Assess, Address & Advance:

A Unique Approach to Change the Paradigm in Our Classroom

San Marcos USD, June 2017

Chris Shore

The Math Projects Journal
Temecula Valley USD

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@MathProjects
#BootCampMath

What is Your Million-Dollar Talent?

The Mindset Shift

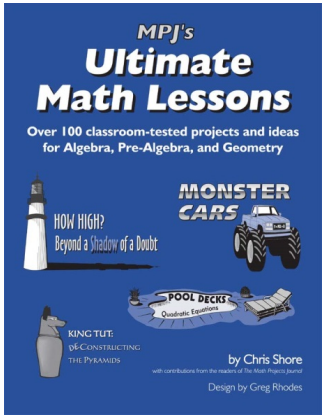
Fixed Mindset

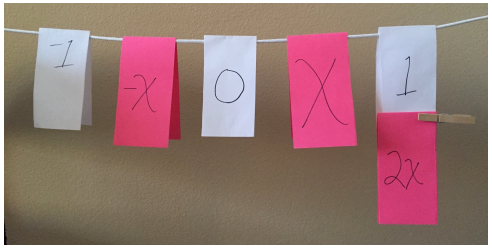
Growth Mindset ….

They are that smart
&
We are that good!

… of the teachers!

What I've Been Up To…





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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.

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Assessing, Addressing and Advancing "Those Kids"

We need…

Brain Surgery (a Paradigm Shift)

Information, Confirmation, Affirmation

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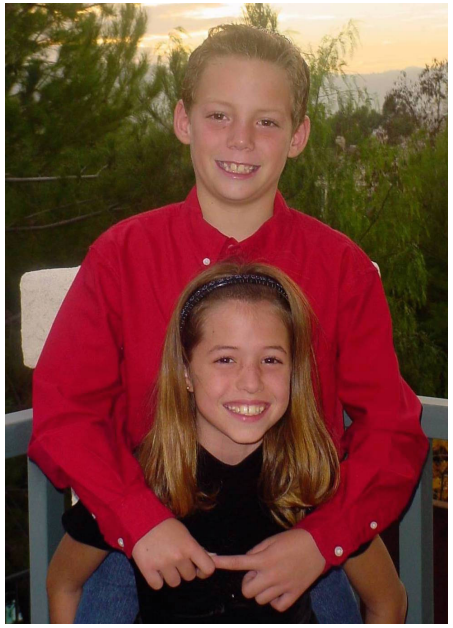
The Paradigm Shift

"Students are solely responsible."

