From Theory to Practice: A Crosswalk of Six Principles of Effective Pedagogy & Standards of Mathematical Practice in Context of Year 1 Turn Around Plan

2017.2018

Frederic T. Greenhalge Elementary School

Magaly R. Ronan, Assistant Principal

Getting To Know Each Other:

Audience - Raise your hand if you are a/an….

- Administrator/Director?
- Consultant?
- Parent?
- Teacher?

My Story

- 1st Generation American Puerto Rican
- Former English Language Learner
- Former Head-Start Graduate
- Former Title One Student
- Product of lPS & 2nd earn H.S. Diploma
- First Generation College Graduate & Post-Graduate Studies
- Former Teacher & Mathematics Coach of Elementary & Middle School Mathematics - 8 Years Urban
- Former LPS Elementary Mathematics Support Specialist 5 Years
- Former LPS Elementary Mathematics Coordinator PK.4 6 Years
- Interim Lowell Middle School Principal 5-8 1 Year
- Assistant Principal

Content & Language Objectives

- Participants will gain
  - a general overview Six Standards of Effective Pedagogy & Standards for Mathematical Practice
  - a general understanding “of My attempt” at a crosswalk between the two guiding documents.
  - a general understanding of the integration of the two within the context of a Year 1 Turn Around Grant.
  - a sense of impact using AIR Report Site visit

- Participants will be able to explain/write how the practice standards align with six principles of effective pedagogy

“Integration not compilation.” - J.Neary, Greenhalge Principal

Do Now – SEI Strategy – Write Around

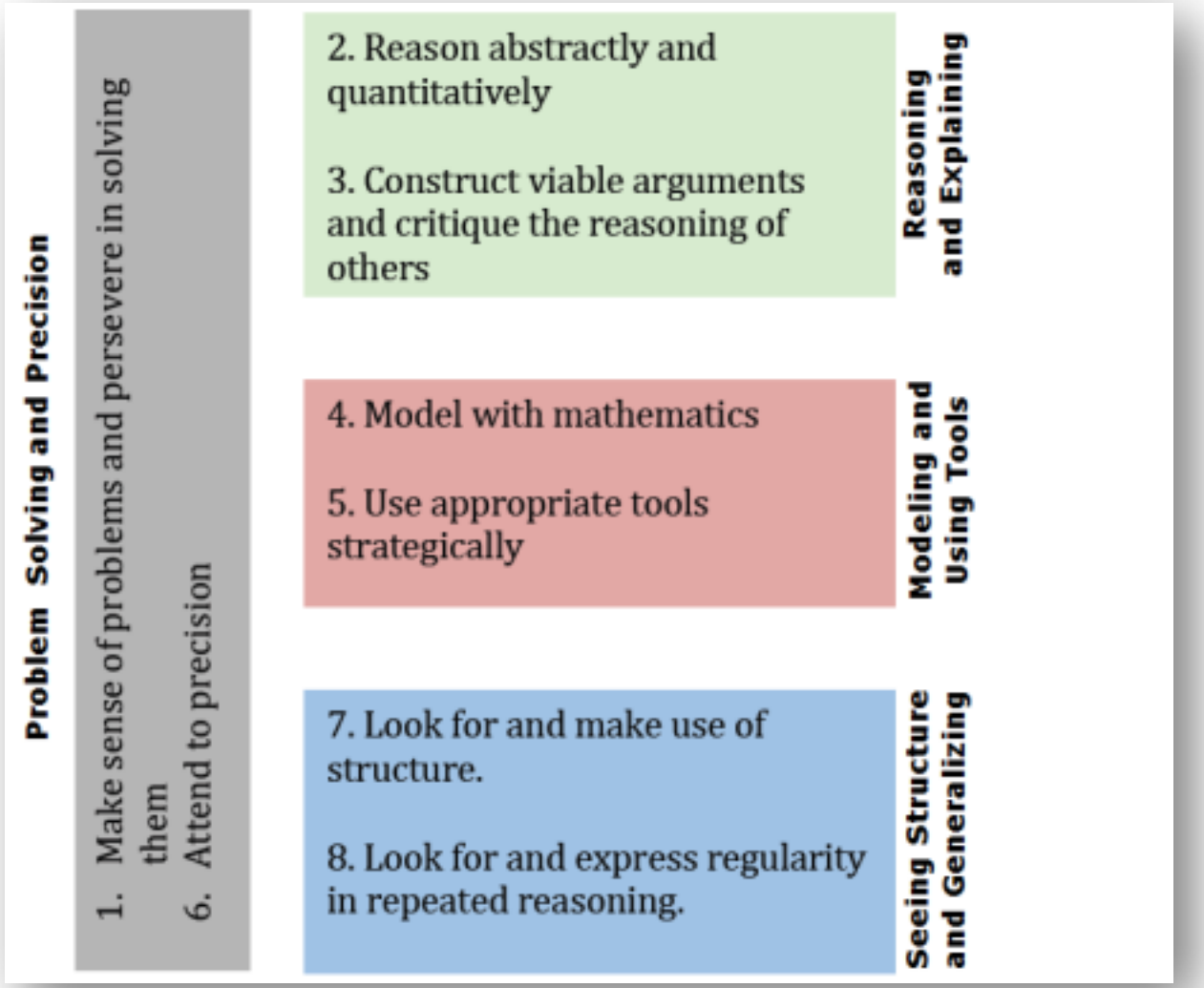
Topic: What do you already KNOW and/or DO about the Six Standards of Effective Pedagogy and Mathematical Practices?

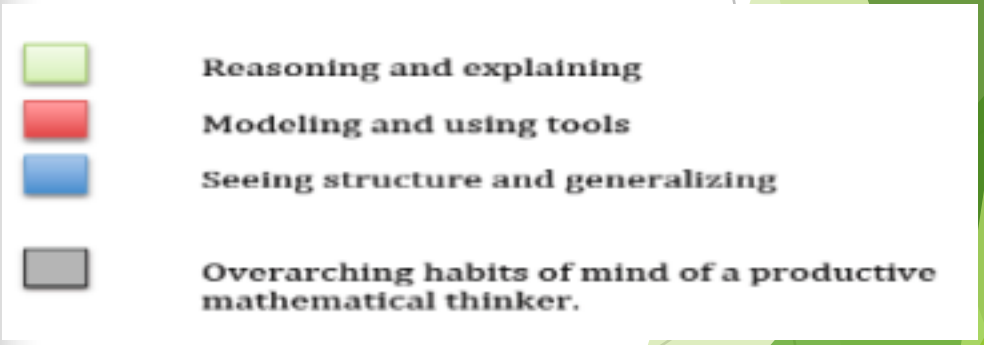
1. Write a sentence or two.
2. Pass the paper to the left when instructed or done.
3. Read what has been written and add on.
4. Continue writing on the paper until all have participated
5. When instructed, return the paper to its original owner to share with the whole group.

The Practices: What do we know?

- Derived from NCTM Process Standards and Adding It Up - Strands of Mathematical Proficiency
- Observable
- Span PK - 12
- Planning and Pedagogy are connected
- Critical Areas emphasize some content, process over others.

Structuring 8 Standards for Mathematical Practice





Unpacking a Mathematical Practice

…applying the mathematics students know to solve problems arising in everyday life, society, and the workplace. **Mathematics is "modeled" in solving problems – as solution strategies emerge and as the problem's solution is represented mathematically.**

…writing an addition equation to describe a situation (primary grades). **Mathematics is "modeled" when expressions (4x + 5), equations (4x + 5 = 17), and inequalities (4 < 7) are used to mathematically describe a problem or its solution.**

…applying proportional reasoning to plan a school event or analyze a problem in the community (middle grades). **A proportion may be used to solve and represent a problem's solution. The proportion is a mathematical model.**

…making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. **A problem's solution may come in stages, with the initial response being an approximation, which may be "fine tuned" as a closer estimate or as an exact response, each stage being a mathematical representation or model.**

…identifying important quantities in a practical situation and mapping their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. **Student solutions may be presented using a diagram or table or graph, such mappings are also models of mathematics.**

Stopped!

