

ACTL Mathematics Update

November 2, 2022

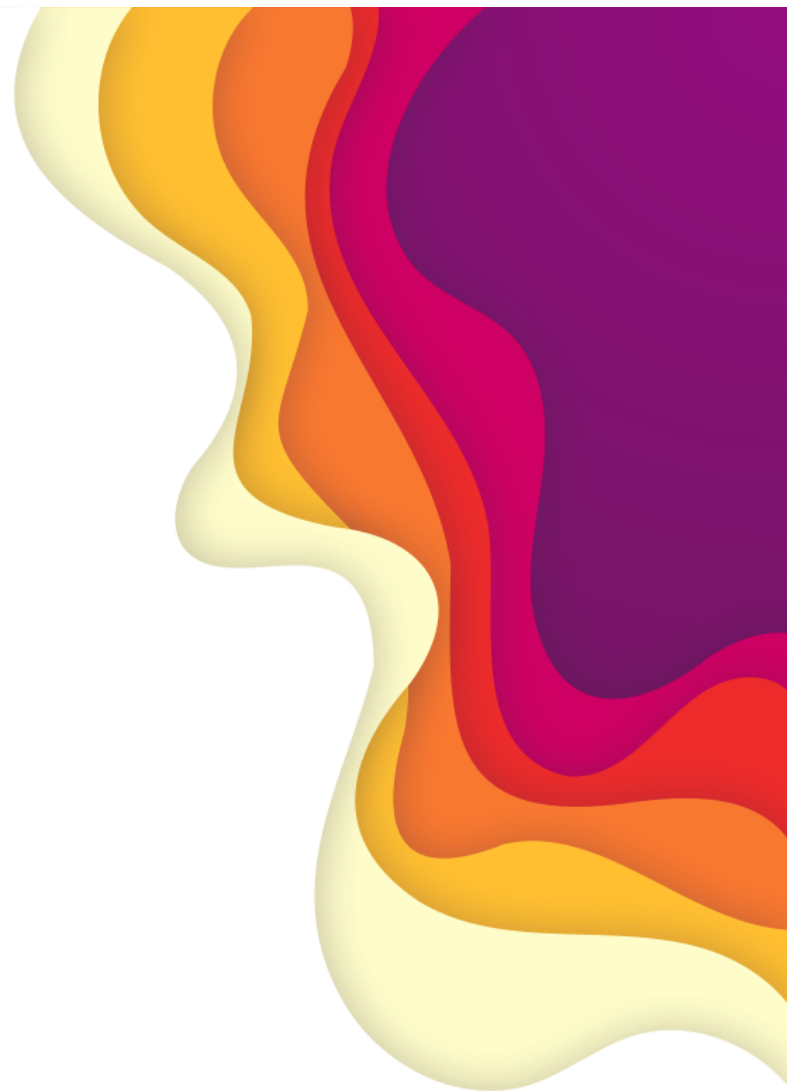


Inclusion Activity: Which Muppet best represents how you are currently feeling about mathematics in Arlington?



