

Assess, Address & Advance:

A Unique Approach to Change the Paradigm in Our Classroom

San Marcos USD, June 2017



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The Math Projects Journal
Temecula Valley USD



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@MathProjects

#BootCampMath

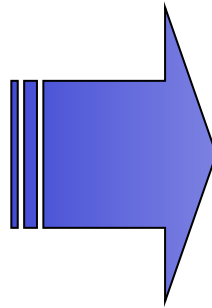


What is Your Million-Dollar Talent?



The Mindset Shift

Fixed
Mindset



Growth
Mindset

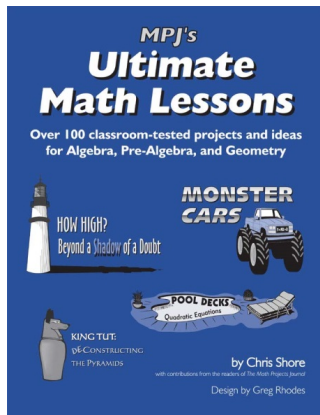


*They are that smart
&
We are that good!*



... of the teachers!

What I've Been Up To...



Problem Identified



Dan Meyer

@ddmeyer

“Kids don’t flunk current content; they flunk past content.” @MathProjects makes his case for numeracy and #clotheslinemath. #CMCMath

**Students don’t flunk current content;
they flunk prior content!**



Problem Expected



Standards are written as if all students have mastered 100% of the previous standards. No where in the world does that truly happen.



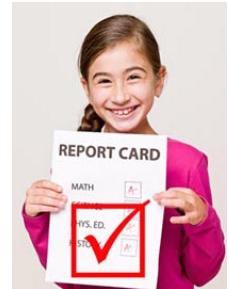
Problem Predicted



Build Number Sense...



...intentionally!



ALL people have the capacity to read, but it does not occur naturally...
Think of math in the same way.

Assessing, Addressing and Advancing “Those Kids”

We need...

Brain Surgery (a Paradigm Shift)

Information, Confirmation, Affirmation

They need...

No-Options
Engagement

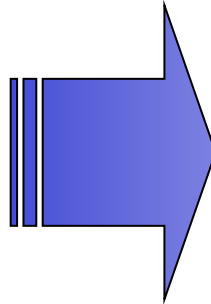
Boot Camp
Numeracy

H.
O.
T.
S.

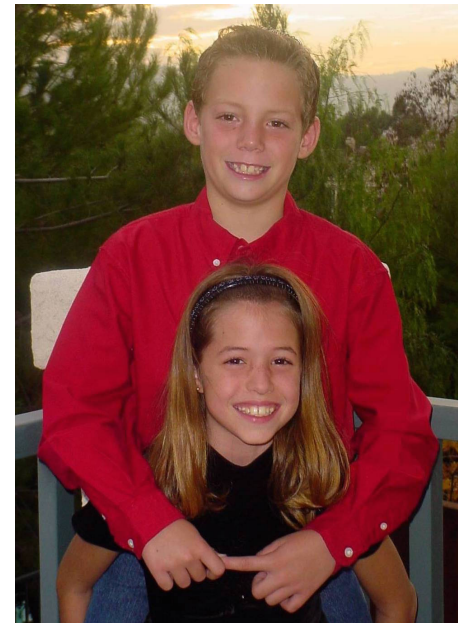


The Paradigm Shift

“Students are
solely
responsible.”



Coach's Mind Set



Parent's Mind Set

**Emotional
Investment**

Assessing, Addressing and Advancing “Those Kids”

No-Options
Engagement

Boot Camp
Numeracy

H.
O.
T.
S.



Boot Camp

Refresh, Refine & Accelerate ...

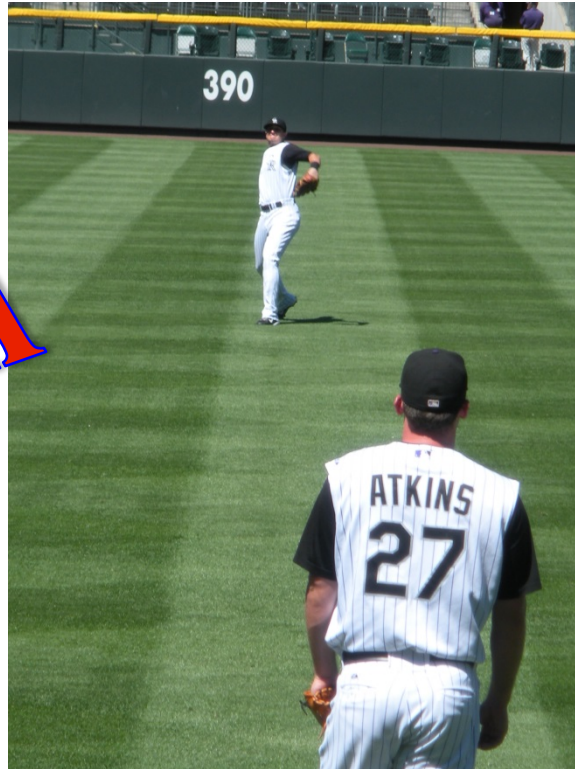
pre-requisite skills ...

before each lesson, week or unit.

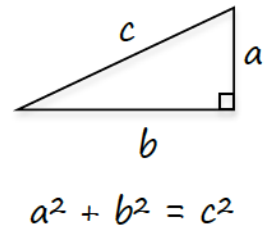
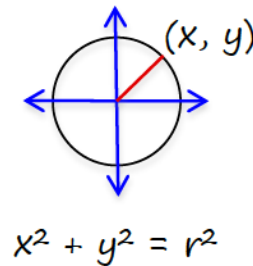


Fundamentals are Key ...

... and need to be practiced regularly!



Refresh

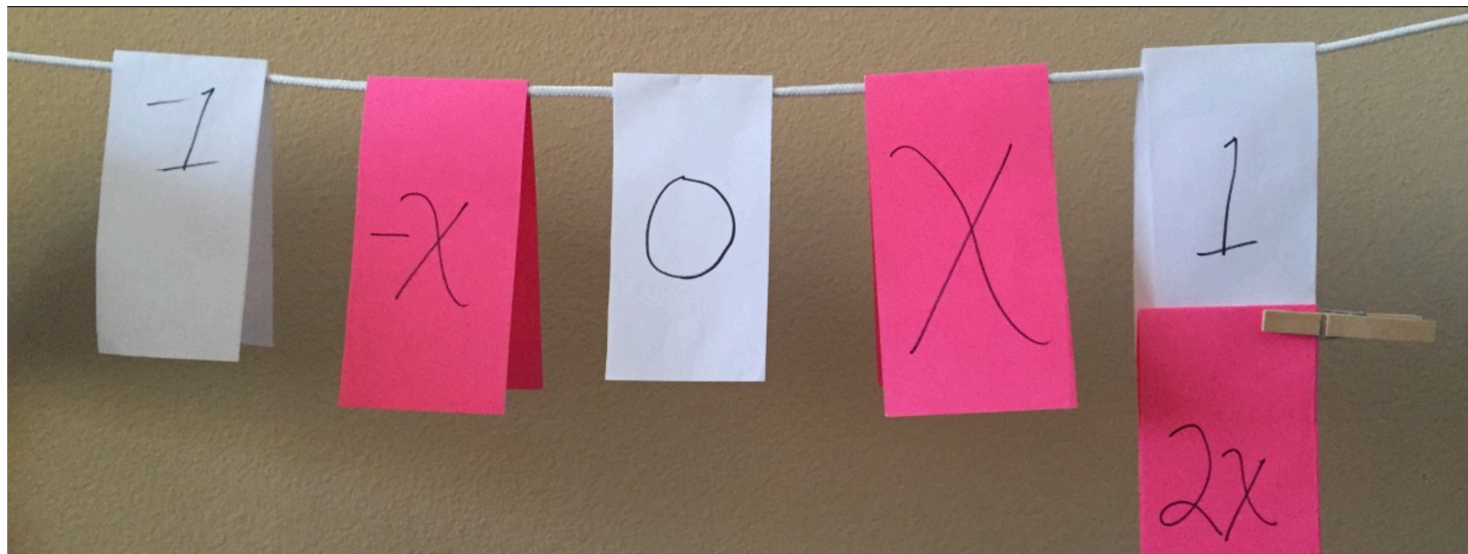


So Warm-Up with them.