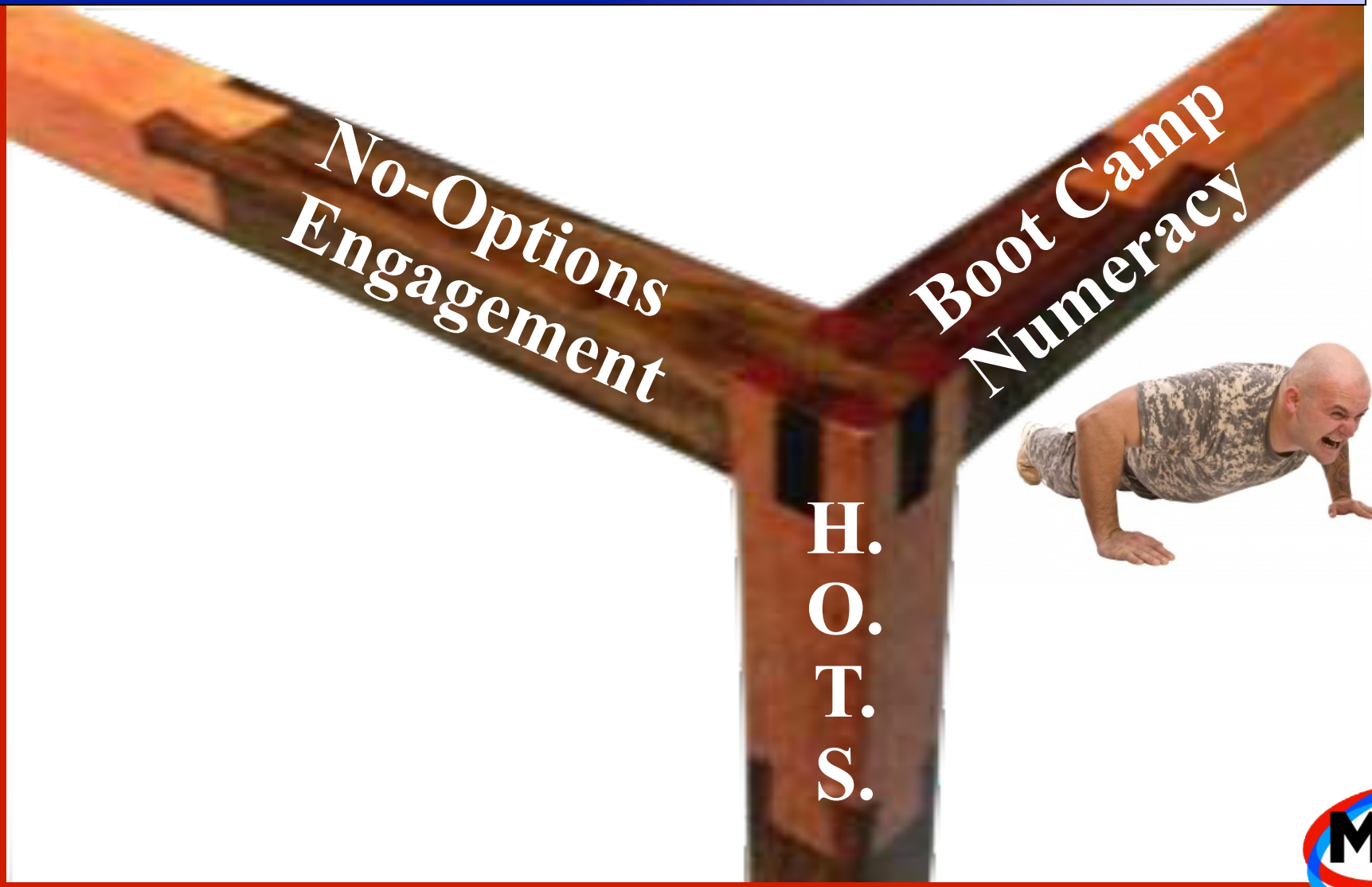
Coach's Mind Set



Emotional Investment

Parent's Mind Set

Assessing, Addressing and Advancing "Those Kids"



Boot Camp

Refresh, Refine & Accelerate …

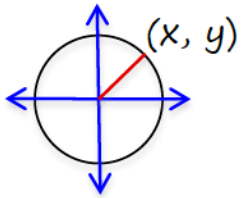
pre-requisite skills ...

before each lesson, week or unit.

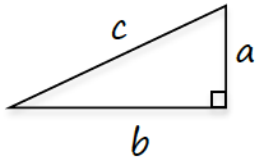
Fundamentals are Key …

… and need to be practiced regularly!