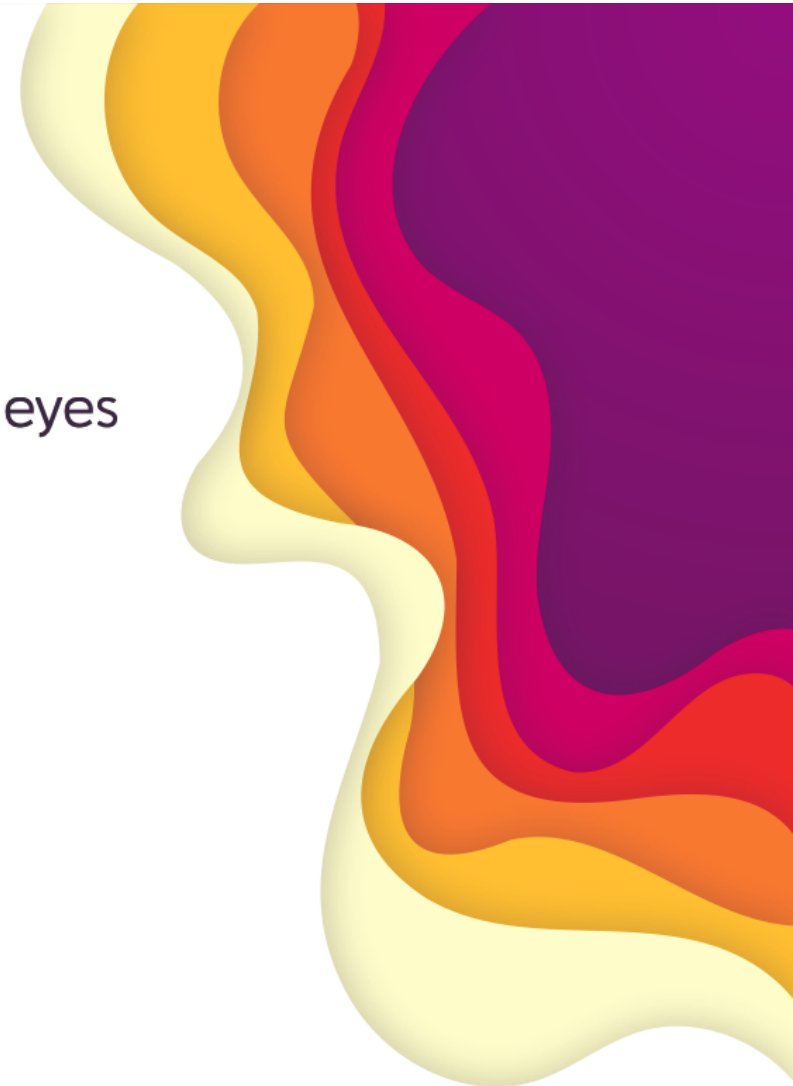
Learning Opportunities

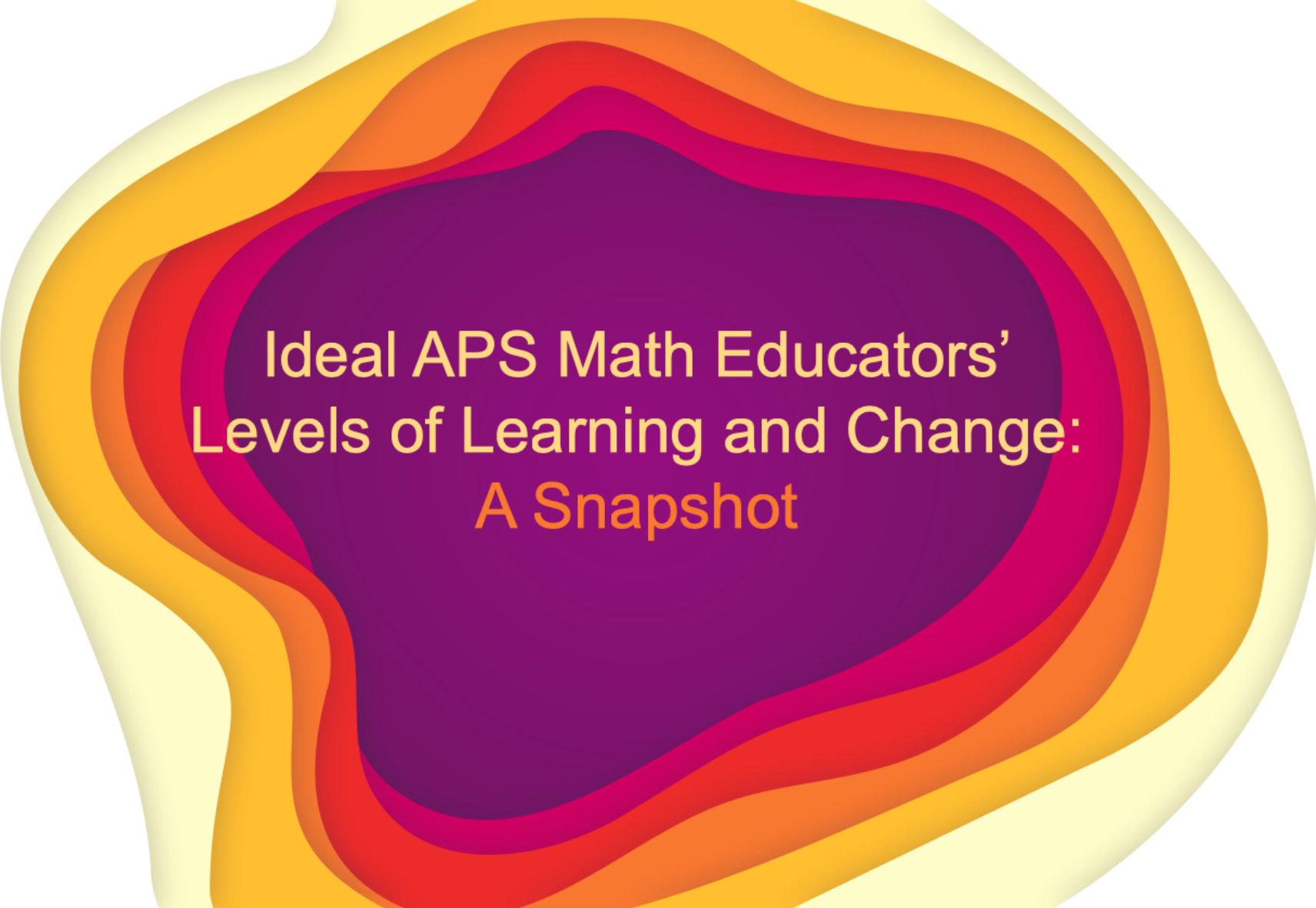
- Understand Mathematics Office's goals and beliefs that impact our work
- Understand the “why” behind instructional structures used
- Visualize the student experience in a mathematics classroom