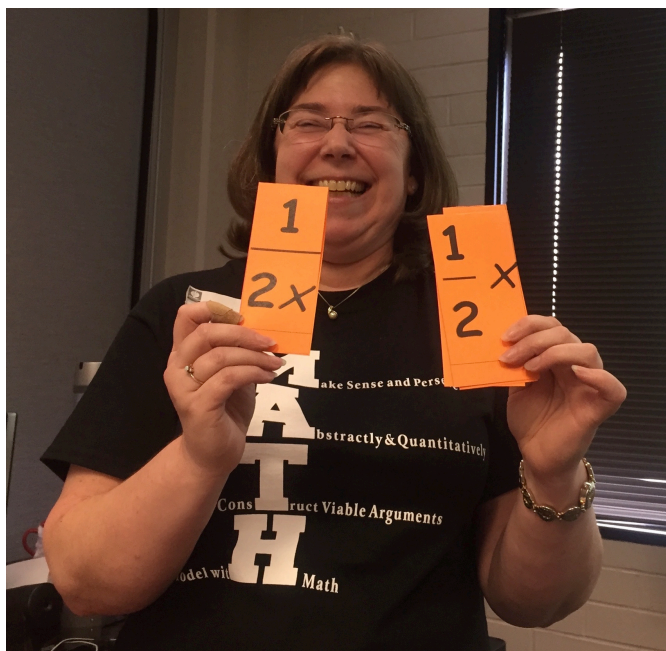
Clothesline Math

The Master Number Sense Maker!



Clothesline Math

A Brief History



Molly Daley

@mdaley15

I've just been Clotheslined or maybe kicked in the head.

[@MathProjects](#) #55thNWMC

Clothesline Math

Warm-Up

$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$
---------------	---------------	---------------

Clothesline Math Handout



Name: _____
Date: _____



For each set, record the given values, expressions or drawings. After the discussion of their placement on the clothesline, record them on the number line.

1. _____, _____, _____



Discussions, Deductions & Decisions



Clothesline Math

Order of Operations

-3^2	$(-3)^2$	$-(3)^2$
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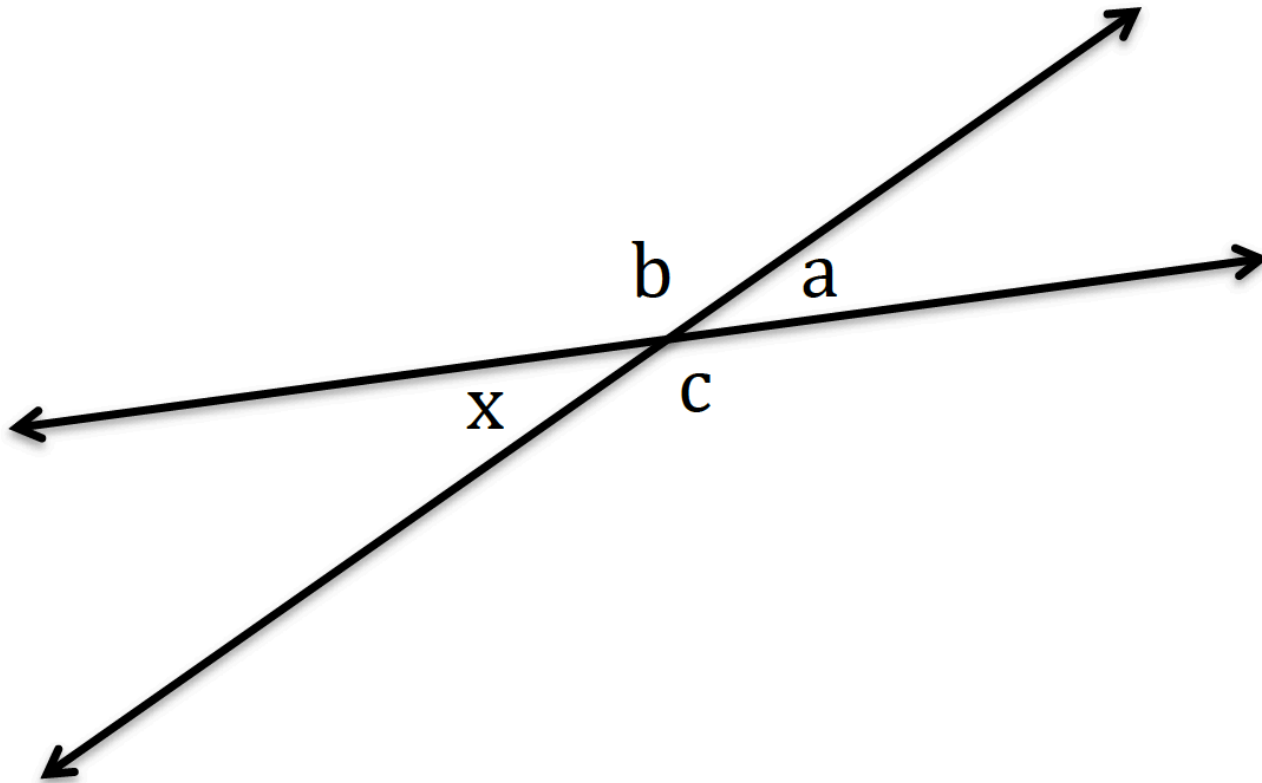
Clothesline Math

Expressions

$-x$	$x+1$	$x+2$
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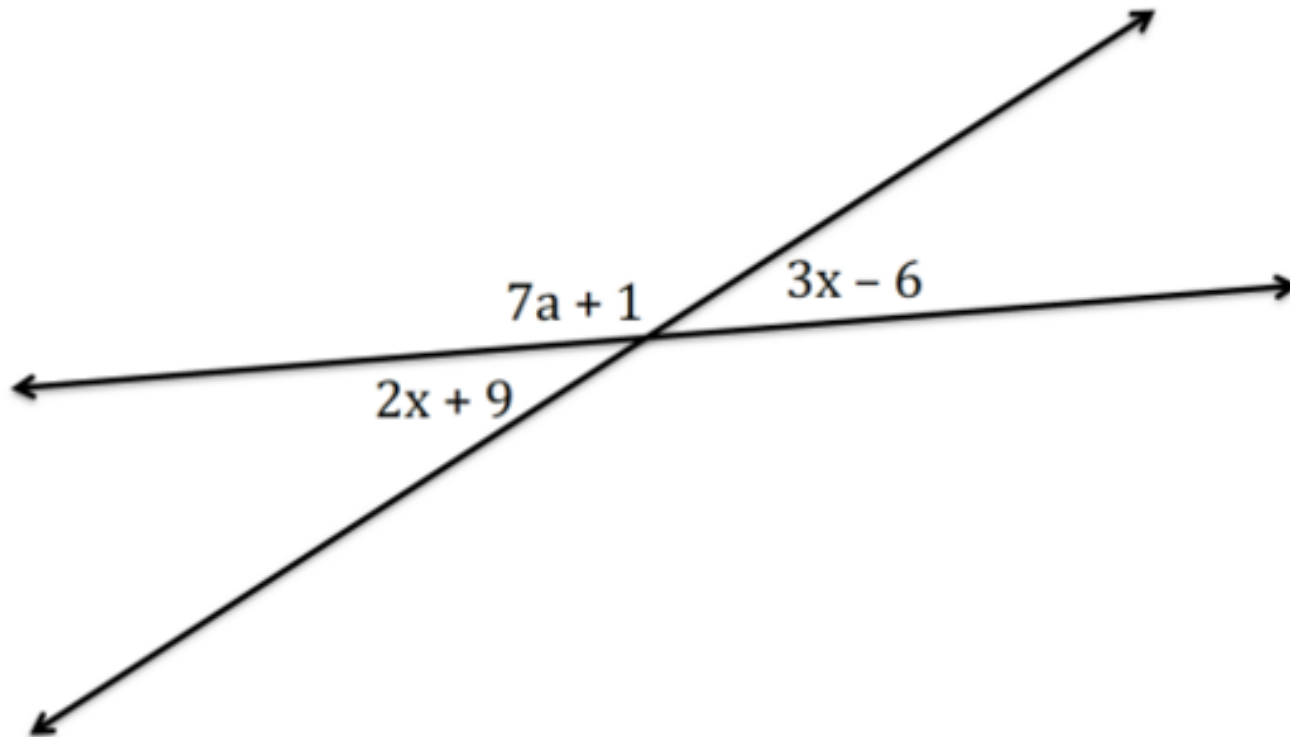
Clothesline Math

