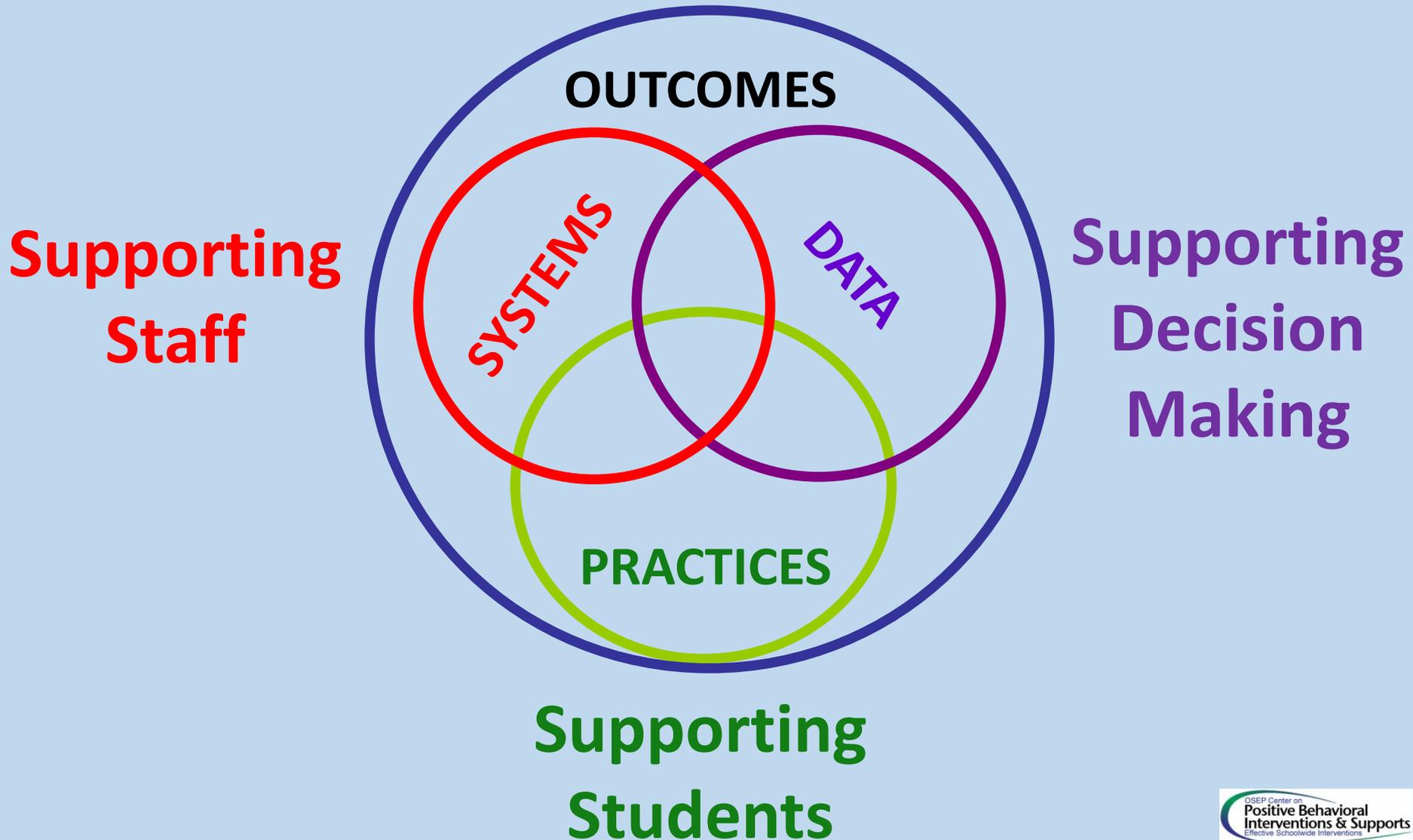
9 High Leverage Practices

- **Which one or two do you believe are most important?**
- **Which one or two seem most alien or unclear?**
- **What will it take to bring all nine to life in every classroom?**

Today's Goal

To engage you in thinking about (and then being willing and able to act on) the issues of thinking systemically about more effective instruction, higher expectations and building a culture of support and professionalism among the teaching staff. That is, perspectives, understandings and strategies for providing effective instructional leadership, particularly in K-12 mathematics.