Agenda

- The ideal APS Math Educator: Through the eyes of math leaders
- Math Office Goals
- Student-centered mathematics instruction: Structures and Systems of Support





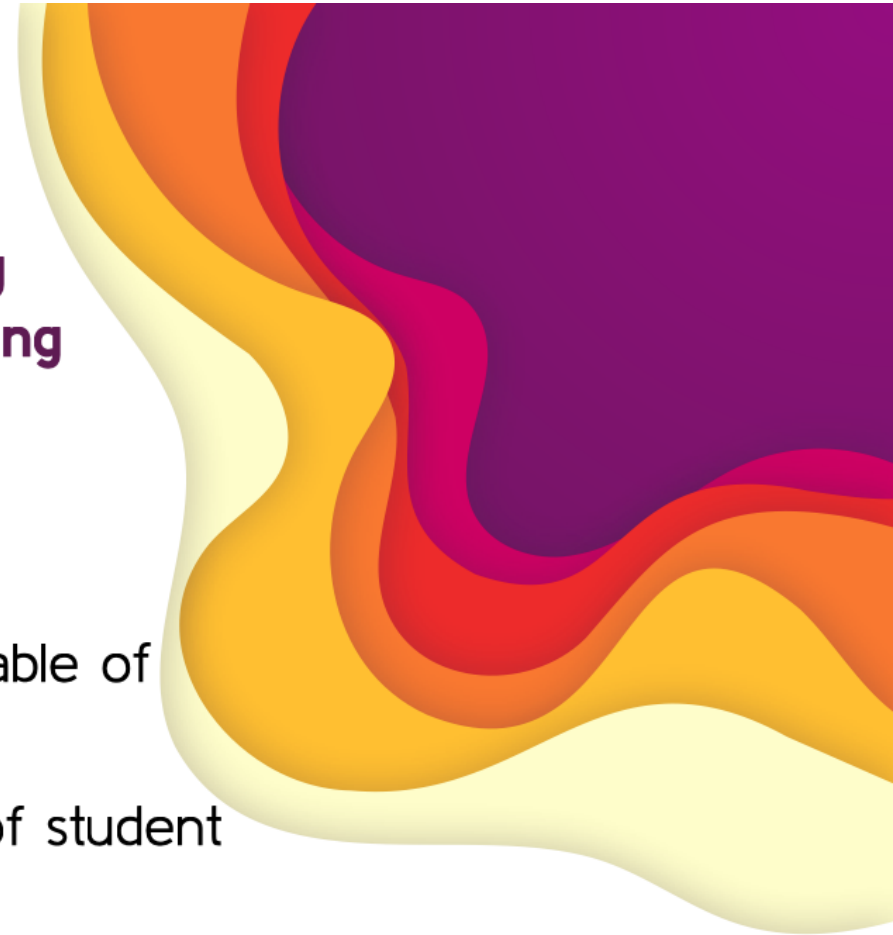
Ideal APS Math Educators'
Levels of Learning and Change:
A Snapshot

Identity

I am a flexible collaborator and lifelong learner who enjoys facilitating the learning of mathematics.

Beliefs/Values

- I believe that we are all math people capable of learning math at high levels.
- I value utilizing assessment for evidence of student learning.
- I believe intelligence can be developed through embracing mistakes as opportunities for growth.