Linear Pairs



Clothesline Math

Vertical Angles



Clothesline Math

Slopes

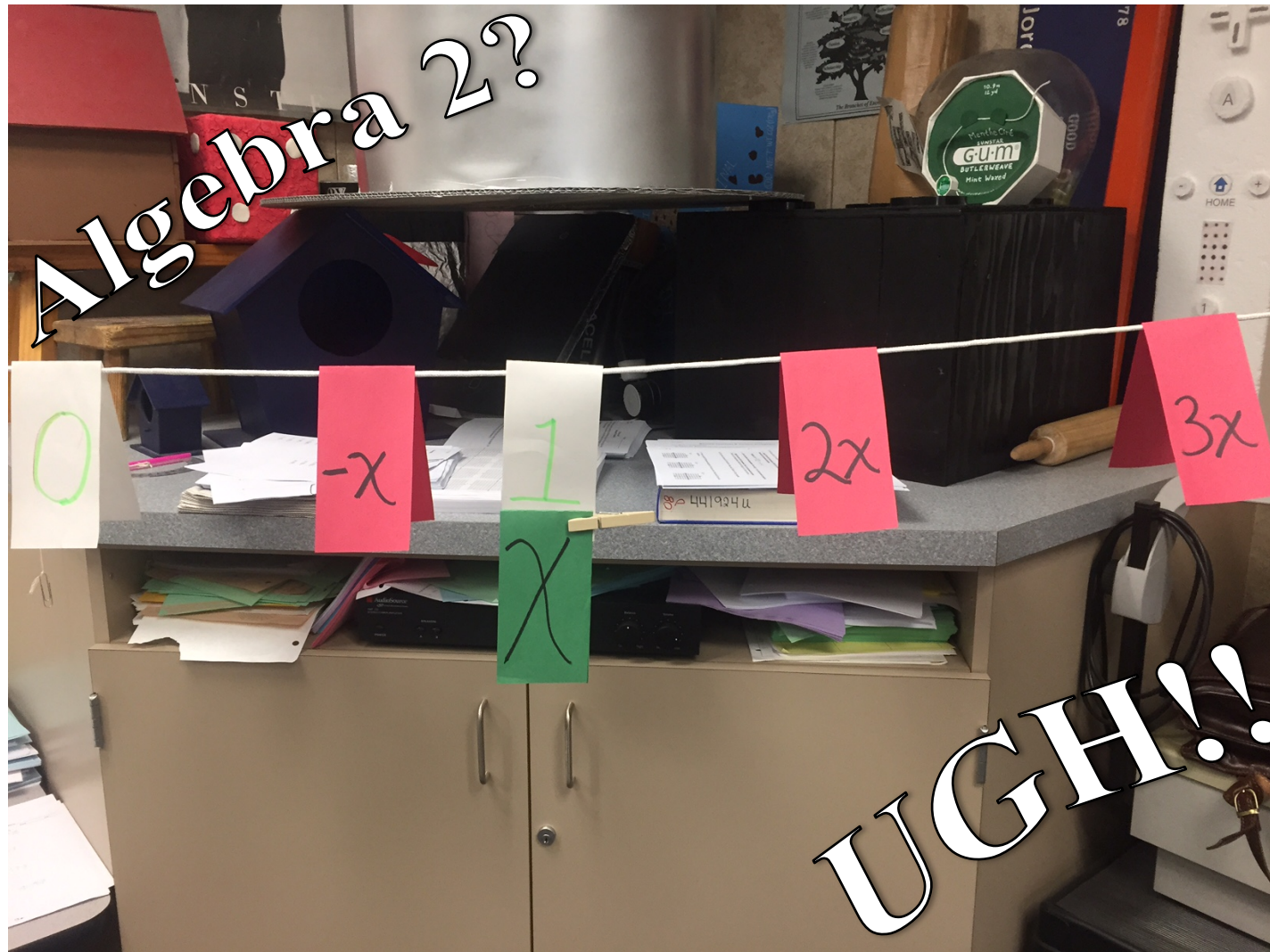
m	$m_{ }$	$m_{\perp}$
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Clothesline Math

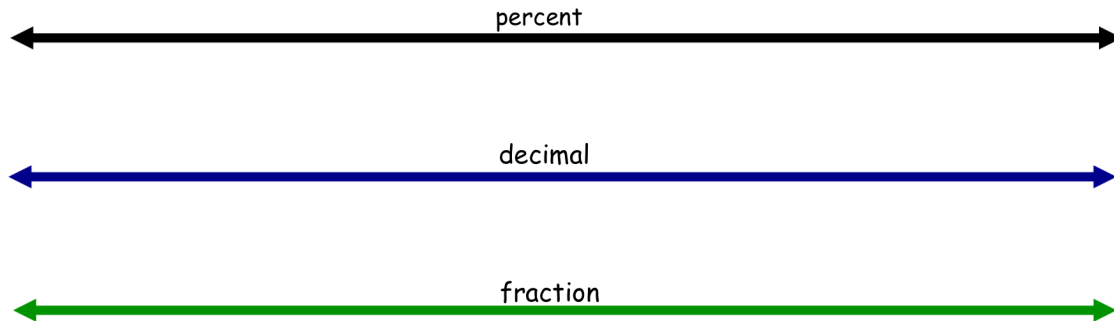
Statistics

Med	Q_1	Q_2
-----	-------	-------

Clothesline Revelations



Clothesline Math for warm-ups



0.75	$\frac{1}{2}$	$\frac{1}{4}$	75%	0.5	0%
0	0	1	1	50%	100%
	0.25	$\frac{3}{4}$		25%	

Clothesline Math as Review



$$\sqrt[3]{8}$$

$$25^{\frac{1}{2}}$$

$$-2.5$$

$$5^{-2}$$

$$(-2)^0$$

$$\frac{3}{2}$$

$$\sqrt{2}$$

$$73\%$$

$$16^{\frac{1}{4}} + 32^{\frac{1}{5}}$$

$$4^{\frac{3}{2}}$$

$$-0.08$$

$$-\sqrt{3}$$

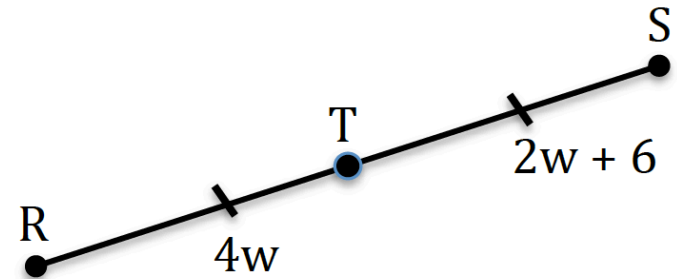
$$8^{-\frac{1}{3}}$$

$$\sqrt{42}$$

Clothesline Math

on assignments

31. a. W, RT, TS, RS



Clothesline Math on assessments

- 9) Given that $\frac{a}{b} = \frac{c}{d}$, $a \neq c$, and the position of a & b on the number line below, show a possible placement of c & d .