Refresh



$x^2 + y^2 = r^2$

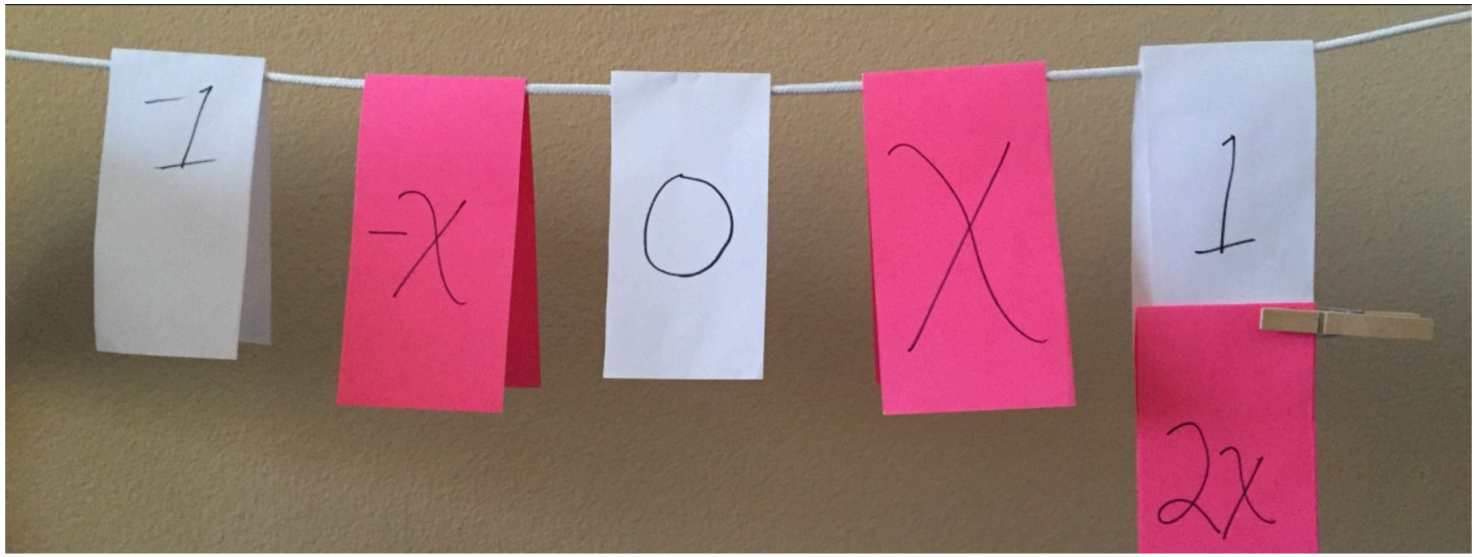


$a^2 + b^2 = c^2$

So Warm-Up with them.

Clothesline Math

The Master Number Sense Maker!



#clotheslinemath

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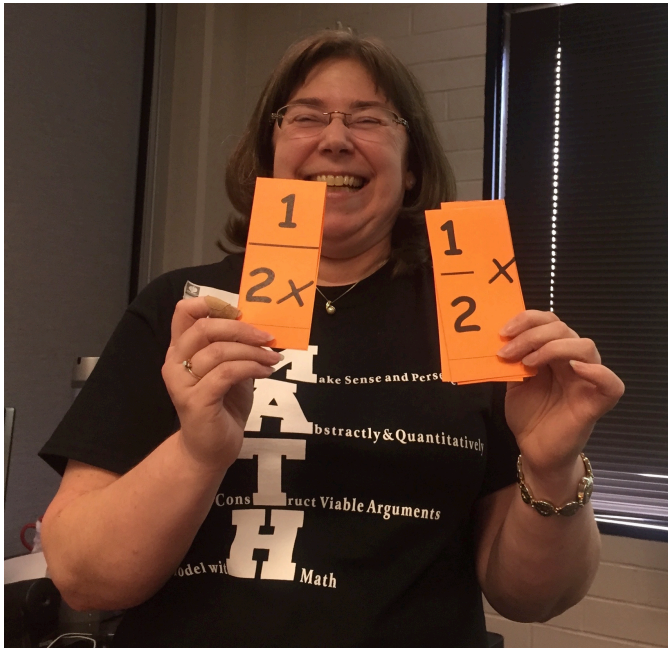
Clothesline Math