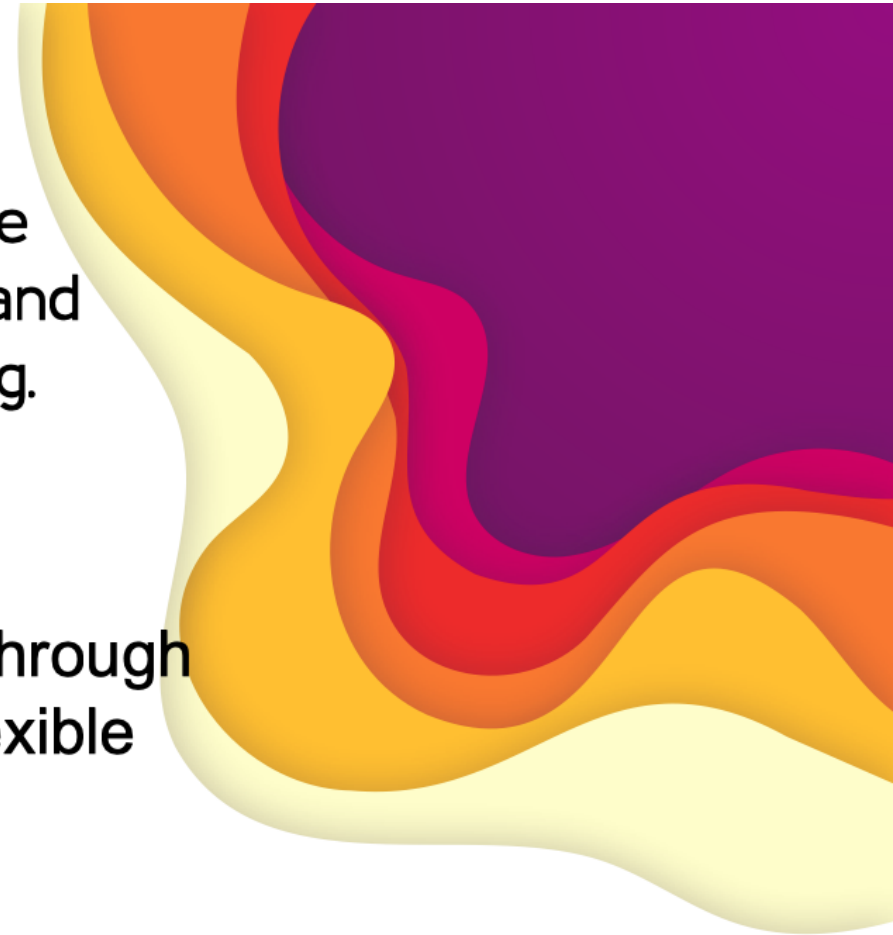


Capabilities

- I am capable of integrating equitable practices to meet students' needs and facilitating student-centered learning.

Skills/Behaviors

- I build student agency and identity through providing rigor and implementing flexible instructional strategies and student groupings.



Environment

- My teaching environment is inclusive, safe and includes varying instructional structures, with opportunities of student voice and choice, collaboration and discourse.





What Else Drives Our Work?

Math Office Goals

- We will continually gather data on our students' understanding to collaboratively determine how to modify instruction so that all students are given opportunities to fully engage in deep and rigorous mathematics based on their needs and goals.
- There will be consistency in content taught across the county to ensure equitable experiences and opportunities for all students.
- As mathematics educators, we will embody a growth mindset and engage in continual learning to grow our understanding of mathematics instruction collaboratively with peers across the county.
- Our classroom structures will promote a strong mathematics community through student choice, voice, collaboration, and reflection.

Research!

“...a child’s early understanding of mathematical concepts is one of the strongest predictors of later academic success.”