www.clotheslinemath.com



Clothesline Math

The Master Number Sense Maker

[Home](#)

[Blog](#)

[Making the Clothesline](#)

[Benchmarks](#)

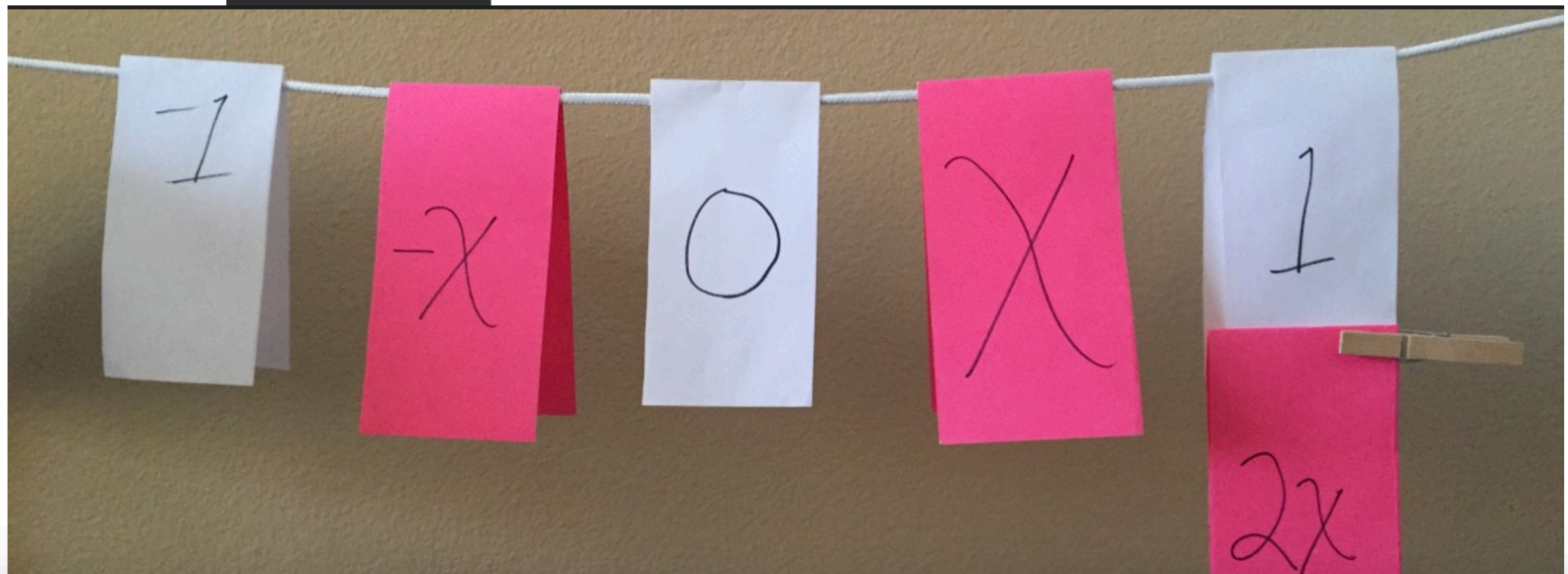
[Numbers](#)

[Algebra](#)

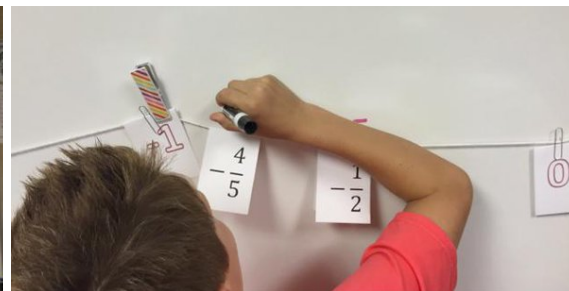
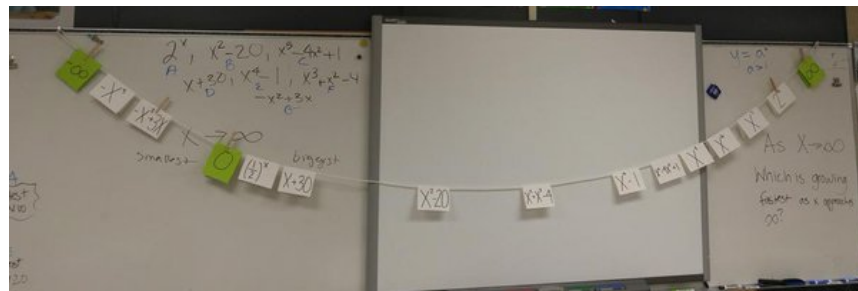
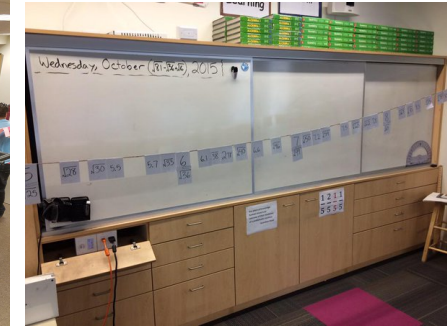
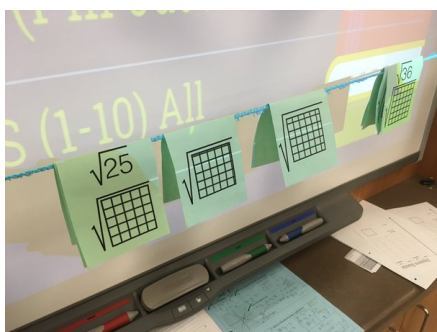
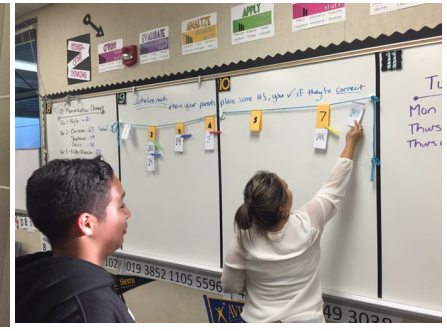
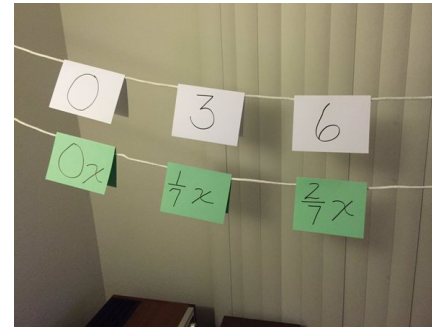
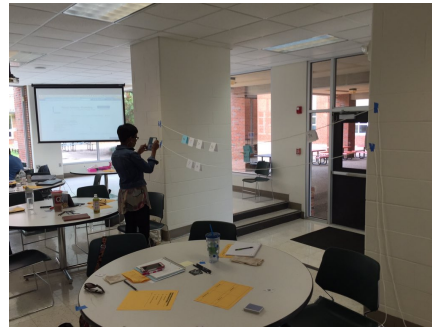
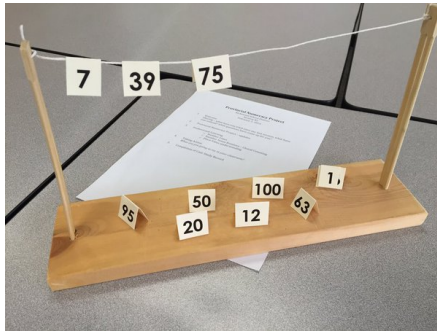
[Functions \(graphs\)](#)