Unpacking SMP's

Mathematical Practice: _____

Mathematically proficient students:

Concepts (NOUNS)	Skills (Verbs)
What does it sound like?	What does it look like?
What should students do to engage in this practice?	What should teachers do?
What have I already done? What do I still need to accomplish this practice?	Formative Assessments?

ems&tl

McDANIEL COLLEGE

Standards for Mathematical Practices

- describe *mathematical content* students need to learn.

SP1. Make sense of problems

"… students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends."

Standards for Mathematical Practices

- describe *nature of learning experiences, thinking processes, habits of mind, and dispositions* that students need to develop a deep, flexible, and enduring understanding of mathematics

SP1. Make sense of problems

"….they [students] analyze givens, constraints, relationships and goals. ….they monitor and evaluate their progress and change course if necessary. …. and they continually ask themselves "Does this make sense?"

Standards for Mathematical Practice

The eight standards for mathematical practice place an emphasis on students *doing* mathematics and *demonstrating* learning.

Back to the Mathematical Practices

Really important: "A lack of ***understanding*** effectively prevents a student from engaging in the mathematical practices." (p. 8)

Six Principles (Standards) of Effective Pedagogy

Standard 1: Joint Productive Activity (JPA) - Teacher & Student Produce Together
Standard 2: Language & Literacy Development (LLD) Developing Language & Literacy Across the Curriculum
Standard 3: Contextualization (CTX) Making Meaning: Connecting School to Students' Lives
Standard 4: Challenging Activities (CA) Teaching Complex Thinking
Standard 5: Instructional Conversation (IC) Teaching Through Conversation
Standard 6: Critical Stance (CS) Teaching to Transform Inequalities

Going Deeper with Joint Productive Activity = Collaboration

- JPA Goal: Is for TEACHER and STUDENT to PRODUCE something Together.
- SEI Endorsement Course Introduces several strategies that could lead to JPA, including and not limited to:

Quick Write Data Analysis Jigsaws Iceberg Activity Corners activity Debriefings	Mix and Match Snowballs Gallery Walks Analyzing text Vocabulary Roundtable Write Around Language Experience Approach

Key Vocabulary

ssistance is a two-part process in which the teacher first assesses student knowledge and skills, and then responsively assists development. Types of assistance may include: (a) Modeling -- Providing a demonstration; (b) Feeding Back -- Providing information about student performance as compared with a standard; (c) Contingency Management: -- Providing rewards or punishments contingent on student performance; (d) Questioning -- Providing questions that guide students to advance their understanding; (e) Instructions -- Providing clear verbal directions for performance; (f) Cognitive Structuring -- Providing explanations or rules for proceeding; or (g) Task Structuring -- Providing assistance by segmenting or sequencing portions of the task.

Collaborate: Joint activity that results in shared ownership, authorship, use, or responsibility for a product. It can also include division of labor for coordinated sub-sections. However, mere turn taking does not constitute division of labor and, to be considered collaboration, an activity must include interaction between participants. Coordinated activities such as morning message or calisthenics are rated at the Emerging level for JPA.

Product: Products may be tangible or intangible. Examples of tangible products: worksheet, essay, report, pottery, word-web, a math problem solved on the blackboard, play, skit, game, or debate. Intangible products may be found in such activities as 'story time,' introductory lectures, or some ICs (the product is an accurate or elaborated understanding of a concept, procedure, idea), or some PE activities (increased physical fitness is the product, though not joint). The intangible products are an achieved physical, psychological, or social state that integrates a series of actions.

tional JPA's in Action:

- Designing Learning Activities requiring student collaboration to accomplish a product.
- Matches JPA demand to the allotted time
- Arranges seating to accommodate individual, pair, group needs to communicate and work jointly
- Teacher/adult participates in JPA
- Regularly uses flexible grouping to promote interactions
- Models how students work in groups and transition routines
- Models and manages how to use tools appropriately to facility JPA
- Monitors and supports student collaboration in a positive way.

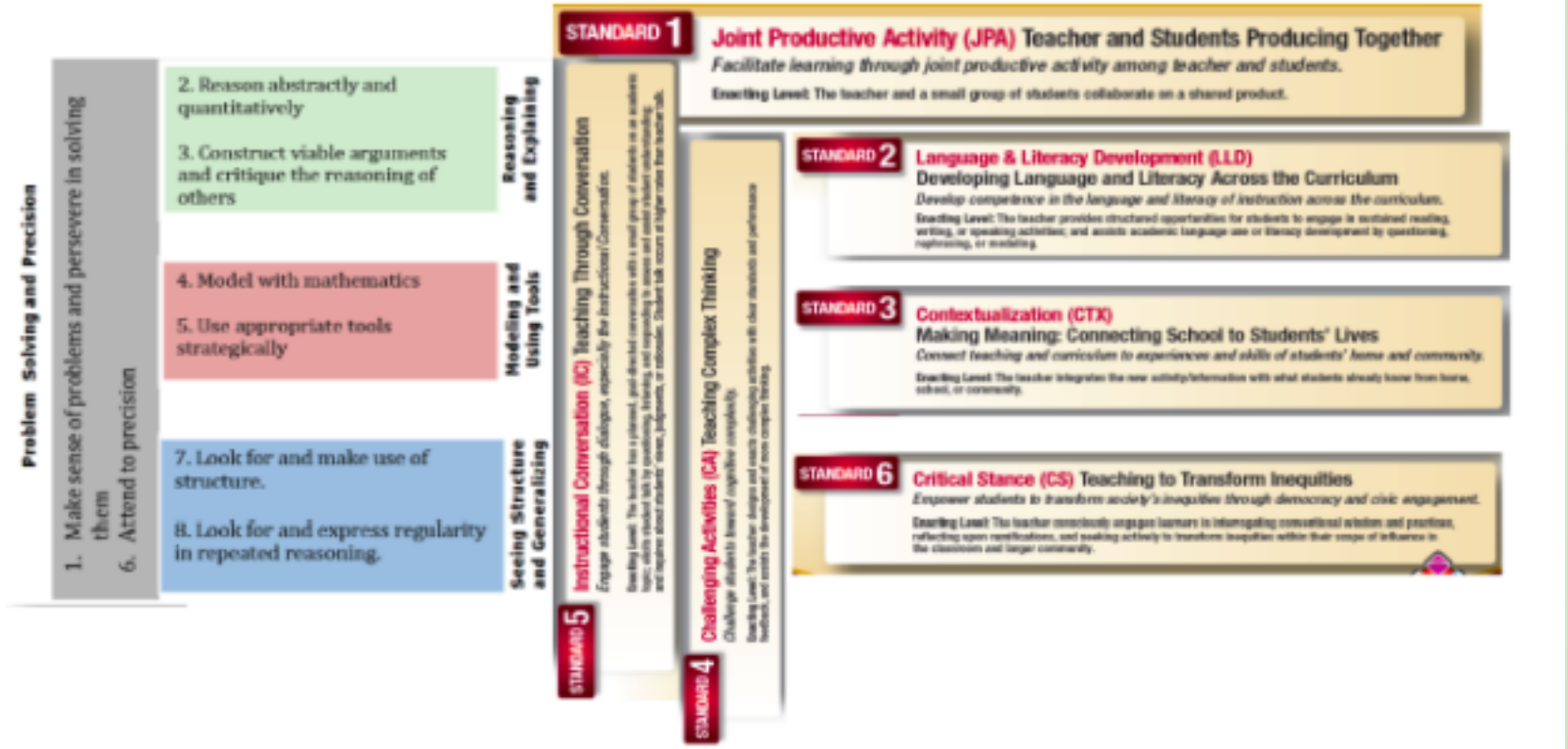
And the sweet spot for JPA is:

At the Enacting Level of Implementation:

Enacting (3) - The teacher designs, enacts, and **ASSISTS** in activities that demonstrate a complete enactment of the principle

Example: The teacher and a small group of students **COLLABORATE** on a joint **PRODUCT** (Teacher does not float.)