~UC Irvine

Research-Based Practices

Math Workshop Structures

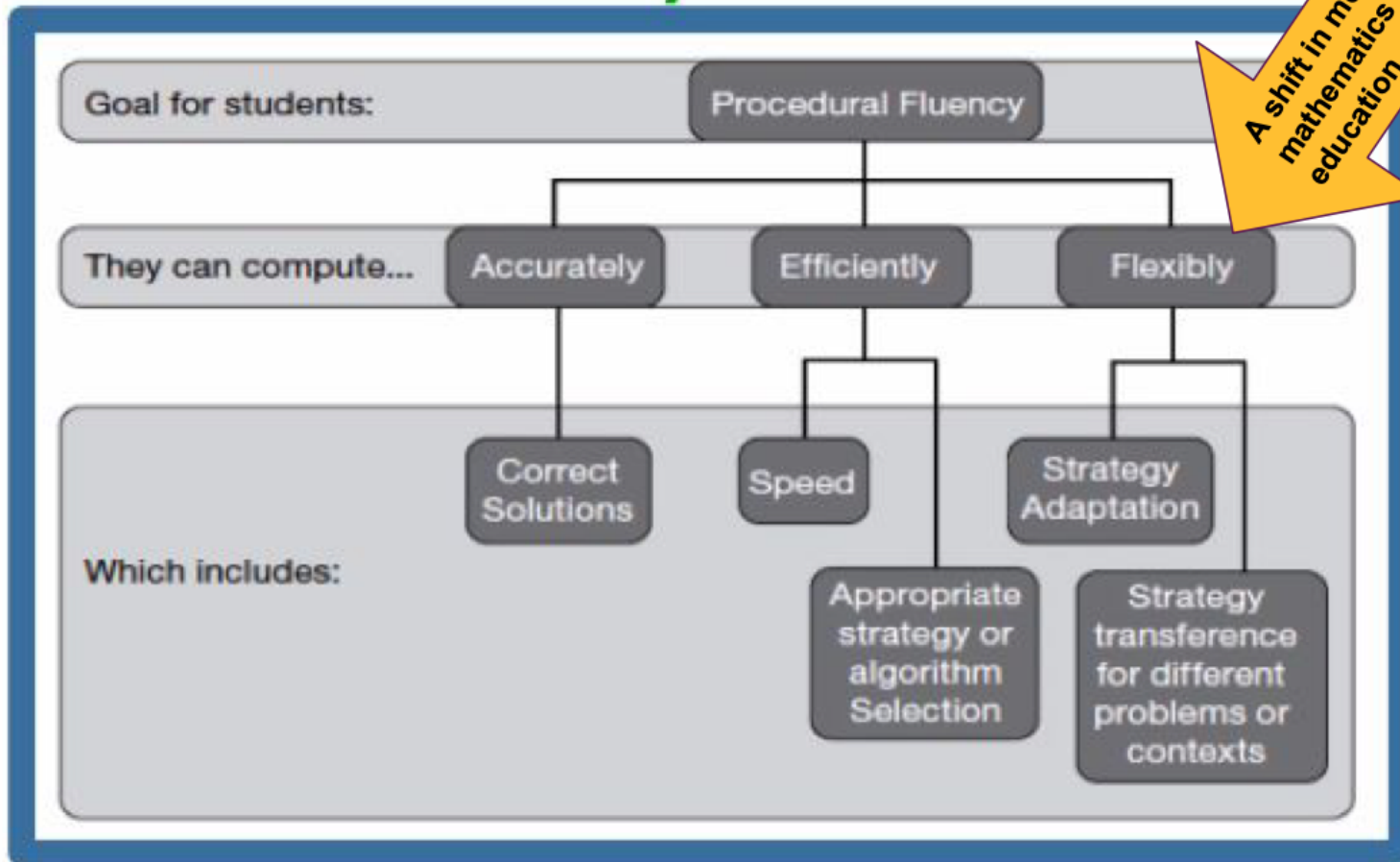
TASK & SHARE	FOCUS LESSON, GUIDED MATH, AND STATIONS	GUIDED MATH AND STATIONS	
NUMBER SENSE ROUTINE	NUMBER SENSE ROUTINE	NUMBER SENSE ROUTINE	
<p>MATH TASK One task is given, students work in collaborative groups. The teacher moves to small groups and provokes thinking through asking good questions. This task typically has multiple entry points, allowing for all students to have access to this problem. This could be a parallel task or open-ended question, one that supports differentiation.</p>	<p>FOCUS LESSON Whole group focus lesson that is well planned to allow for differentiation.</p>	<p>GUIDED MATH Teacher meets with groups of students in heterogeneous and/or homogeneous groups for small group instruction.</p>	<p>STATIONS Students are working on engaging activities that are mathematically purposeful. These activities could be in the form of a single, cognitively demanding question or a variety of stations in which student choice is a factor.</p>
<p>STUDENT SHARE Students share out about the various strategies that were used. Students ask questions, clarify their thinking, modify their work, and add to their collection of strategies in their tool box.</p>	<p>GUIDED MATH Teacher meets with groups of students in heterogeneous and/or homogeneous groups for small group instruction.</p> <p>STATIONS Students are working on engaging activities that are mathematically purposeful. These activities could be in the form of a single, cognitively demanding question or a variety of stations in which student choice is a factor.</p>		
REFLECTION	REFLECTION	REFLECTION	

Adapted from Lempp, J. (2017). *Math Workshop* (in press). Sausalito, CA: Math Solutions

Why Math Workshop?

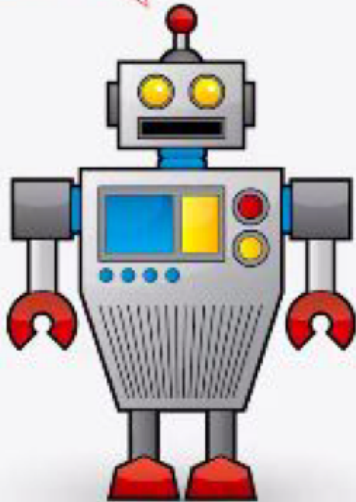
- Students start and end class together which creates a welcoming and inclusive learning community
- Teachers use data to determine necessary mini-lessons as well as guided-groups (small group instruction)
- Teachers use data to support station work (allows for student choice/with parameters and for spiral review)
- Promotes and supports student engagement in rich tasks
- Promotes student agency and math identity
- Embeds Math Process goals (problem-solving, communication, reasoning, connections, representations)
- Number sense routines support **mathematical fluency**

What is Fluency?



$$9 + 4 =$$

THIRTEEN



$$9 + 4 =$$

"I know that $10+4=14$ and that $10-1=9$ so..."

$4=3 \& 1$
 $9+1=10$
 $10+3=13$

?	
9	4

Thirteen!

$9 + 4 = 8 + 5$ and $8 + 5$ is 13, so $9 + 4$ is 13

A cartoon boy with brown hair, wearing a yellow shirt and blue pants. He has a speech bubble that says "Thirteen!". Several thought bubbles around him show different math strategies: one with a ten-frame, one with a number line, and one with a decomposition of 4.

Which has foundational fluency?