Tiered System Supporting Improvements in Social Competence & Academic Achievement



**Here, in 6 parts,
is what we know.**

1. The key things we know

People won't do what they can't envision,

People can't do what they don't understand,

People can't do well what isn't practiced,

But practice without feedback results in little change, and

Work without collaboration is not sustaining.

Ergo: Our job, as professionals, at its core, is to help people envision, understand, practice, receive feedback and collaborate.

2. The 5 Core Elements of a Math Program

- A coherent and aligned curriculum that includes a set of grade level content expectations, appropriate print and electronic instructional materials, with a pacing guide that links the content standards, the materials and the calendar;
- High levels of instructional effectiveness, guided by a common vision of effective teaching of mathematics and supported by deliberate planning, reflection and attention to the details of effective practice;
- A set of aligned benchmark and summative assessments that allow for monitoring of student, teacher and school accomplishment at the unit/chapter and grade/course levels;

- **Student support for students who are struggling.**
- **Professional growth within a professional culture of dignity, transparency, collaboration and support.**

Professional Culture

What?

How?

How well and with
what student support?

3. The four key elements of an effective lesson:

- 1. The Math: learning goals, appropriateness, the big ideas, connections, common errors and misconceptions.**
- 2. The Tasks: that is the tasks, problems, activities and their richness, alignment with the goals, their appropriateness, their sequencing.**
- 3. The Instruction: how the tasks are orchestrated and conveyed: directions, grouping, who is doing the work, scaffolding, reviewing and debriefing.**
- 4. The Assessment: the evidence that is gathered to determine how well the learning goals were met.**

4. CCSSM Mathematical Practices (the first four)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.

5. Principles to Actions:

Ensuring Mathematical Success for All

Mathematics Teaching Practices

- Establish mathematics goals to focus learning.
- Implement tasks that promote reasoning and problem solving.
- Use and connect mathematical representations.
- Facilitate meaningful mathematical discourse.
- Pose purposeful questions.
- Build procedural fluency from conceptual understanding.
- Support productive struggle in learning mathematics.
- Elicit and use evidence of student thinking.

****6. A Progression of Insights****

- We are charged with making math work for a much greater proportion of students.
- But typical instructional practice of showing, telling and practicing to get “right answers” only works for about 1/3.
- To complicate matters, today’s world requires reasoning, solving problems, constructing viable arguments (SMPs).
- Thus math classes must reflect a different set of instructional practices – productive struggle, alternative approaches and multiple representations, discourse, explanations, conjectures and justifications (MTPs).
- But, this is different, difficult to do, requires time and risk-taking.
- Which is why we must have collaborative structures and coaching to support envisioning, practicing and providing feedback as we raise quality and impact.

What will it take?

Ergo: Leadership, Systems and Structures

- **Collaborative Structures**
- **Coaching**
- **Resources**
- **Intervention**
- **We're all in this together**

First, it will take:

**The time, leadership and opportunity
for collaborative structures.**

To collaborate, we need time and structures

- **Structured and focused department meetings, grade level meetings, course committees, and PLCs**
- **Before school breakfast sessions**
- **Common planning time – by grade and by department**
- **Pizza and beer/wine after school sessions**
- **Released time 1 p.m. to 4 p.m. sessions**
- **Hiring substitutes to release teachers for classroom visits**
- **Coach or principal teaching one or more classes to free up teacher to visit colleagues**
- **After school sessions with teacher who visited, teacher who was visited and the principal and/or coach to debrief**
- **Summer workshops**
- **Department seminars**

Vehicles, not ends

- Collegial classroom visits and debrief discussions
- Task analysis
- Collaborative planning
- Co-teaching and co-planning
- Common readings
- Lesson study
- Instructional rounds
- Analysis of student work
- Data reviews and actions
- Video analysis
- Learning communities
- Gallery teaching
- Common problem resolution discussions and plans

Never forget:

It's not a PLC that magically makes a difference. It's the content of, and follow-up and change that emerges from, the professional sharing and interaction that enhances the day-in-and-day-out opportunities for kids to learn mathematics!

Second, it will take:

**Knowledgeable, assertive,
passionate, sensitive,
respectful coaching.**

Question #1

Why would you tell a teacher whom you are coaching to differentiate, when you could be modeling differentiation in his/her classroom? (“who got the same answer in a different way?”)