[Geometry](#)

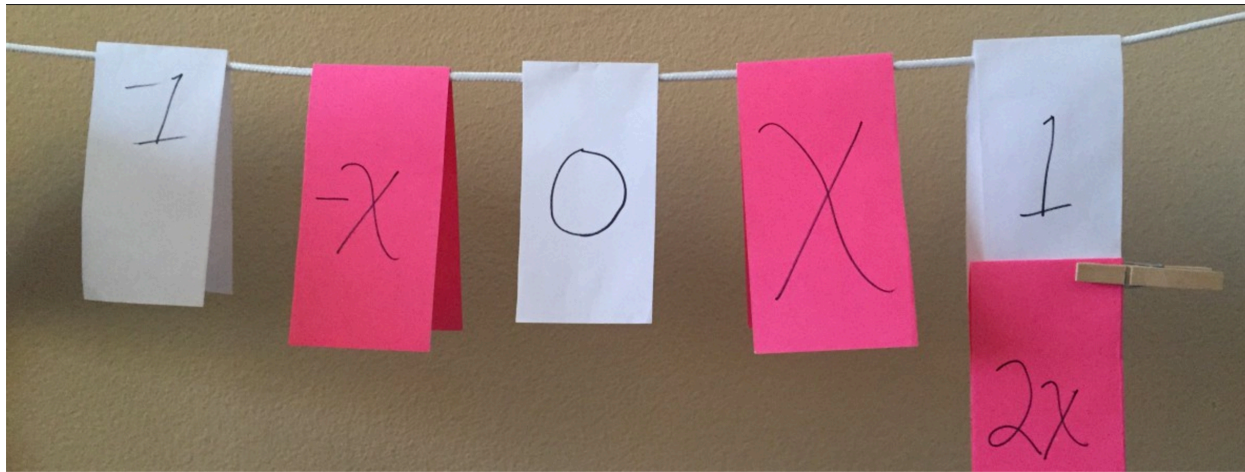
[Statistics](#)



Clothesline Math Around the Nation



Why Clothesline Math?



The Intervention Paradigm

Case Study:

Algebra Team Pre-Assessed w/
Textbook Resources: **15% Failed**

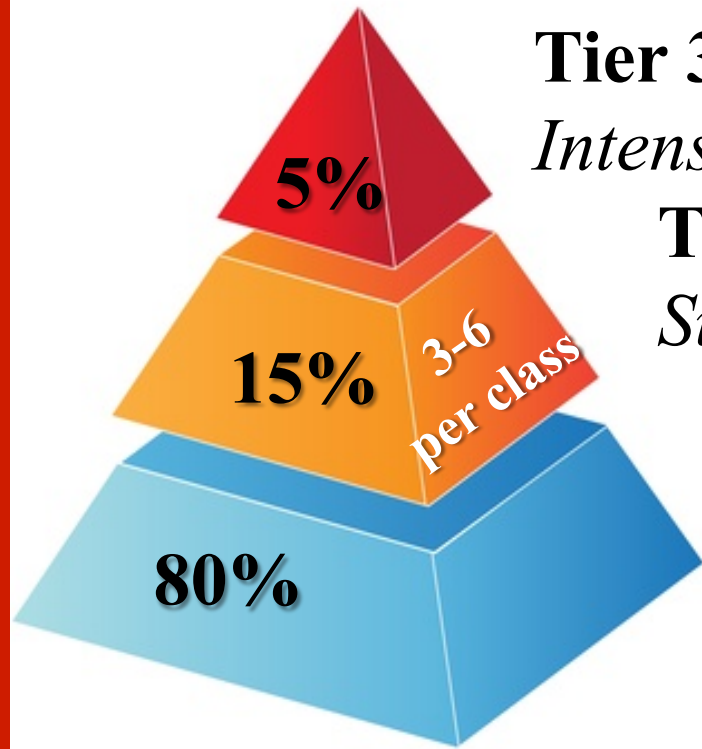
3-Day, 20-Min Intervention, then
Post Test: **85% of those Passed**



What are your pre-req's?

Acceleration
= Extra
Work
Double UP?

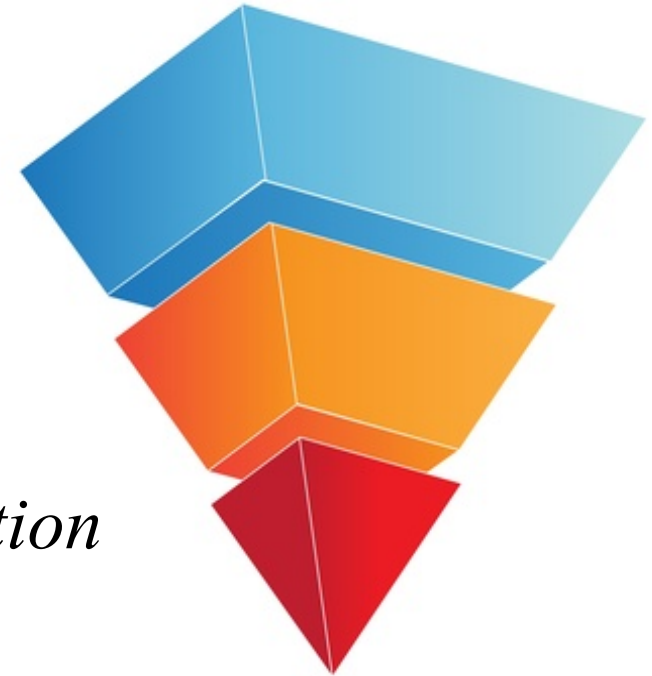
Boot Camp Numbers



Tier 3:
Intensive

Tier 2:
Supplemental

Tier 1:
Core Instruction



Boot Camp: Numeracy

Refresh
Warm-ups

Refine
Numeracy



Accelerate
Intervention
(pre-emptive)



Assessing, Addressing and Advancing “Those Kids”

No-Options
Engagement

Boot Camp
Numeracy

H.
O.
T.
S.



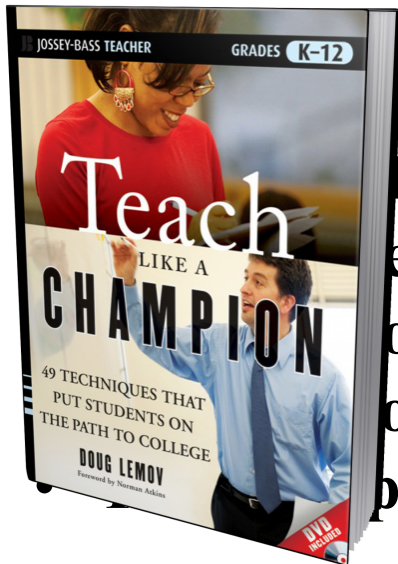
No-Options Engagement

The most loving thing you can do for your students is ...

Demand Their Best Effort

No-Options

(Make failure more painful than success)



ert
Ticke
e Pol
onfer
on
p/Boa



Engage

(No Quiet Deals)

- Int
 - W
 - Ca
 - W
 - Ex
 - Pa
- ssons



No-Options Engagement

❖ No-Options Strategies

- Ticket out the door
- Non-stop harassment
- HW Detention
- Phone Calls/Email
- Supplemental Assignments



❖ Engagement Strategies

- I do/we do/you do
- Chunking
- Stand & Point
- Use Student Response
- Wait for 100% involvement
- Thumb/Finger Votes
- Sticky Note Terror
- Participation Paraphernalia
(Beads, Raffle Tickets, Initials,
Deck of Cards, Seating Chart Dots,
Equity Sticks)

No-Options Engagement

Ryan: What did you prove in class yesterday?