**Student-Centered
Instruction**

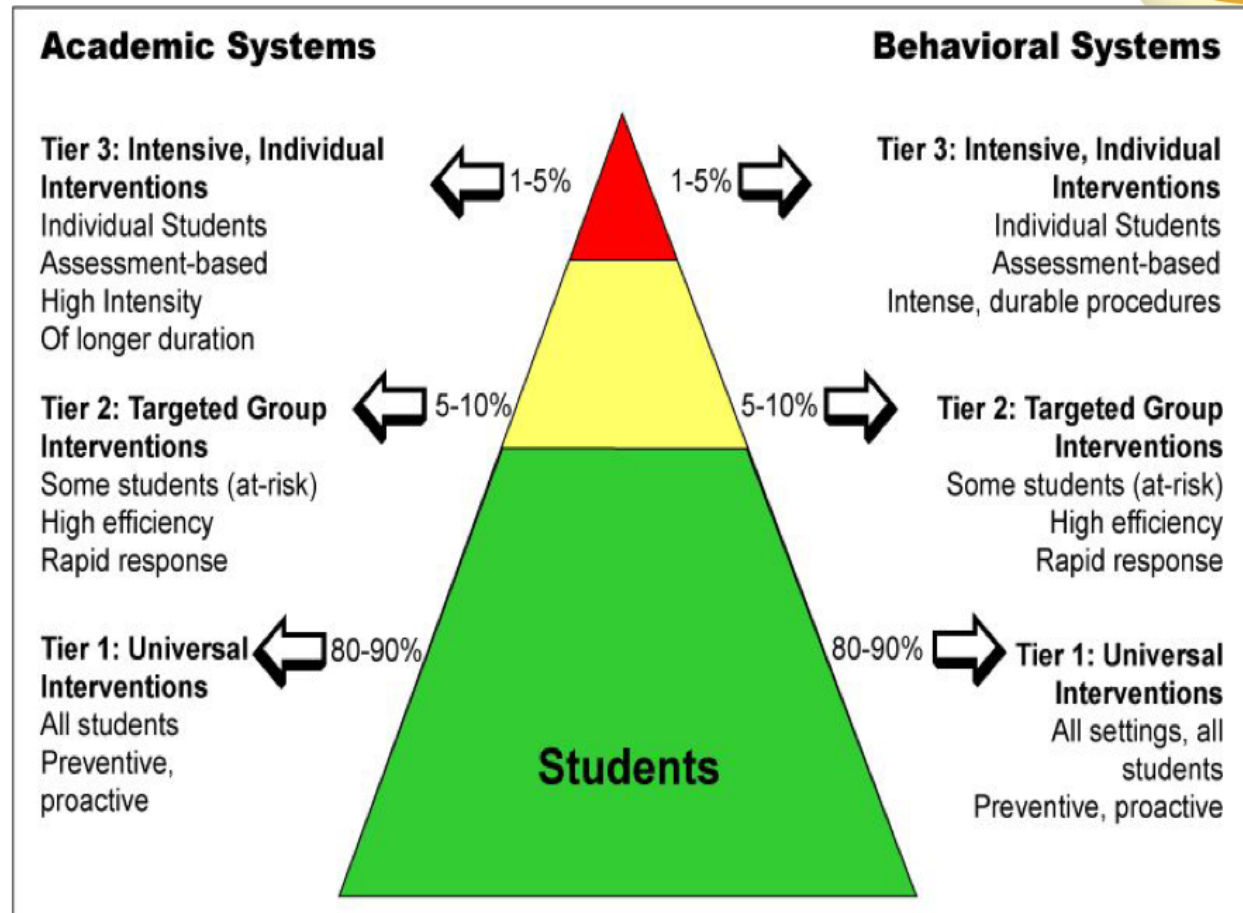
Student-centered Instruction.....

- **Teachers use student data to drive instruction. Data sources include:**
 - Unit pre and post-assessments and Quarter assessments
 - SOL assessments (including growth assessments)
 - Math Inventory Data
 - Dreambox Data
 - Teacher observation
 - Other formative and summative data



Classroom Practices: Tiered System of Support

ALL students are targeted in core instruction (Tier I). Some students require targeted intervention!



What Might Each Tier Look Like in the Classroom?