Co-teaching without co-teaching

Interjecting myself into the class

without being a distraction

- “85”: The perfect moment, from the back of the room for: “Really, why is that?”, “Hold it a sec, can you convince your partner that it’s 85? [PAUSE] Go ahead and try it.” (becomes great fodder for discussion about missed opportunities and reasoning and alternative approaches)

Question #2

Why would you tell a teacher whom you are coaching about missed opportunities (“why?”, a chance to probe, a representation), when you yourself could have done that during the lesson?

Co-teaching without co-teaching Interjecting myself into the class without being a distraction

- 2 and $2/3$: [and from the back of the room:]
“Cool. Did everyone of you do it that way?
No? Can you come up and show us another
way? Anyone else?”

Question #3

Why would you talk about using representations in the abstract, when you could have drawn a bar model or silently gone to Desmos?

Co-teaching without co-teaching Interjecting myself into the class without being a distraction

- While students are explaining or teaching is talking away abstracting, sidle up to the board or the computer and capture the explanation with a picture or a diagram. You rarely need to do anything else to get the discussion focused on what you're written or drawn.

Question #4

Why would you ever observe an entire lesson,

And not provide oral and written feedback, an opportunity to discuss the lesson, and begin to craft an action plan ?

That's how coaching can significantly enhance the quality of teaching and thus student learning.

**Third, it will take access to (and
time to explore) resources**

Great On-line Math Resources

Learn Zillion: www.learnzillion.com

Inside Mathematics: www.insidemathematics.org

Illustrative Mathematics: www.illustrativemathematics.org

Conceptua Math: www.conceptuamath.com

NCTM Illuminations: <http://illuminations.nctm.org>

Balanced Assessment: <http://balancedassessment.concord.org>

Mathalicious: <http://www.mathalicious.com>

Dan Meyer's three act lessons:

<https://docs.google.com/spreadsheet/ccc?key=0AjlqyKM9d7ZYdEhtR3BJMmdBWnM2YWxWYVM1UWowTEE>

Thinking blocks: <http://www.thinkingblocks.com>

Decimal squares: <http://www.decimalsquares.com>

Math Assessment Project: <http://map.mathshell.org/materials/index.php>

Yummy Math: www.yummymath.com

National Library of Virtual Manipulatives:

<http://nlvm.usu.edu/en/nav/vlibrary.html>

**Fourth, it will take high quality,
connected, adequate time
allocated to interventions and
intensification for struggling
students.**

(especially double doses in K, 3, 6 and 9)

Long Reach HS

Howard County (MD) recognized that there were a significant number of 9th graders who were not being successful in Algebra 1. To address this problem, the county designed Algebra Seminar for approximately 20% of the 9th grade class in each high school. These are students who are deemed unlikely to be able to pass the state test if they are enrolled in a typical one-period Algebra I class. Algebra Seminar classes are:

- **Team-taught with a math and a special education teacher;**
- **Systematically planned as a back-to-back double period;**
- **Capped at 18 students;**
- **Supported with a common planning period made possible by Algebra Seminar teachers limited to four teaching periods;**
- **Supported with focused professional development;**
- **Using Holt Algebra I, Carnegie Algebra Tutor, and a broad array of other print and non-print resources;**
- **Notable for the variety of materials and resources used (including Smart Board, graphing calculators, laptop computers, response clickers, Versatiles, etc.);**
- **Enriched by a wide variety of highly effectively instructional practices (including effective questioning, asking for explanations, focusing of different representations and multiple approaches); and**
- **Supported by county-wide on-line lesson plans that teachers use to initiate their planning.**

We're all in this together and We all have a role to play

- **If students.....then teachers.....**
- **If teachers.....then school leaders.....**
- **If school leaders.....then central office leaders**

Pause and review

Lastly, it will take:

**Your individual and collective
initiative!**

**Do it, do it well, do it even
better!**

Questions

Promises

These Standards are not intended to be new names for old ways of doing business. They are a call to take the next step. It is time for states to work together to build on lessons learned from two decades of standards based reforms. It is time to recognize that standards are not just promises to our children, but promises we intend to keep.

— CCSSM (2010, p.5)

July 16, 2014 Washington Post

James MacGregor Burns, presidential historian and leadership scholar, dies at 95

“Leadership, in short, is power governed by principle, directed toward raising people to their highest levels of personal motive and social morality.

Power is different. Power manipulates people as they are; leadership as they could be. Power manages; leadership mobilizes. Power impacts; leadership engages. Power tends to corrupt, leadership to create.”

If you have power: use it wisely.

If you do not have power: turn to leadership.

Thank you!