“I am actually intelligent.”

Danielle: What was the great victory yesterday?

“I really can do math.”

Danika: What did Mr. Shore ever do to you?

“Mr. Shore didn’t say anything about my Mom, but I still don’t think I did anything wrong.”

Clemente: EL/SPED ... 7 of 10



Number Tricks



Pick a #	5	-4	$\frac{1}{4}$	x
Mult by 2	10	-8	$\frac{1}{2}$	$2x$
Add 3	13	-5	$3\frac{1}{2}$	$2x + 3$
Subtract twice original #	3	3	3	$2x + 3 - 2x$

simplified: 3

common result: always 3



Number Tricks



Pick a #	5	-4	$\frac{1}{4}$	x
Add 3	8	-1	$3\frac{1}{4}$	$x + 3$
Mult by 2	16	-2	$6\frac{1}{2}$	$2(x + 3)$
Subtract 6	10	-8	$\frac{1}{2}$	$2(x + 3) - 6$
Subtract the original #	5	-4	$\frac{1}{4}$	$2(x + 3) - 6 - x$

simplified: x

common result: **number picked**



Number Tricks

-8

$x+7$

23



Number Tricks

Rediscovered

FACTORING

numbertricks.net



Why Number Tricks?



Assessing, Addressing and Advancing “Those Kids”

No-Options
Engagement

Boot Camp
Numeracy

H.
O.
T.
S.



Explicit Teaching of Thinking

H.O.T.S.

Dr. John Star



“Math does not teach Problem Solving.”

“Only the explicit teaching of thinking teaches thinking.”



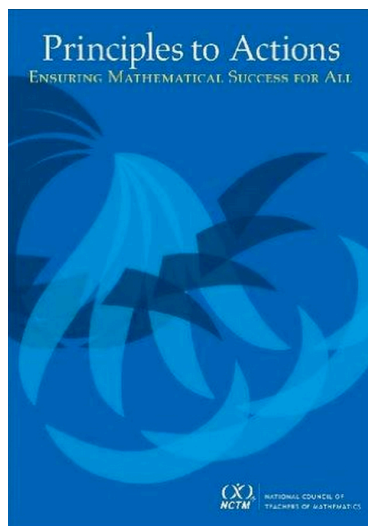
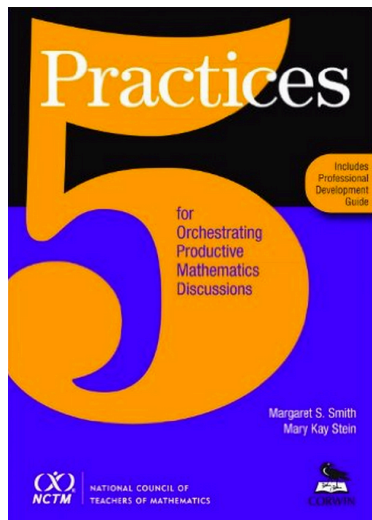
Exercise



Crisis



Teaching Problem Solving



Dr. Peg Smith

“It’s all about the task.
It’s all about the task.
It’s all about the task.”

What is a Task?

“a problem that provides an opportunity to develop mathematical ideas and [thinking].”

-- Adding It Up (2001)

Tasks = Problems used to teach Content & Practices



Tasks Are For Whom?

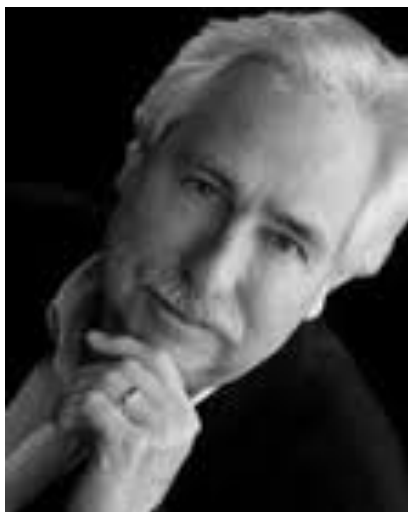
“Accelerated” Remedial Math Students
with Rich & Robust Tasks



Dr. Uri Treisman

ALL Kids!

Dave Foster



50% False Positives
Among 8th Grade Geometry
From CST to SBAC



Practices Posters

Make Sense of Problems and Persevere in Solving Them

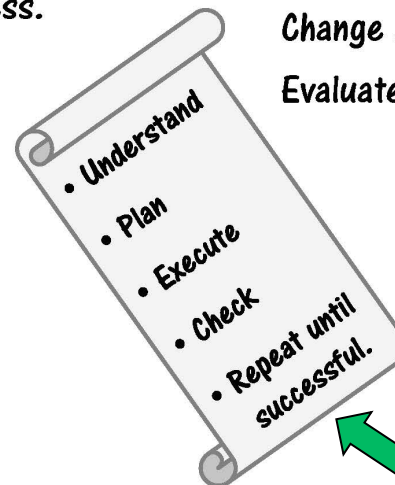


I can understand a problem, devise a strategy, execute a plan and evaluate it's success.

Organize
Strategize
Change Strategies
Evaluate

SOLVE

What exactly is this problem asking of me?
What information do I have?
What information do I need and how do I get it?
What is the best plan?
Is my answer reasonable?
If not how should I change my strategy?



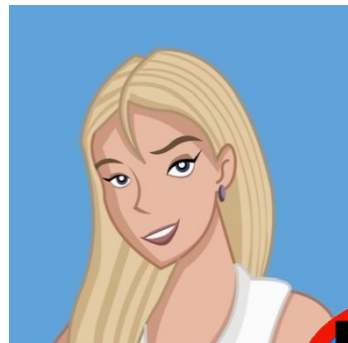
Think and don't give up.

The Math Projects Journal, 2014

Practices Posters



What did these posters teach you about the 8 Standards of Practice?