	Tier 1 - Mostly Supplemental	Tier 2 - More Comprehensive	Tier 3 - Most Comprehensive
	Individual needs are strategically addressed in guided math groups. Guided groups are based on data and serves an instructional purpose. Provide just-in-time support to help students access grade level curriculum.	Additional small group 2-5x weekly using research based programs/strategies, progress monitored and documented.	Additional intensive one-on-one or very small group meeting 4-5x weekly using research based programs/strategies, progress monitored and documented.
Elementary Mathematics Resources	Snapshot: All purpose: Curriculum documents, Savvas enVision, Dreambox Intervene or Extend: Math in Practice, Open Middle	Snapshot: Math in Practice, Kathy Richardson, Bridges, Do the Math, Dreambox*, William & Mary Units:	Snapshot: Bridges, Do the Math, Math Recovery®(by trained Math Recovery teacher), Kathy Richardson; Project M2/M3
Secondary Mathematics Resources	Snapshot: All purpose: Curriculum Documents, Savvas enVision, Dreambox Intervene or Extend: Bridging for Math Strengths, Open Middle Problems, CML,	Snapshot: Bridges, Dreambox*, VMath	Snapshot: Bridges, Math Recovery®(by trained Math Recovery teacher), VMath

APS: Accelerating Learning in Core Instruction (Tier I).....

- The Math Office has provided curriculum support to...
 - Ensure students have access to grade-level content
 - Support teachers with bridging learning standards
 - Strengthen core AND support targeted-intervention and extension needs



Accelerated Learning versus Remediated Learning



Remediation

involves spending significant time in below-grade level content *before* moving into new learning.