Crosswalk



Magaly R. Ronan SEI Six.SMPs
3/19/17

- Standards of Mathematical Practice define the role of the student in learning.
- Six Principles of Effective Pedagogy defines the role of the Teacher

NDARD 1 **Joint Productive Activity (JPA)** Teacher and Students Producing Together

Facilitate learning through joint productive activity among teacher and students.

Enacting Level: The teacher and a small group of students collaborate on a shared product.

Problem Solving and Precision

1. Make sense of problems and persevere in solving them
6. Attend to precision

Reasoning and Explaining

2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others

Modeling and Using Tools

4. Model with mathematics
5. Use appropriate tools strategically

Seeing Structure and Generalizing

7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

STANDARD 2 **Language & Literacy Development (LLD)**

Developing Language and Literacy Across the Curriculum

Develop competence in the language and literacy of instruction across the curriculum.

Enacting Level: The teacher provides structured opportunities for students to engage in sustained reading, writing, or speaking activities; and assists academic language use or literacy development by questioning, rephrasing, or modeling.

STANDARD 3 **Contextualization (CTX)**

Making Meaning: Connecting School to Students' Lives

Connect teaching and curriculum to experiences and skills of students' home and community.

Enacting Level: The teacher integrates the new activity/information with what students already know from home, school, or community.

STANDARD 4 **Challenging Activities (CA)** Teaching Complex Thinking

Challenge students toward cognitive complexity.

Enacting Level: The teacher designs and enacts challenging activities with clear standards and performance feedback, and assists the development of more complex thinking.

STANDARD 5 **Instructional Conversation (IC)** Teaching Through Conversation

Engage students through dialogue, especially the Instructional Conversation.

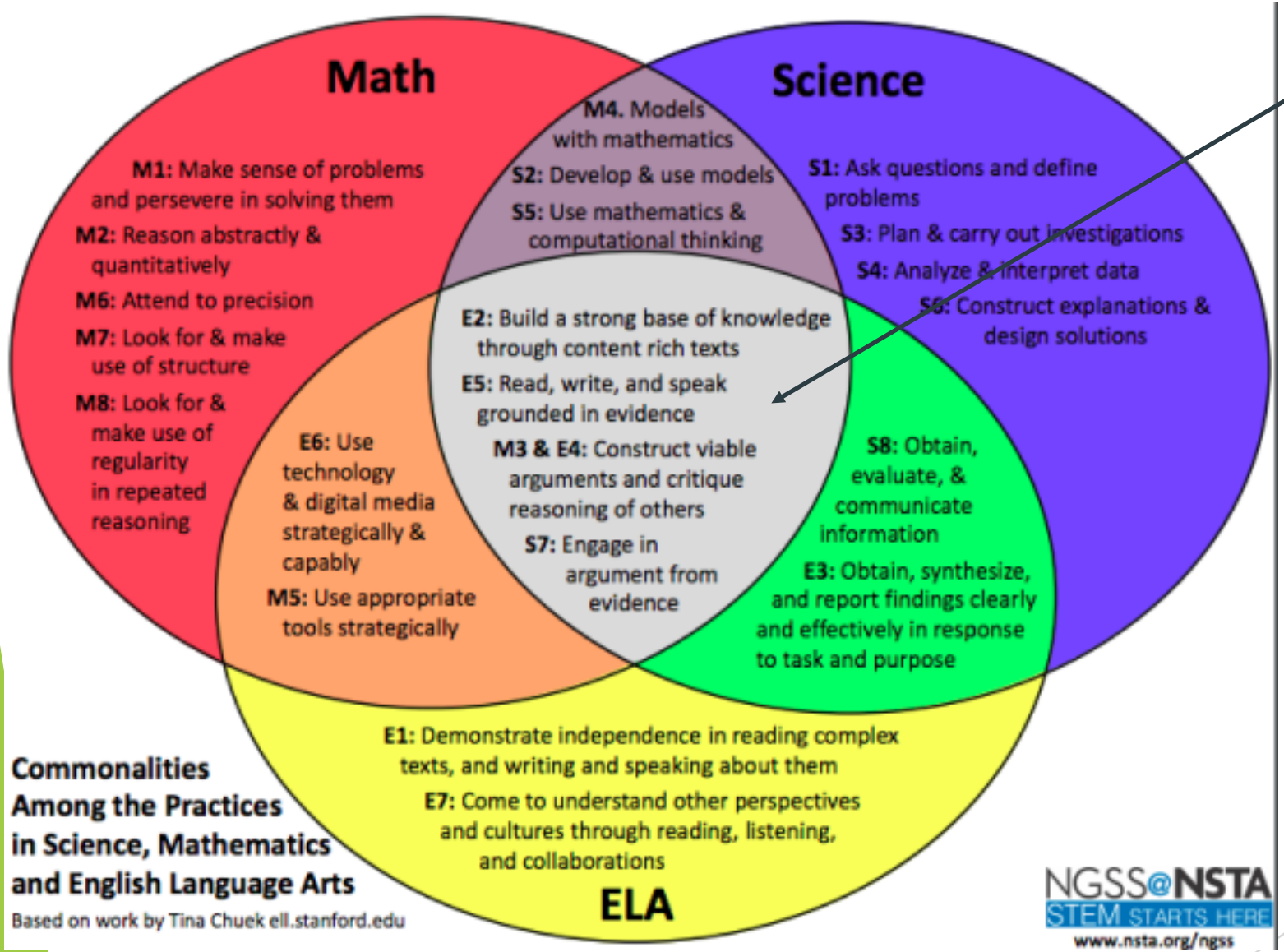
Enacting Level: The teacher has a planned, goal-directed conversation with a small group of students on an academic topic; elicits student talk by questioning, listening, and responding to assess and assist student understanding; and inquires about students' views, judgments, or rationales. Student talk occurs at higher rates than teacher talk.

STANDARD 6 **Critical Stance (CS)** Teaching to Transform Inequities

Empower students to transform society's inequities through democracy and civic engagement.

Enacting Level: The teacher consciously engages learners in interrogating conventional wisdom and practices, reflecting upon ramifications, and seeking actively to transform inequities within their scope of influence in the classroom and larger community.

Relationships of disciplinary practices across the Massachusetts Curriculum Frameworks for English Language Arts and Literacy, Mathematics, and Science Technology and Engineering



This is the sweet spot for us!

E2: Connect to self, to world, to other content; Regard for student perspective
E5: Instructional Conversation, Accountable Talk, Peer to Peer discourse
M2, E4, S7: Argue based on evidence, given social/academic norms.