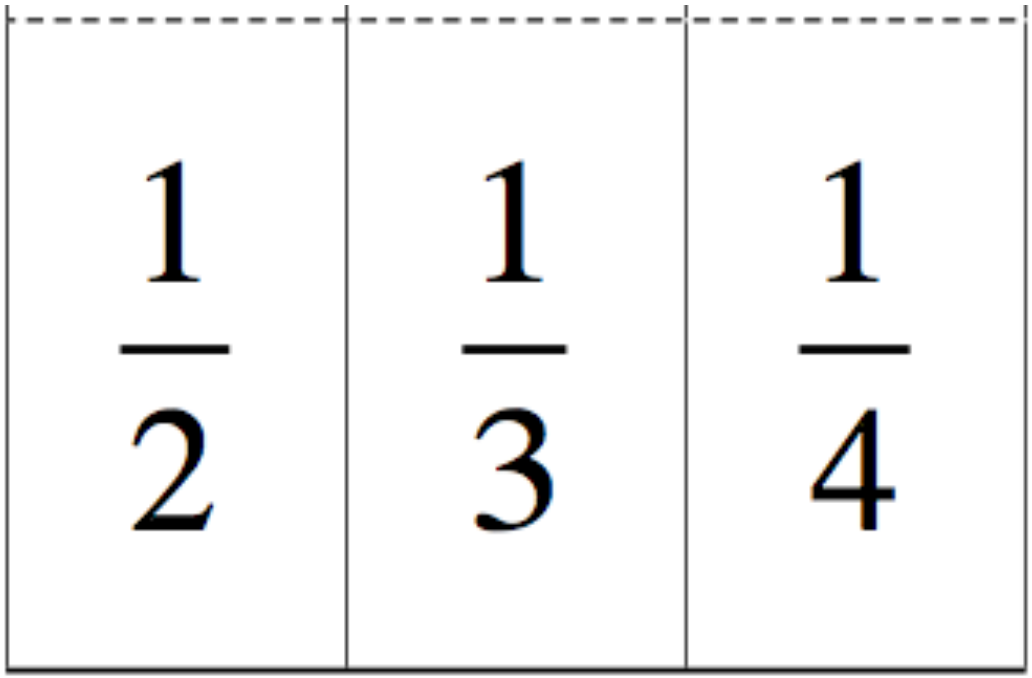
A Brief History



Molly Daley
@mdaley15

I've just been Clotheslined or maybe kicked in the head. @MathProjects #55thNWMC

Clothesline Math Warm-Up



Clothesline Math Handout

The Clothesline

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

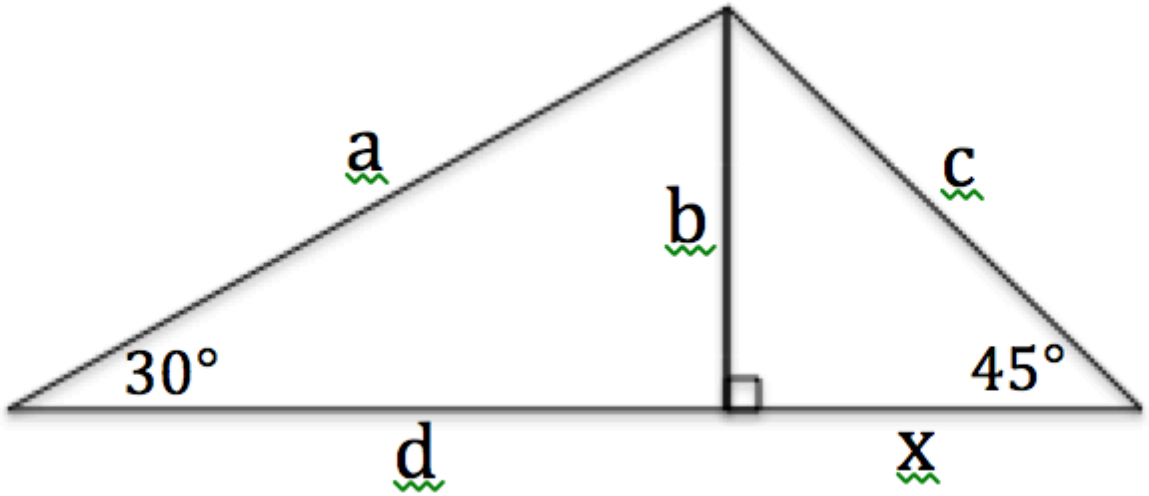
Clothesline Math

Exponential Decay or Oder of Ops?

$$y = 6\left(\frac{1}{2}\right)^x$$

$6\left(\frac{1}{2}\right)^0$	$6\left(\frac{1}{2}\right)^1$	$6\left(\frac{1}{2}\right)^2$