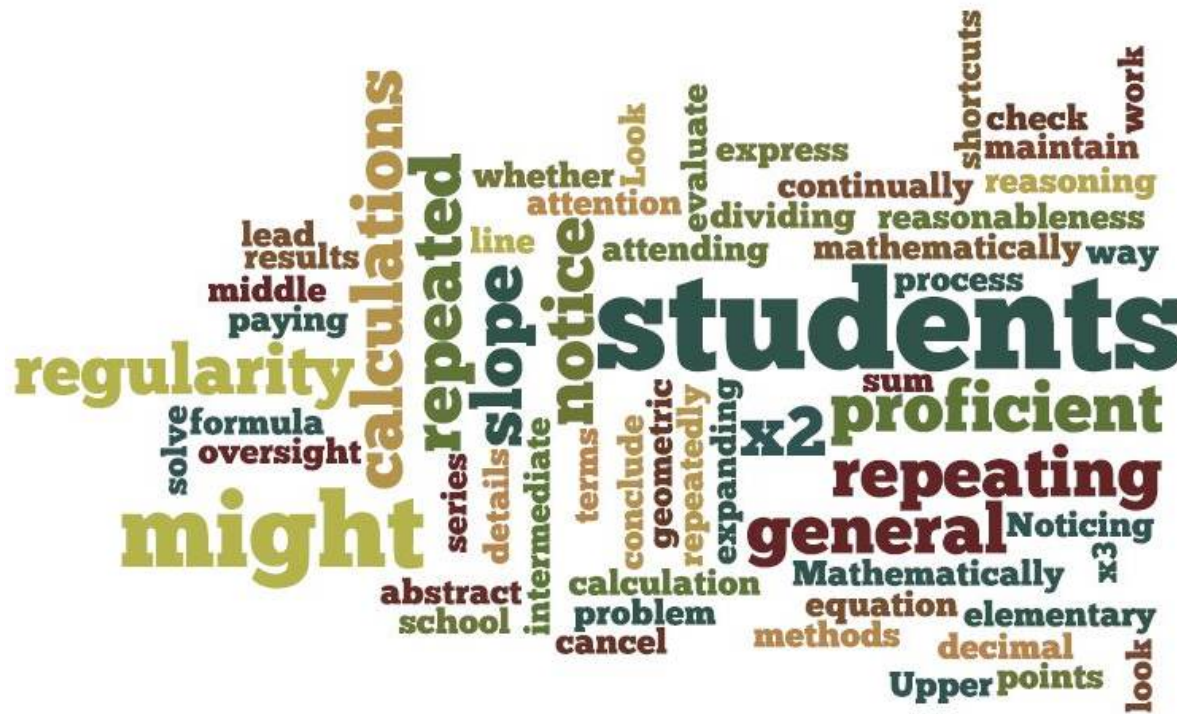
How many of the

8 SMP

do you remember?

Wordle Practices

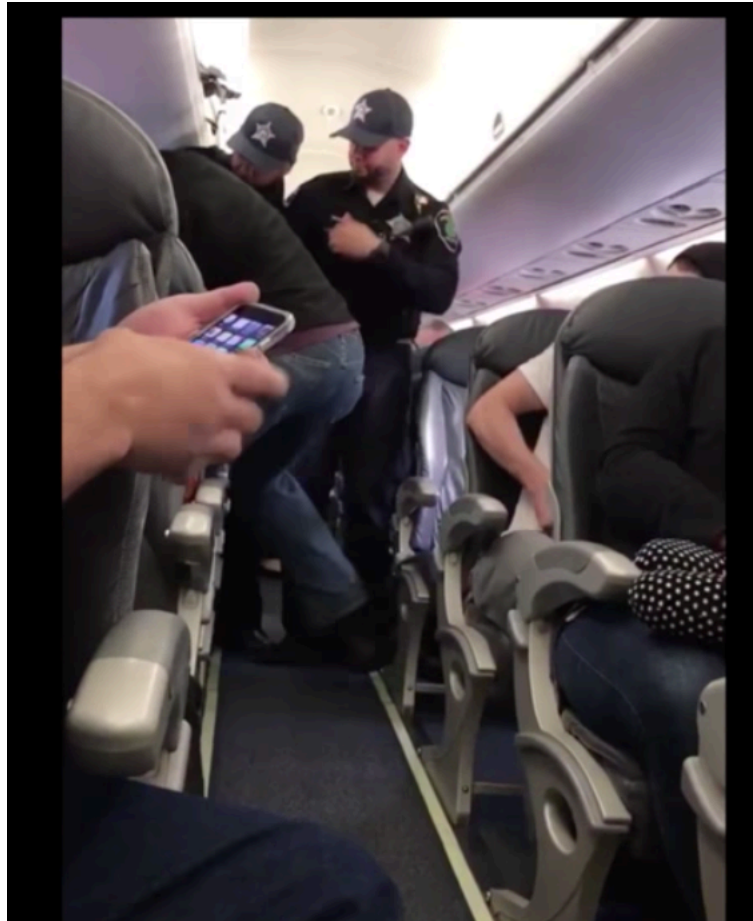
Match the *Wordle* poster to its corresponding CC Standard of Mathematical Practice?



Mathematical Practices

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. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Bumping Airlines



The -Digit Problem

$$8 + 8 + 8 + 8 = 32$$

$$8^2/8 + 88 = 96$$

- Arrange four 8's to create the value 19.

$$88 \div 8 + 8$$

$$8 + 8 + \sqrt[3]{8} + 8^0$$

The -Digit Problem

3)

4) $8^{\circ} + 8^{\circ} + 8^{\circ} + 8^{\circ}$
 $1 + 1 + 1 + 1 = 4$

5) $\sqrt[3]{8} + 8^{\circ} + 8^{\circ} + 8^{\circ} = 5$

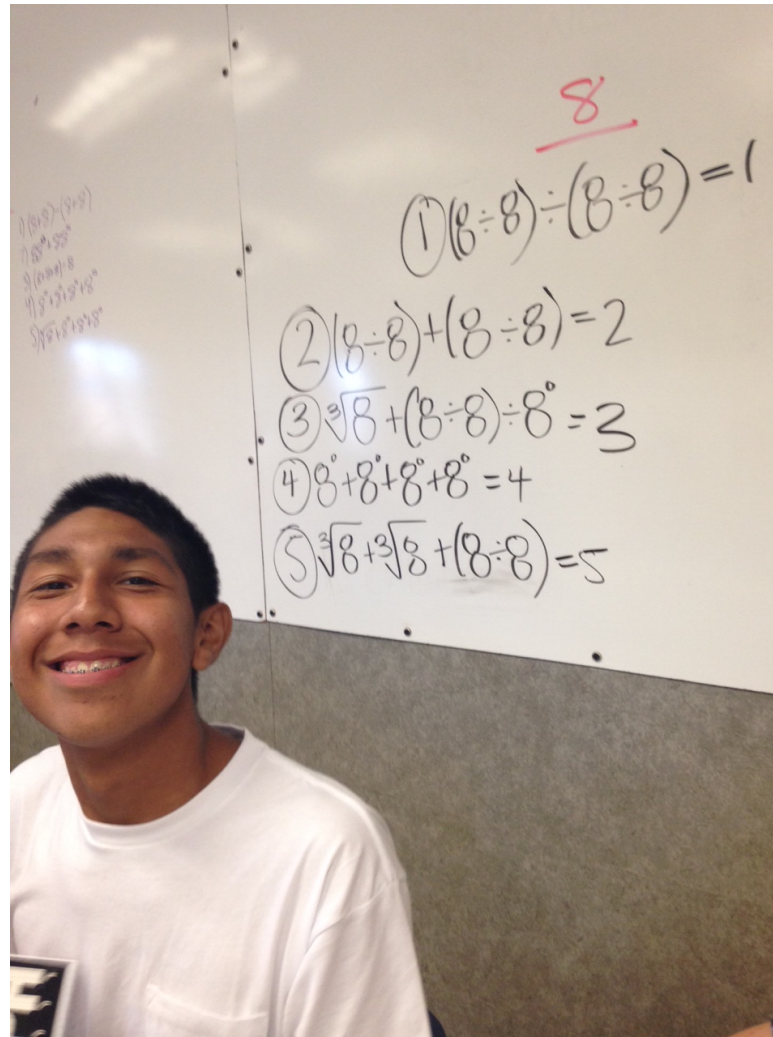
6) $8 - 8^{\circ} \cdot 8^{\circ} \cdot 8^{\circ}$