CROSSWALK

8 Standards of Mathematical Practices (SMP)	SMP 1 Unpacked		Justification	6 Principles of Effective Pedagogy	Unpacked	
	Concepts (Noun/Word Phrases)	Skills (Verbs/Verb Phrases)			Concepts (Noun/Word Phrases)	Skills (Verbs/Verb Phrases)
1.Make Sense of Problems and Persevere in Solving Them. **6.Attend to Precision**	• Mathematically Proficient student • Problem • Entry points • Solution • Givens • Constraints • Relationships • Goals • Form • 'solution pathway' • analogous problems • special cases • simpler forms • progress • equations • correspondences • verbal descriptions • tables • graphs • diagrams • 'important features' • realtonships • data • regularity or trends • concrete objects • pictures • conceptualize • 'different method'	• Abstract • Approaches • Analyze • Answers • Attending • Attempt • Bring • Change course • Check • Consider • Contextualize • Conjectures • Creating • Decontextualize • Draw • Explain • Entails • Evaluate • Gain insight • Graph • Identify • Jumping in • Knowing • Make sense • Manipulate • Meaning • Monitor • Plan • Pause • Probe • Rely • Represent • Search • Solve • Try • Understand • Use	SMP 1 has strong crossover with CA for several reasons: • The 8 standards of mathematical practice are about what the students need to do to become mathematically proficient. • The 6 Principals of Effective Pedagogy is about what the teachers need to do to help students learn. • When posed with a rich task or story problem, students have to use their reading comprehension skills in order to understand all the words, the varied levels of language demands, and use their own knowledge and experiences to "make sense of the problem", in other words to analyze what they know in the problem, think about what they want to know, they need to attend to the conditions or constraints of the problem or think of analogous problems they have encountered in the past; devise a plan (executive function skills). • Students then need to rely on their tools, resources to have enough stamina in order to persevere in finding a viable solution. • Students need to develop and apply many problem solving strategies. • If students lack challenging activities then the space for students' opportunities to engage in the practices narrows. Thus, lowering the rigor for the giving content. (**Refer. To my taxonomy crosswalk**) SMP 6 has a strong crossover with IC for several reasons: • The essence of this practice is for students who are mathematically proficient to be able to communicate precisely to others • Students start with everyday social language and then map it to academic language in order to be more specific and clear in what they mean. • Students try to use clear definitions, state the meaning of symbols	**1.Joint Productive Activity (JPA)** **4.Challenging Activities (CA)** **5.Instructional Conversation (IC)**	**Joint Productive Activity** • **Joint Productive Activity** • **Teacher** • **Students** • **Product** **Challenging Activities** • Activity • Complex • Cognitive Complexity • teacher • 'Clear Standards' • 'performance feedback' **Instructional Conversation** • 'instructional conversation' • teacher • student • small group • academic topic • student views • judgements • rationale • 'higher rate' student talk • 'teacher talk' • Assists • Challenging • 'Complex thinking' • Designs	• **Produce** • **Facilitate** • **Learning** • **Collaborate** • Enacts • Teaching • Thinking • Toward • Development • Teaching • Engage • Dialogue • Planned • 'goal directed' • conversation • elicit • talk - occurs • questioning • listening • responding • assess • assist • understanding • inquiry/ies
	What does it sound like?	**What does it look like?**				

Look For's

Make sense of problems and persevere in solving them (e.g.):

1. Students: Are actively engaged in solving problems
2. Teacher: Provides time for and facilitates the discussion of problem solutions

Reason abstractly and quantitatively (e.g.):

1. Students: Use varied representations and approaches when solving problems
2. Teacher: Provides a range of representations of mathematical ideas and problem situations and encourages varied solution paths

Construct viable arguments and critique the reasoning of others (e.g.):

1. Students: Understand and use prior learning in constructing arguments
2. Teacher: Provides opportunities for students to listen to or read the conclusions and arguments of others

Model with mathematics (e.g.):

1. Students: Apply mathematics learned to problems they solve and reflect on results
2. Teacher: Provides a variety of contexts for students to apply the mathematics learned

Use appropriate tools strategically (e.g.):

1. Students: Use technological tools to deepen understanding
2. Teacher: Uses appropriate tools (e.g. manipulatives) instructionally to strengthen the development of mathematical understanding

Attend to Precision (e.g.):

1. Students: Based on a problem's expectation, students calculate with accuracy and efficiency.
2. Teacher: Emphasizes the importance of mathematical vocabulary and models precise communication.

Look for and make use of structure (e.g.):

1. Students: Look for, develop, and generalize arithmetic expressions
2. Teacher: Provides time for applying and discussing properties

Look for and express regularity in repeated reasoning (e.g.):

1. Students: Use repeated applications to generalize properties
2. Teacher: Models and encourages students to look for and discuss regularity in reasoning

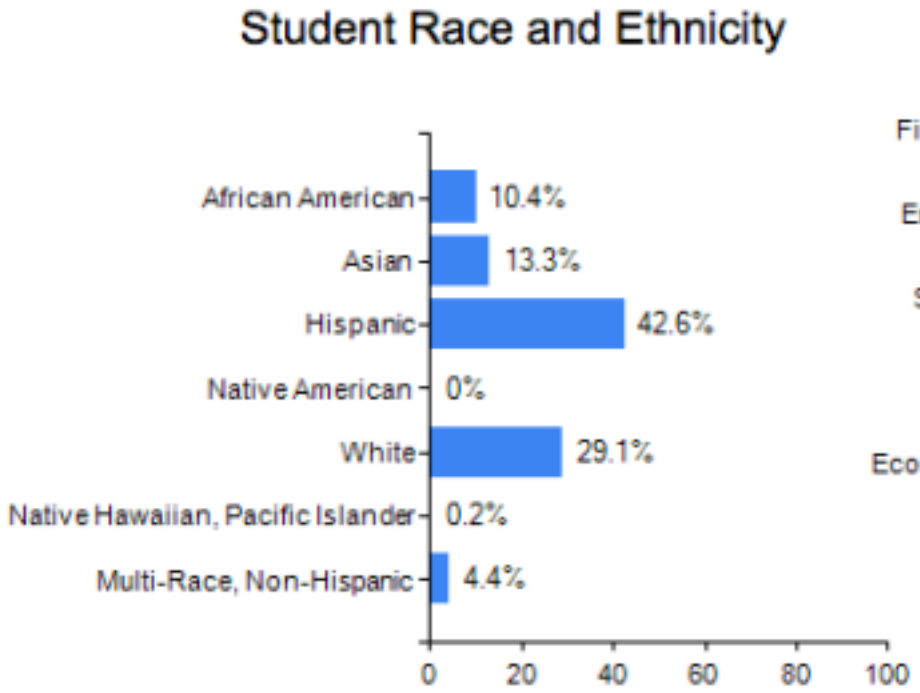
Take Your Integration Pulse

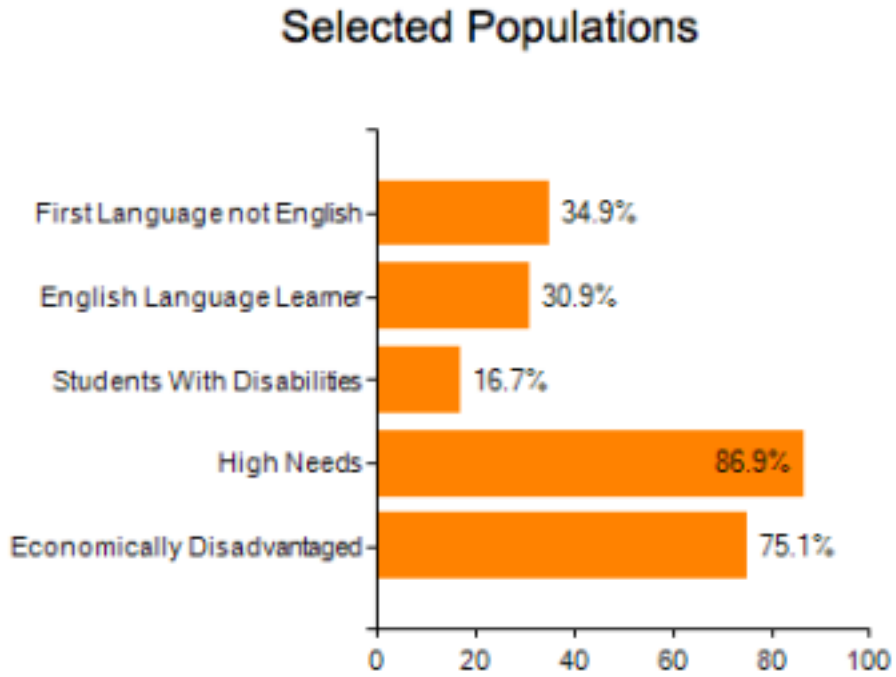
- District level awareness and Plan
- Building and Teacher level awareness and Plan
- What knowledge and materials will you need?
- How will your teachers and students engage with the principles and practices?
- What implications might this integration have on your classrooms?