Clothesline Math
Special Right Triangles



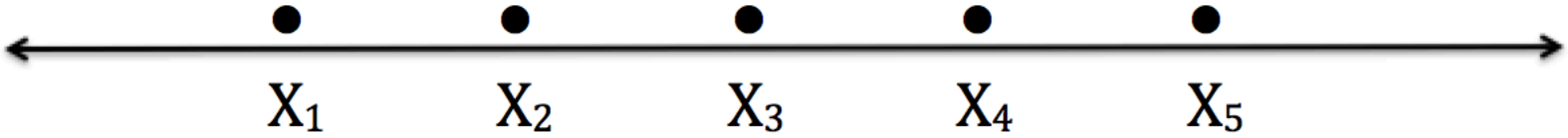
Clothesline Statistics

Logarithms

$\log_4 16$	$\log_2 \frac{1}{8}$	$\ln 1$

Clothesline Statistics

Measure of Center and Spread

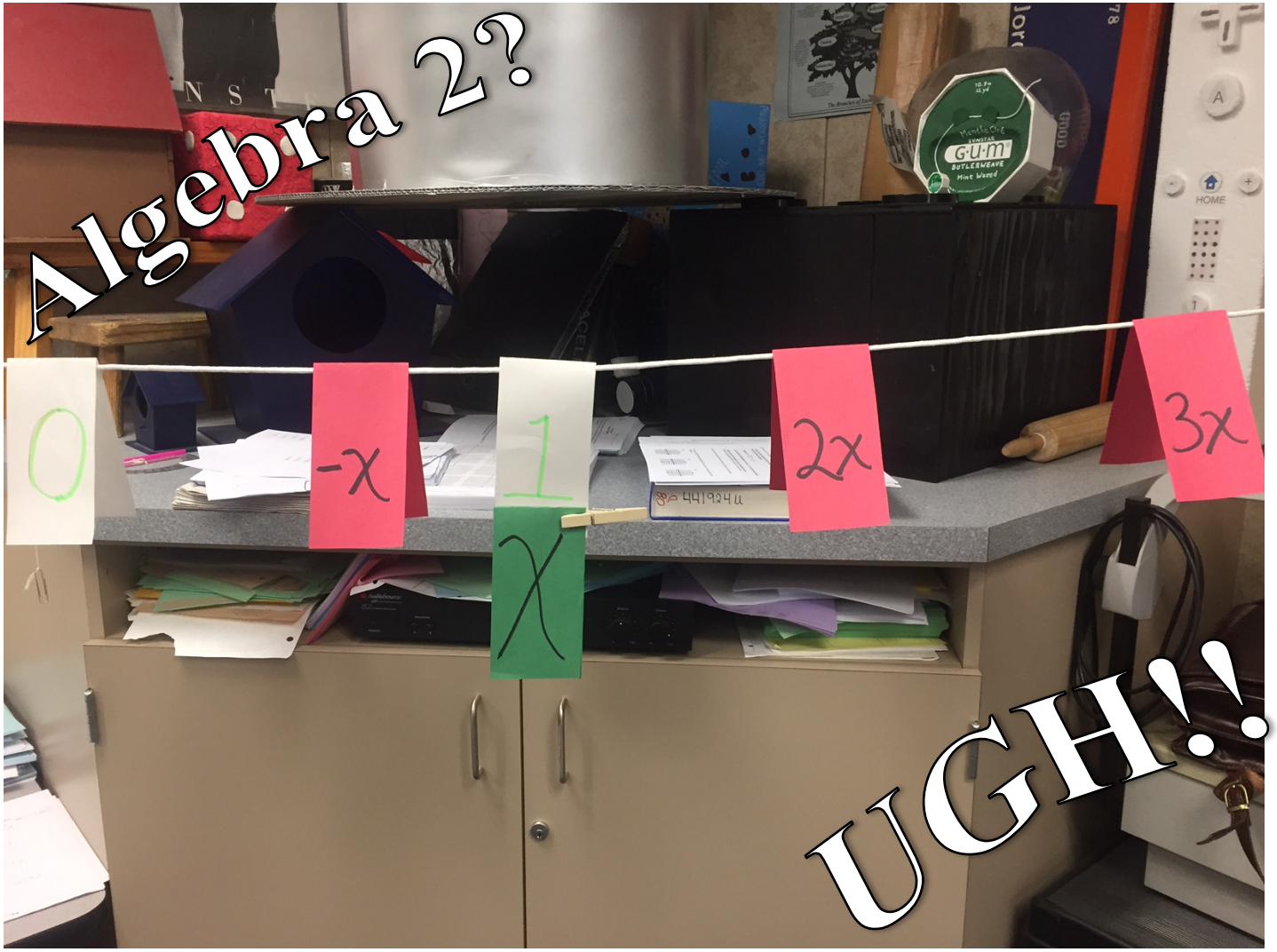