7) $8 - 8 + 8 - 8^{\circ}$

8) $8^{\circ} \div 8 - 8 + 8$

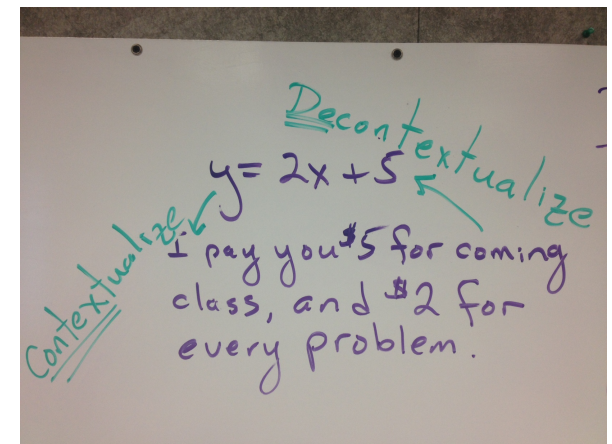
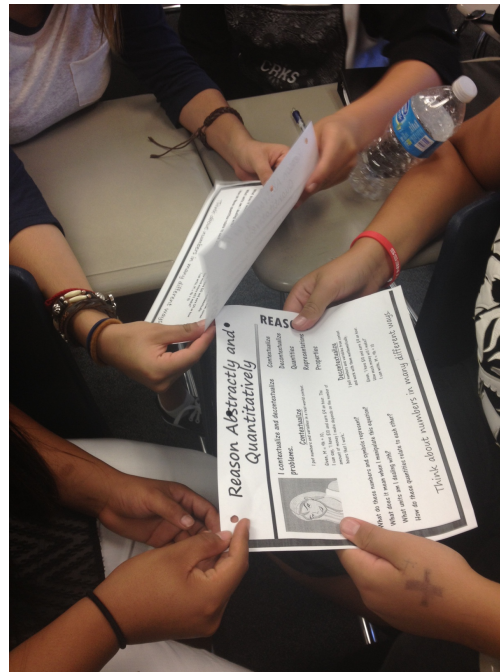
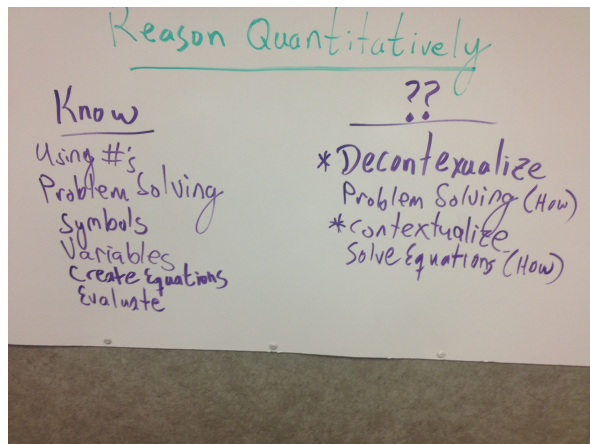
9) $8 + 8 - 8 + 8^{\circ} = 9$ $\left(\frac{88}{8}\right)^{\circ} + 8$

The -Digit Problem

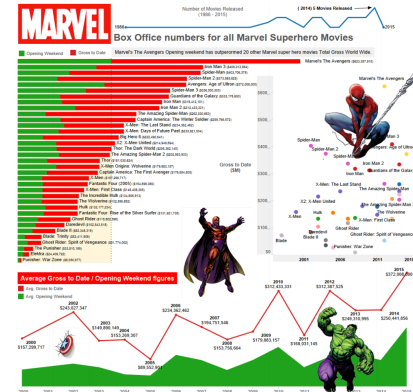
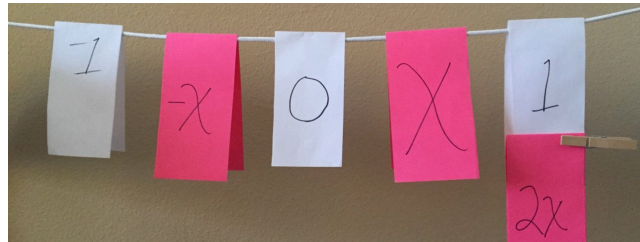


Explicit Instruction through Tasks in Algebra

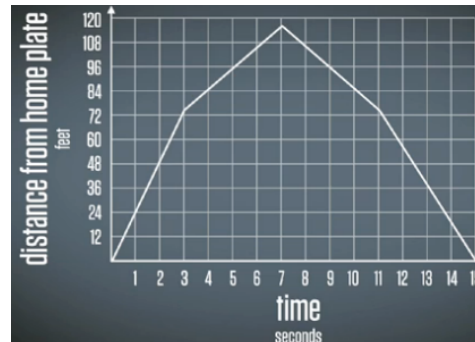
Target: We will use **order of operations** and **quantitative reasoning** to write expressions for a given value.



Other Boot Camp Resources



Refine



Unit Plan

Fail Grandly

No Real Risk



10%

2-Week Rule



Unit Plan

1) Unit Topic

2) Big Ideas

3) Priority Standards (Hug versus Handshake)

4) Common Tasks

5) Pre-Requisite Skills

6) Boot Camp Tasks



Share Out



Declarations

The 1 Thing



The Take-Aways

The Paradigm Shift



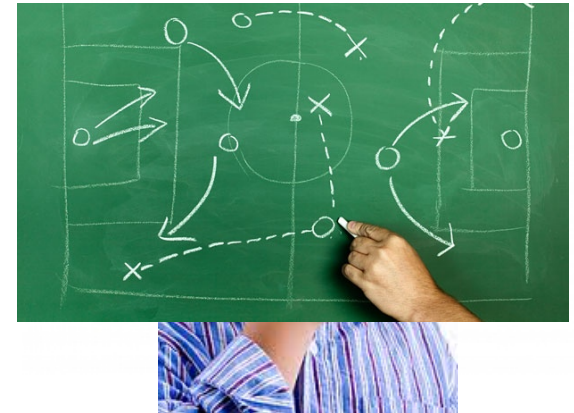
Boot Camp Numeracy



Engagement & H.O.T.S.



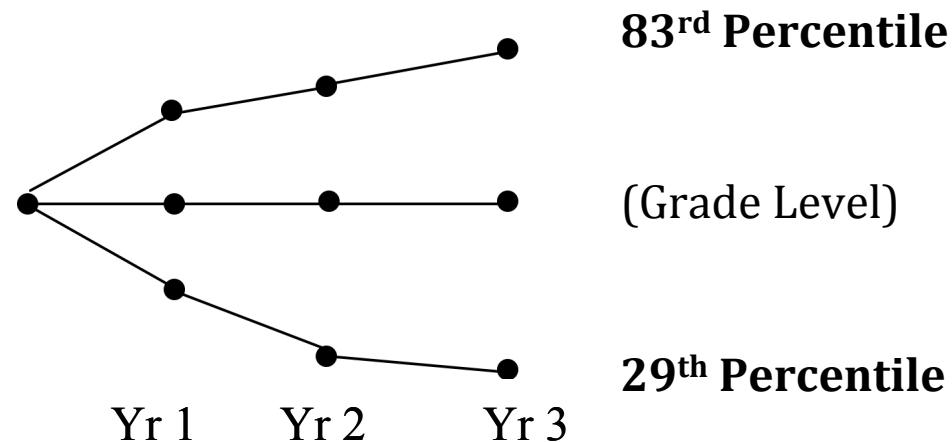
A Plan



Teacher Action is the Difference

“The greatest influence in the quality of the education that a student receives is the decisions that a teacher makes on a daily basis.”

-- Dr. William Schmidt, University of Michigan



Teacher Action is the Difference



Teachers matter most.

-- Dr. William Schmidt, University of Michigan

Teachers matter most.

-- Peg Smith, University of Pittsburgh

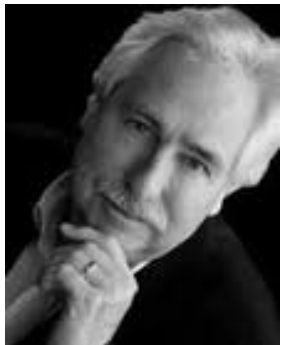


Teachers matter most.

-- Tim Kanold, Adlai E. Stevenson HS, Chicago

Poverty matters ... a lot.

-- Dr. Uri Treisman, University of Texas, Austin



Teachers matter most.

-- David Foster, Silicon Valley Math Initiative, CA

Assess, Address and Advance “Those Kids” with your New Paradigm,

because they are that smart,
and
we are that good,



and because what you do
matters the most.