Getting to know FTG Elementary School

- ★ Public School
- ★ Enrollment 510 - 515
- ★ PK - 4,
- ★ Teacher:Student Ratio 14:1 v. 13.1 Dist/State
- ★ Title 1 School
- ★ Year 1 TAG
- ★ PBIS Year 2

- ★ Named in honor of first foreign born governor of Massachusetts.
- ★ FTG product of LPS
- ★ Level 3 TAG awarded in the amount of $600,000.00





Greenhalge School Vision

"All students will meet or exceed grade level learning standards"

To reach our vision, we will:

- Build a school culture based on the principles of ***effective effort*** as well as ***academic*** and ***social responsibility***.
- Collaborate with ***families*** to achieve ***student and school goals***.
- Engage in ***professional learning communities*** to improve student learning by:
- Analyzing ***data*** to plan instruction, ***set goals/targets*** and monitor progress to ensure students' success.
- Delivering ***relevant*** and ***engaging curriculum*** that is aligned with the standards.
- Providing ***targeted instruction*** by highly qualified staff.

Greenhalge School Mission Statement

We strive to provide a safe, supportive school community where all students are challenged by a rigorous curriculum. Our school and families work together to ensure that all students attain high academic standards, think critically, solve problems, demonstrate accountability for their learning and become productive and contributing members of our school community.

Turn Around Plan Rationale (TAP)

Turnaround Practice #2:

Intentional Practices for Improving Instruction

Shared Expectations and Consistent Implementation of Instructional Practices

- *Concept Development in All Content Areas:* During instruction, teachers will implement the Six Principles of Effective Pedagogy to improve concept development. 100% of teachers will implement a minimum of three principles per lesson throughout daily instruction. These principles include:
  - **Joint Productive Activity (JPA)**
  - **Language & Literacy Development (LLD)**
    - Contextualization (CTX)
    - Challenging Activities (CA)
    - Instructional Conversations (IC)
    - Critical Stance (CS)

Phase-In Process (2015, Teemant & Tyra): Part of our Rationale

Five Phases	Standards	PHASE MOTTO:
PHASE ONE: ● The teacher establishes classroom community and classroom values or norms. ● The teacher teachers, models, and practices procedures, norms, and routines daily. ● The teacher establishes the pattern of using briefings and debriefings to introduce and reinforce behavioral expectations and solve problems that emerge in the community. ● The teacher conducts various baseline assessments of students. ● The teacher floats to assist, and students work individually, with partners, or in small groups.	**LLD** **JPA** CXT CA IC **CS**	Let's Get Peppy!: Digging Deeper Into Six Principles of Effective Pedagogy: Joint Productive Activity (JPA) Snowball Activity Tuesday PD - Oct.

SEI Six Principles of Effective Pedagogy Lesson Plan Template 2017 - 2018

Grade Level Team: _____ **Date:** _____ **Principle:** _____JPA_____

Unit/Lesson Title	Content Objective(s)	Language Objective(s)

Content Standards	Practices Standards: Role of Student	Six Principles: Role of Teacher

Content/Language Objectives **Tiered Vocabulary** ☐ POSTED? *What words are selected for each tier?*	Tier I:
	Tier II:
	Tier III:
	Connection to mentor text: *(How is this connected to the mentor text?)*

Common Misconceptions	Higher Order Thinking Questions

Concept Development		
Concrete	**Pictorial/Semi-abstract**	**Abstract**

Joint Productive Activity (This list is not exhaustive) ❑ *Quick Write* ❑ *Data Analysis* ❑ *Jigsaw* ❑ *Iceberg Activity* ❑ *Corners Activity* ❑ *Mix and Match* ❑ *Snowballs* ❑ *Gallery Walks* ❑ *Analyzing Text* ❑ *Vocabulary Roundtable* ❑ *Write Around* ❑ *Language Experience Approach*	**Do Now:**
	Launch:
	Explore:
	Summary:

SEI Six Principles of Effective Pedagogy Lesson Plan Template 2017 - 2018

	Evidence of Student Learning:

Lesson Reflection or suggestions for future implementation/improvement/aspects that went well:

Snowball Activity

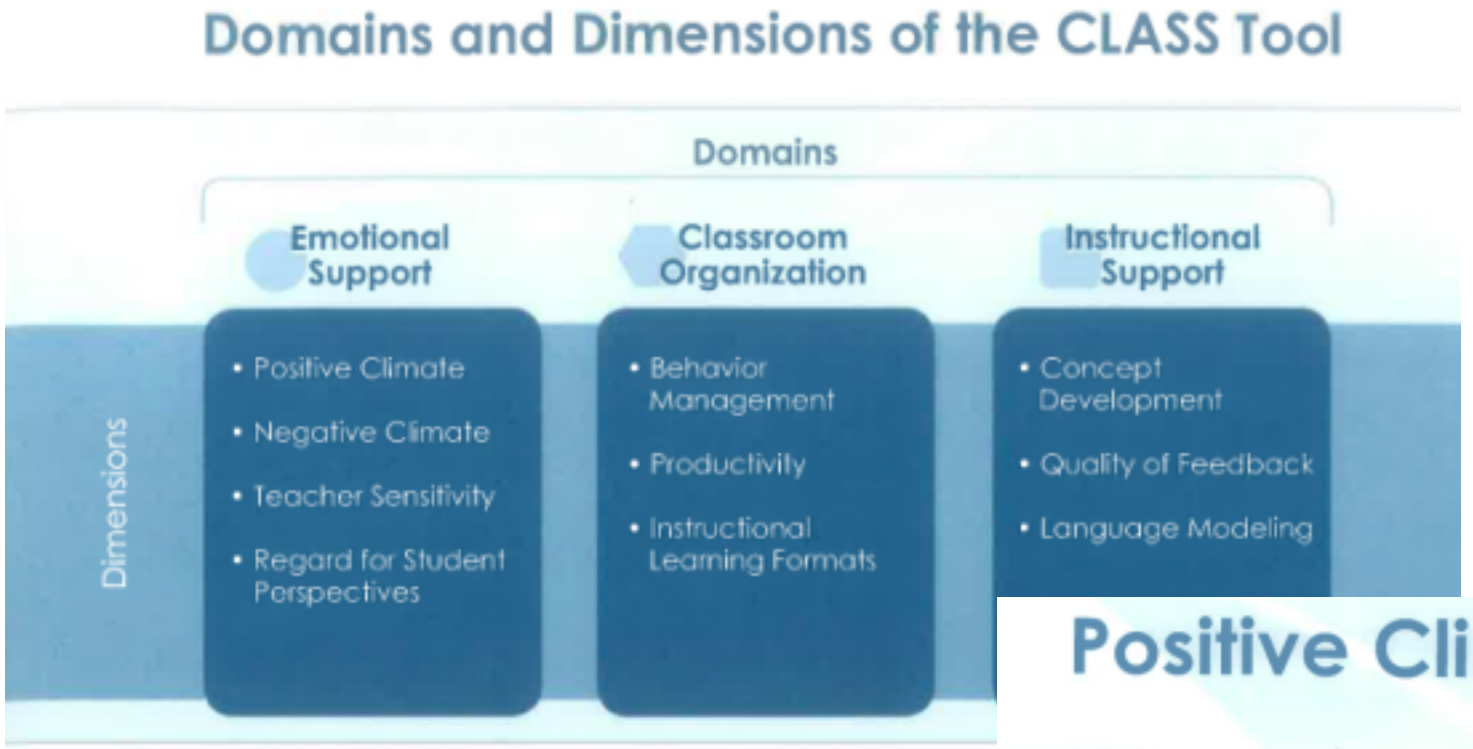
Snowball Activity:

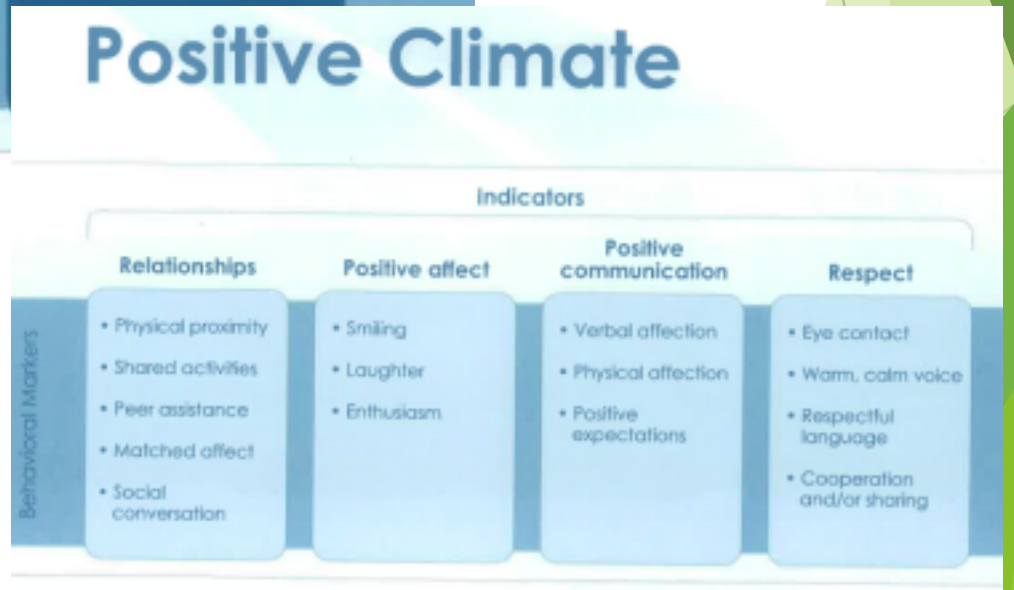
1. Take a blank sheet of paper
2. Record or draw ONE thing you recall.
3. Take your sheet of paper and crumple it into a ball.
4. Toss your Snowball across the room. (1 min)
5. Take a new snowball, open it up , read, and record ONE more idea.
6. Repeat until we have at least 2 - 3 ideas listed.
7. Share

Welcome to the CLASS Observation Tool: Dimensions Guide

- What is the CLASS?
  - focus on effectiveness of interactions among T:S, quality of interactions promote social cog.dev.
- What does the CLASS tool Measure?
  - Emotional Support, Classroom Organization, instructional Supports
- How do we know that the CLASS tool measures effective teaching?
  - Research in over 1000s of classrooms, higher the score higher the gains in learning

Domains and Dimensions of the CLASS Tool





Greenhalge CLASS Average Ratings for Each Dimension 2017

Instructional Support Domain = 3.2

Concept Development Dimension = 2.7
Quality of Feedback Dimension = 3.4
Language Modeling = 3.6

Appendix C. Overview of Schoolwide Instructional Observations

Table 1. Summary Table of Average Ratings for Each Dimension in Classrooms

This table shows an overview of schoolwide instructional observation data from the *Schoolwide Instructional Observation Report*. For descriptions of the domains and indicators, please refer to the full report in Appendix F.

	Low Range		Middle Range			High Range		Average Scores*
	1	2	3	4	5	6	7	
Emotional Support Domain			**9**	**10**	**19**	**21**	**21**	**5.4**
Positive Climate			3	4	4	7	2	5.1
Negative Climate**					1	2	17	6.8
Teacher Sensitivity				3	5	10	2	5.6
Regard for Student Perspectives			6	3	9	2		4.4
Classroom Organization Domain			**1**	**2**	**16**	**25**	**16**	**5.9**
Behavior Management			1	1	4	14		5.6
Productivity					1	6	13	6.6
Instructional Learning Formats				1	11	5	3	5.5
Instructional Support Domain	**1**	**15**	**21**	**15**	**8**			**3.2**
Concept Development		10	7	2	1			2.7
Quality of Feedback	1	2	7	8	2			3.4
Language Modeling		3	7	5	5			

*The school average is an average of the scores. For example, for Positive Climate, the s
as: ([3 x 3] + [4 x 4] + [5 x 4] + [6 x 7] + [7 x 2]) ÷ 20 observations = 5.1

**Negative Climate is rated on an inverse scale. An original score of 1 is given a value o
reflects the normalized adjustment: ([5 x 1] + [6 x 2] + [7 x 17]) ÷ 20 observations = 6.8

Greenhalge CLASS Average Ratings for Each Dimension 2018

Instructional Support Domain = 4.4

Concept Development Dimension = 4.1
Quality of Feedback Dimension = 4.7
Language Modeling = 4.5

Summary of Average Ratings

Table 12. Summary Table of Average Ratings for Each Dimension in Classrooms, Grades Pre-K–4

	Low Range		Middle Range			High Range		Average Scores*
	1	2	3	4	5	6	7	
Emotional Support Domain			**2**	**9**	**16**	**14**	**35**	**5.9**
Positive Climate				1	4	6	8	6.1
Negative Climate**						1	18	6.9
Teacher Sensitivity				2	5	4	8	5.9
Regard for Student Perspectives			2	6	7	3	1	4.7
Classroom Organization Domain				**3**	**14**	**17**	**23**	**6.1**
Behavior Management					3	4	12	6.5
Productivity				1	2	6	10	6.3
Instructional Learning Formats				2	9	7	1	5.4
Instructional Support Domain			**11**	**17**	**24**	**5**		**4.4**
Concept Development			6	7	5	1		4.1
Quality of Feedback			2	4	11	2		4.7
Language Modeling			3	6	8	2		4.5

*The school average is an average of the scores. For example, for Positive Climate, the school average is computed as: ([4 x 1] + [5 x 4] + [6 x 6] + [7 x 8]) ÷ 19 observations = 6.1

**Negative Climate is rated on an inverse scale. An original score of 1 is given a value of 7. The scoring in the table reflects the normalized adjustment: ([6 x 1] + [7 x 18]) ÷ 19 observations = 6.9

	Common Core State Standards for Mathematical Practice	Social and Emotional Learning Competencies
SMP 3 — Construct viable arguments and critique the reasoning of others.	Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They ***justify their conclusions, communicate them to others, and respond to the arguments of others.*** They ***reason inductively about data, making plausible arguments that take into account the context from which the data arose***. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can ***listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments***.	***To anticipate how students' own arguments may be interpreted and received, take on the perspectives of others*** Social awareness ***Think meta-cognitively and organize their own thoughts with given information*** Self-management ***Understand others' perspectives to effectively interpret their arguments*** Social awareness ***Listen actively to further explore the arguments of others*** Relationship skills