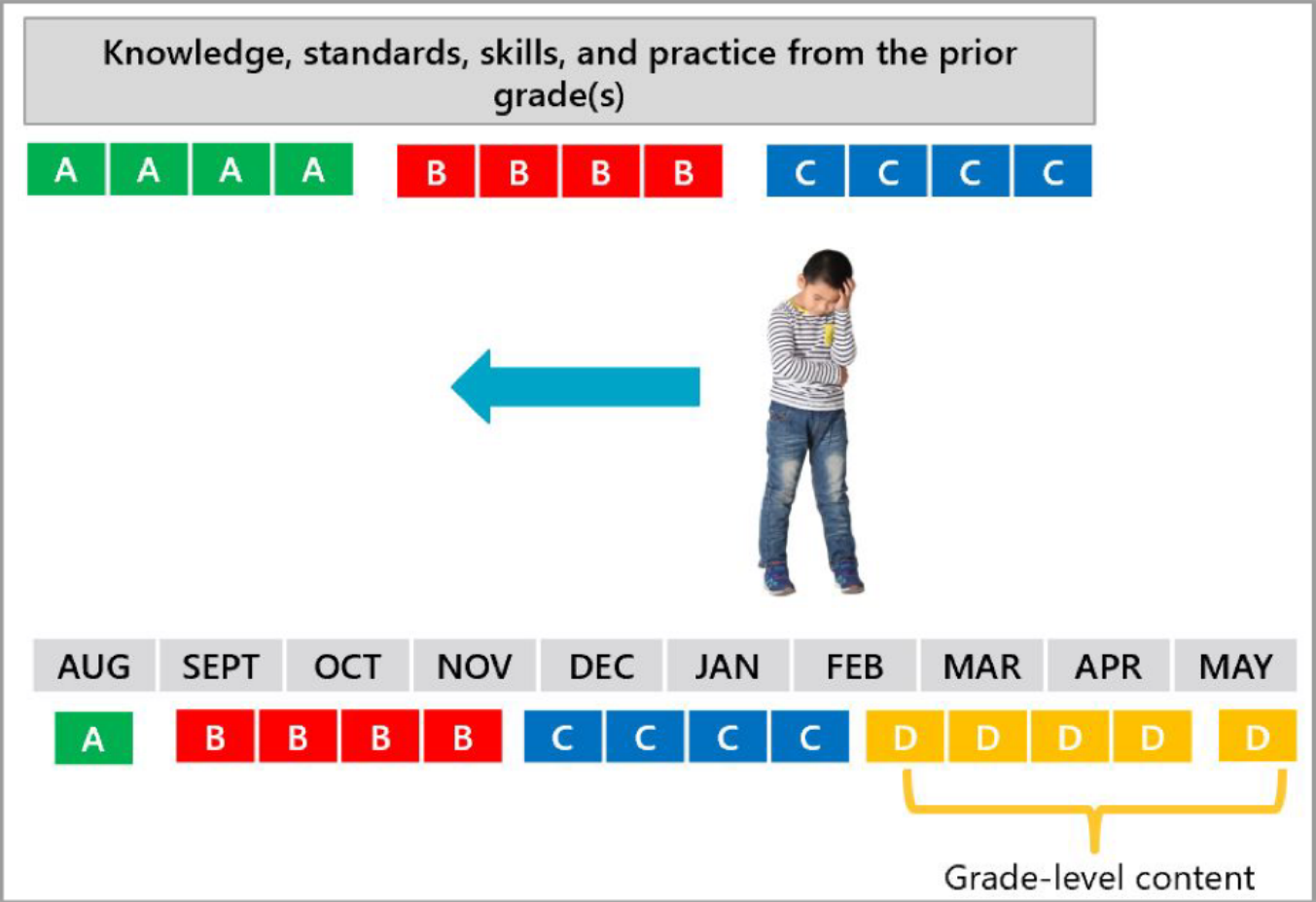


Acceleration

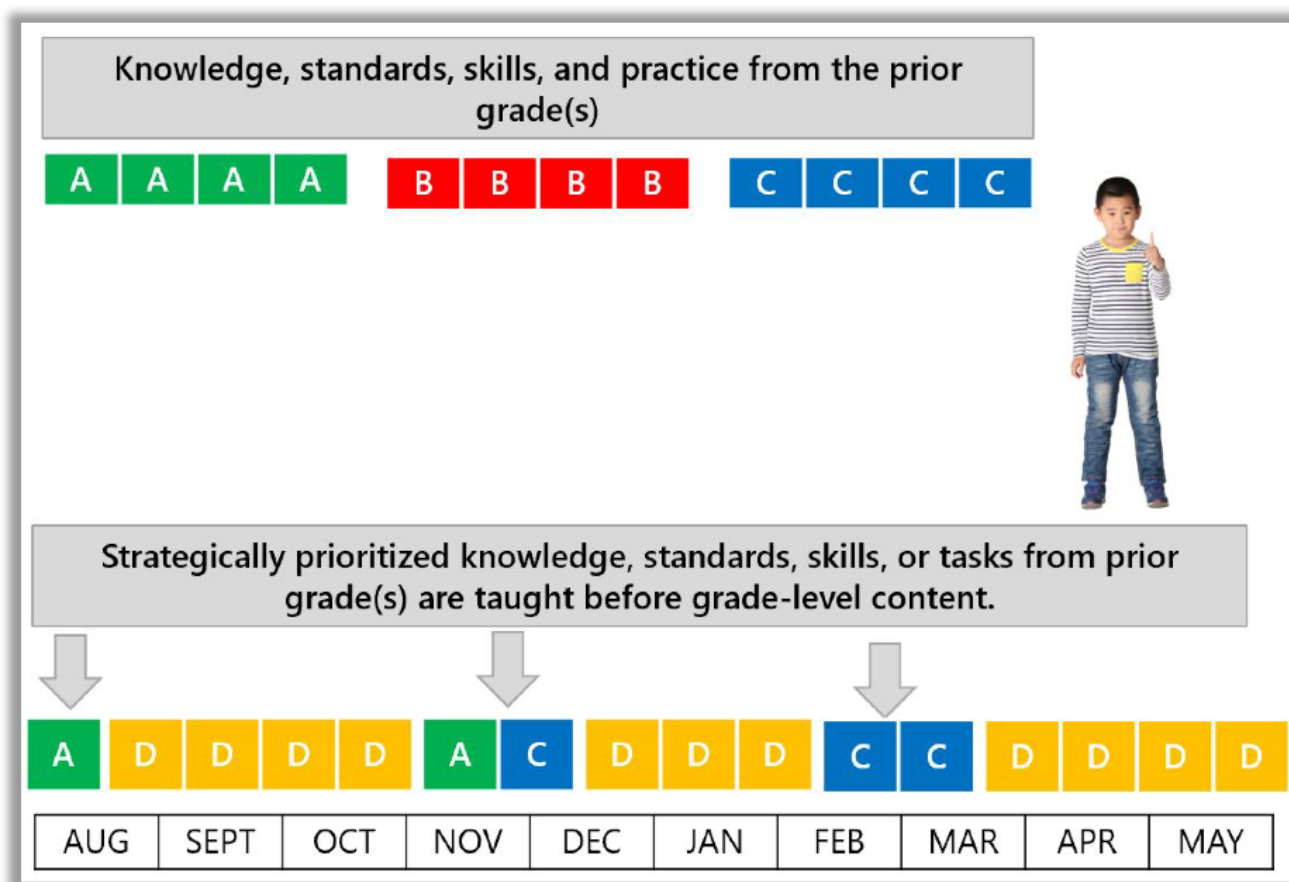
connects unfinished learning into the context of new learning, providing students “just-in-time” instruction.

Bottomline: Remediation anchors students and educators to content and concepts from prior grades while acceleration anchors students and educators to content and concepts from the student’s current grade.

Remediation tends to focus on mastery of previous years' content before attending to grade-level content..



In contrast, **acceleration** focuses on strategically building knowledge with **just-in-time instruction** so that students can **access grade-level content**.



In Summary

- All students receive high-quality instruction during core (Tier I) instruction **based on need** through opportunities for accelerated learning, targeted intervention, and extensions.
- **Intervention and extension needs are based on data and determined within units.**
- Student-needs are more strategically targeted through small-groups during core instruction. Some students require additional interventions which may occur outside of core.
- **Ongoing data collection and classroom observations are used to determine necessary instructional supports for individual teachers, specific grade-levels, and individual schools.**

Reflection: After this short presentation, which picture best describes how you are feeling about instructional support in the moment?





Thank you!