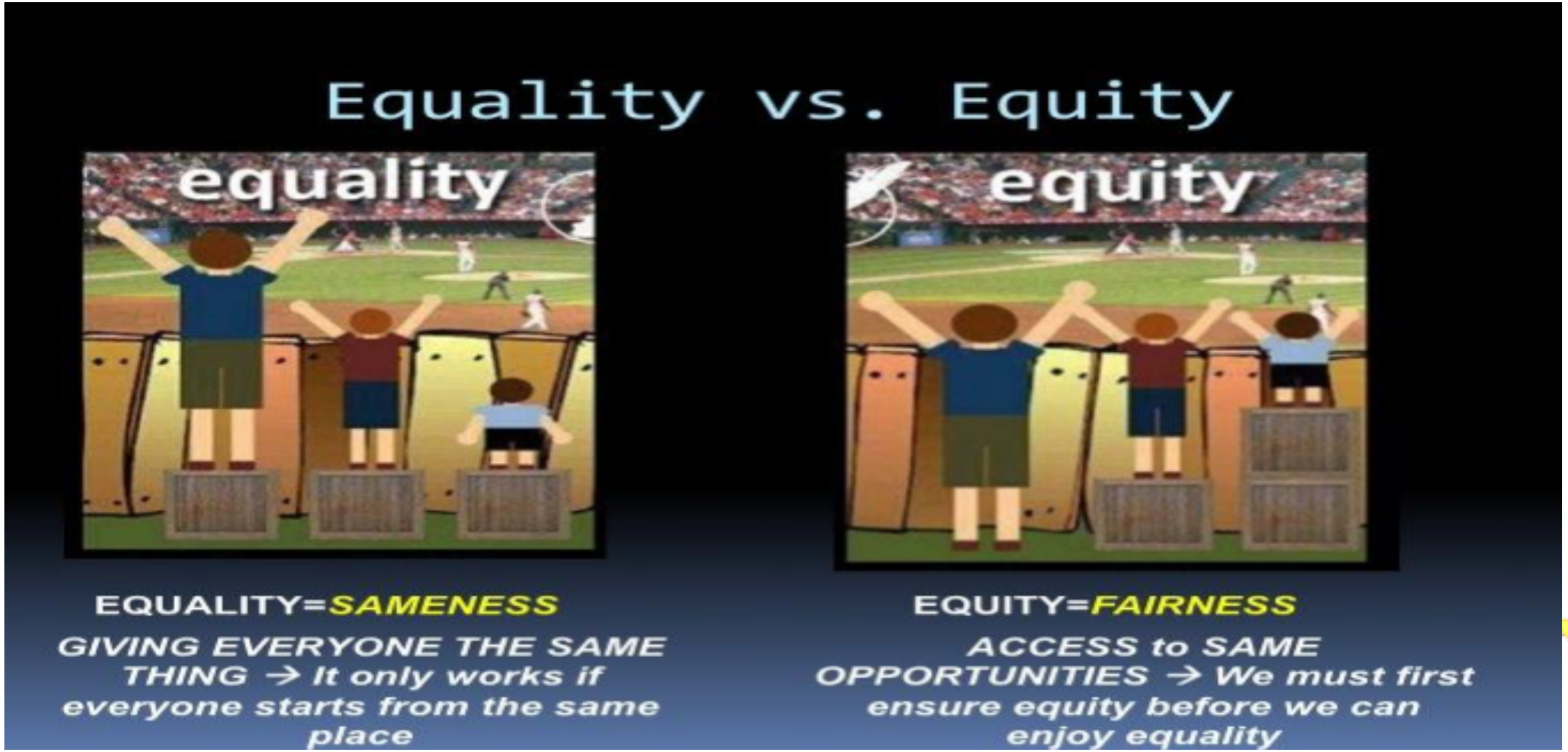
Alignment of Taxonomies Incorporating the Standards for Mathematical Practices

New Bloom's Taxonomy	Cognitive Demand Mathematics	Standards of Mathematical Practice	Six Standards of Effective Pedagogy	Social Emotional Standards
Remembering	**Level One** Memorize Facts, Definitions & Formulas	SMP 1 SMP 2 SMP 6	**LLD** **CTX**	
Understanding	**Level Two** Perform Procedures	SMP 1 SMP 2	**JPA** **CTX**	
Applying	**Level Three** Demonstrate Understanding of Mathematics	SMP 1 SMP 2 SMP 4	**JPA** **LLD** **CTX** **CA**	
Analyzing	**Level Four** Conjectures, Analyze, Generalize, Prove	SMP 1 SMP 3 SMP 4 SMP 5 SMP 8	**JPA** **LLD** **CA** **IC**	
Evaluating	**Level Five** Solve Non-Routine Problems, Make Connections	SMP 1 SMP 2 SMP 3 SMP 4 SMP 5 SMP 6 SMP 7 SMP 8	**JPA** **LLD** **CTX** **CA** **IC** **CS**	
Creating				

Next Steps:

1. ILT will meet to discuss learning from Pre-conference PD
2. ILT will would like to consider accelerating integration
3. Summer School Pilot of LLD and August School Based PD in the works!

Equality vs. Equity



MP 1: Make sense of problems and persevere in solving them.

Mathematically Proficient Students:

- Explain the meaning of the problem to themselves
- Look for entry points
- Analyze givens, constraints, relationships, goals
- Make conjectures about the solution
- Plan a solution pathway
- Consider analogous problems
- Try special cases and similar forms
- Monitor and evaluate progress, and change course if necessary
- Check their answer to problems using a different method
- Continually ask themselves "Does this make sense?"

ARIZONA

COMMON CORE STATE STANDARDS INITIATIVE

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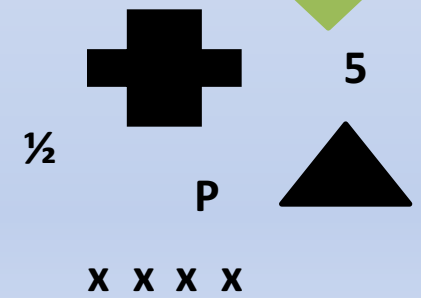
MP 2: Reason abstractly and quantitatively

Decontextualize

Represent as symbols, abstract the situation

Mathematical Problem



Contextualize

Pause as needed to refer back to situation

Tucson educator explains SMP #2
Skip to Min 5

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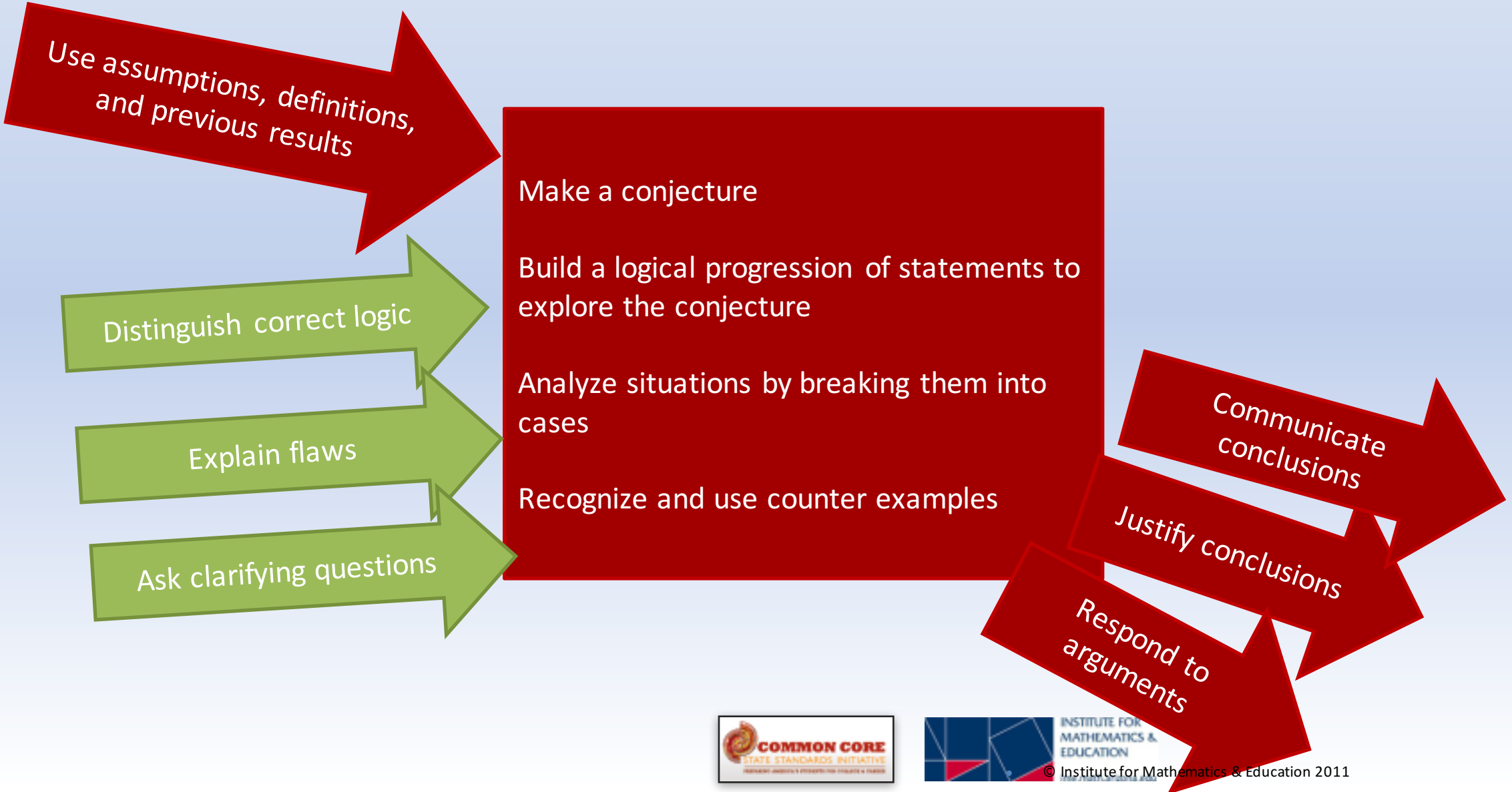
MP 3: Construct viable arguments and critique the reasoning of others



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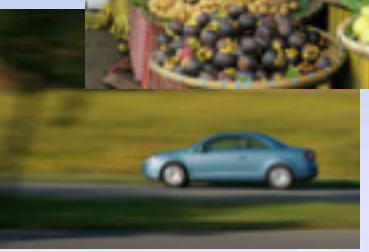
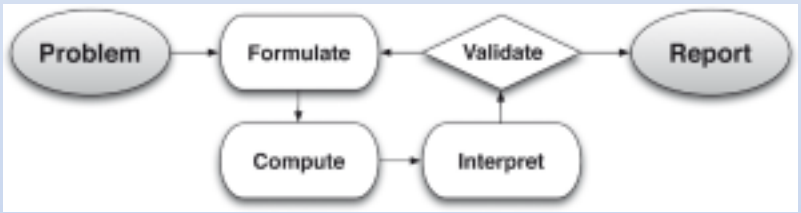
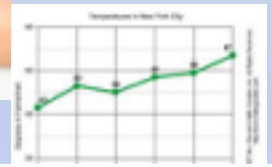
MP 4: Model with mathematics

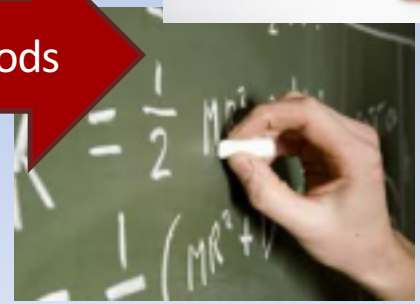


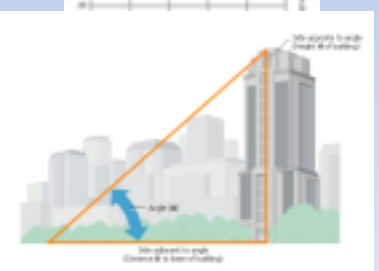
Problems in everyday life…

…reasoned using mathematical methods









Mathematically proficient students

• make assumptions and approximations to simplify a situation, realizing these may need revision later

• interpret mathematical results in the context of the situation and reflect on whether they make sense

Images: http://tandrageemaths.wordpress.com, asiabcs.com, ehow.com, judsonmagnet.org, life123.com, teamuptutors.com, enwikipedia.org, glennsasscer.com

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MP 7: Look for and make use of structure

Mathematically proficient students

- look closely to discern a pattern or structure
- step back for an overview and shift perspective
- see complicated things as single objects, or as composed of several objects

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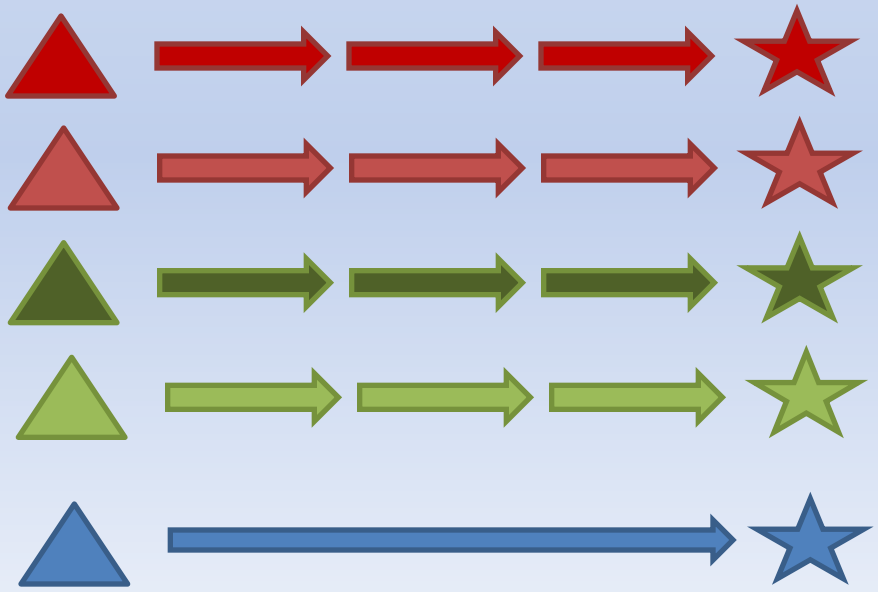
MP 8: Look for and express regularity in repeated reasoning

Mathematically proficient students

- notice if calculations are repeated and look both for general methods and for shortcuts
- maintain oversight of the process while attending to the details, as they work to solve a problem
- continually evaluate the reasonableness of their intermediate results



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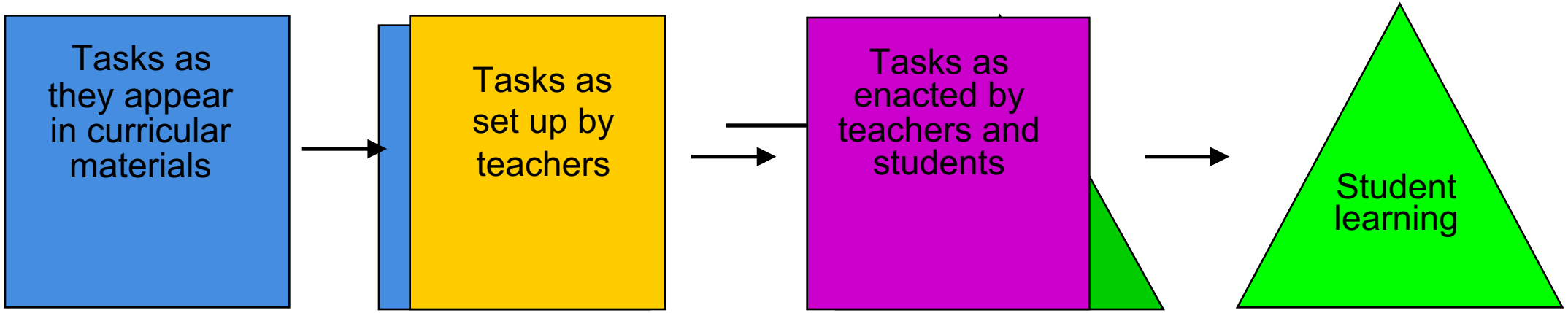
But, what teachers **do** with the tasks matters, too!

The Mathematical Tasks Framework



Stein, Grover & Henningsen (1996)
Smith & Stein (1998)
Stein, Smith, Henningsen & Silver (2000)

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