Larger *Range*

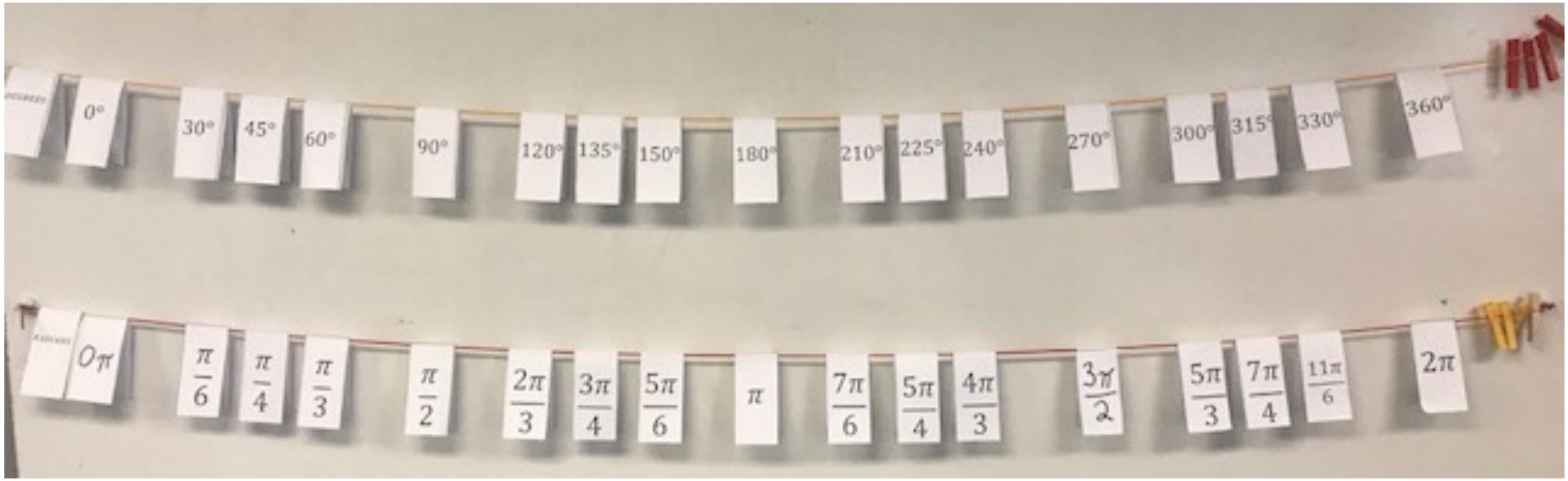
Smaller *Standard Deviation*

Smaller *Average*

Clothesline



Clothesline Math as Introduction



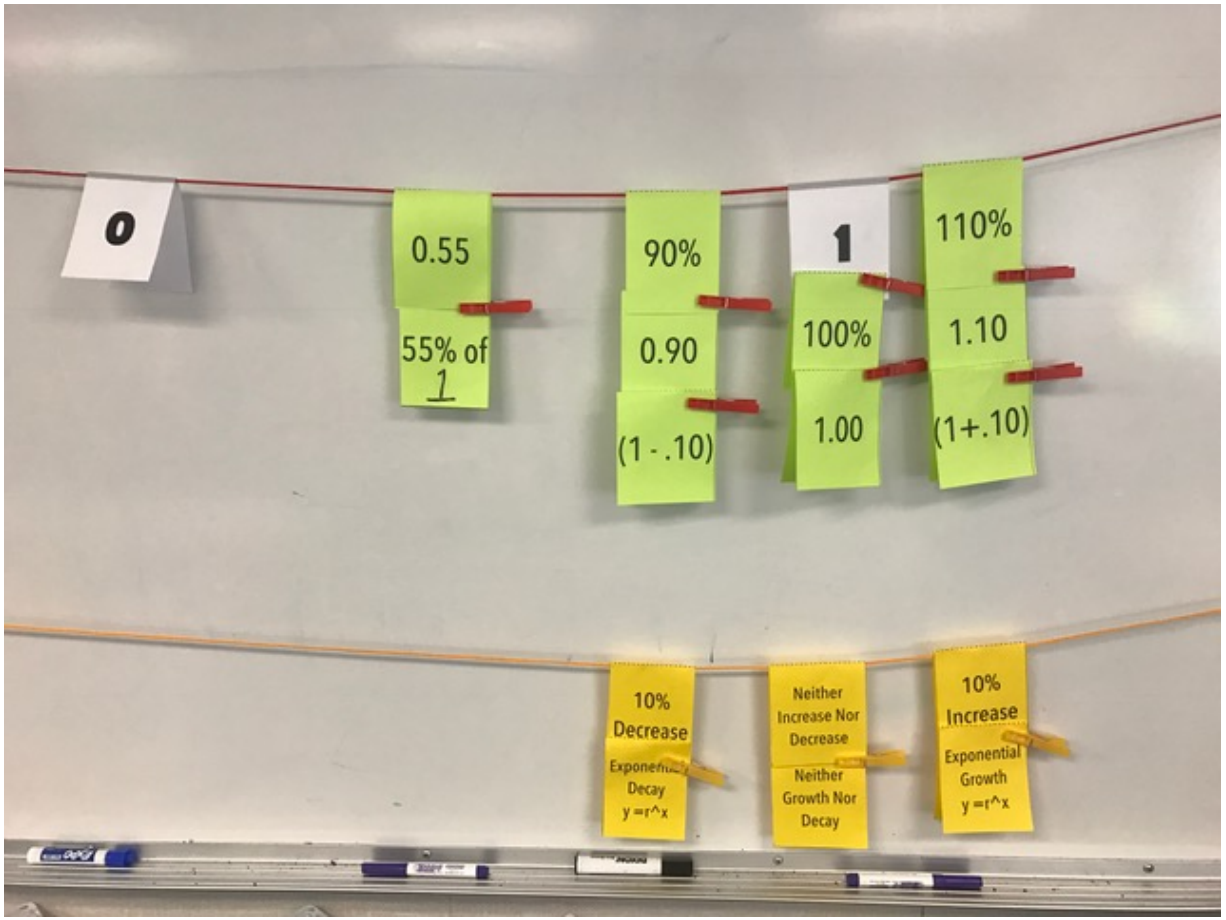
Clothesline Math as Review

$\sqrt[3]{8}$ $25^{\frac{1}{2}}$ -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 $-\sqrt{3}$ $8^{-\frac{1}{3}}$ $\sqrt{42}$

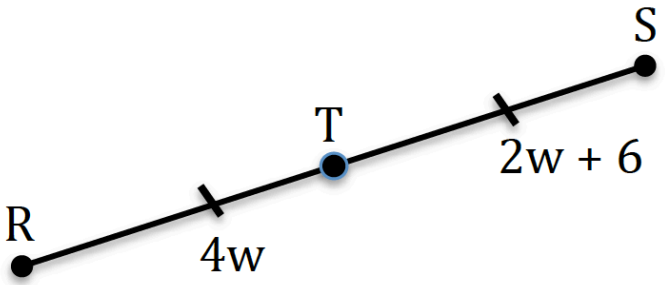
Clothesline Math

on conceptual warm-ups



Clothesline Math
on assignments

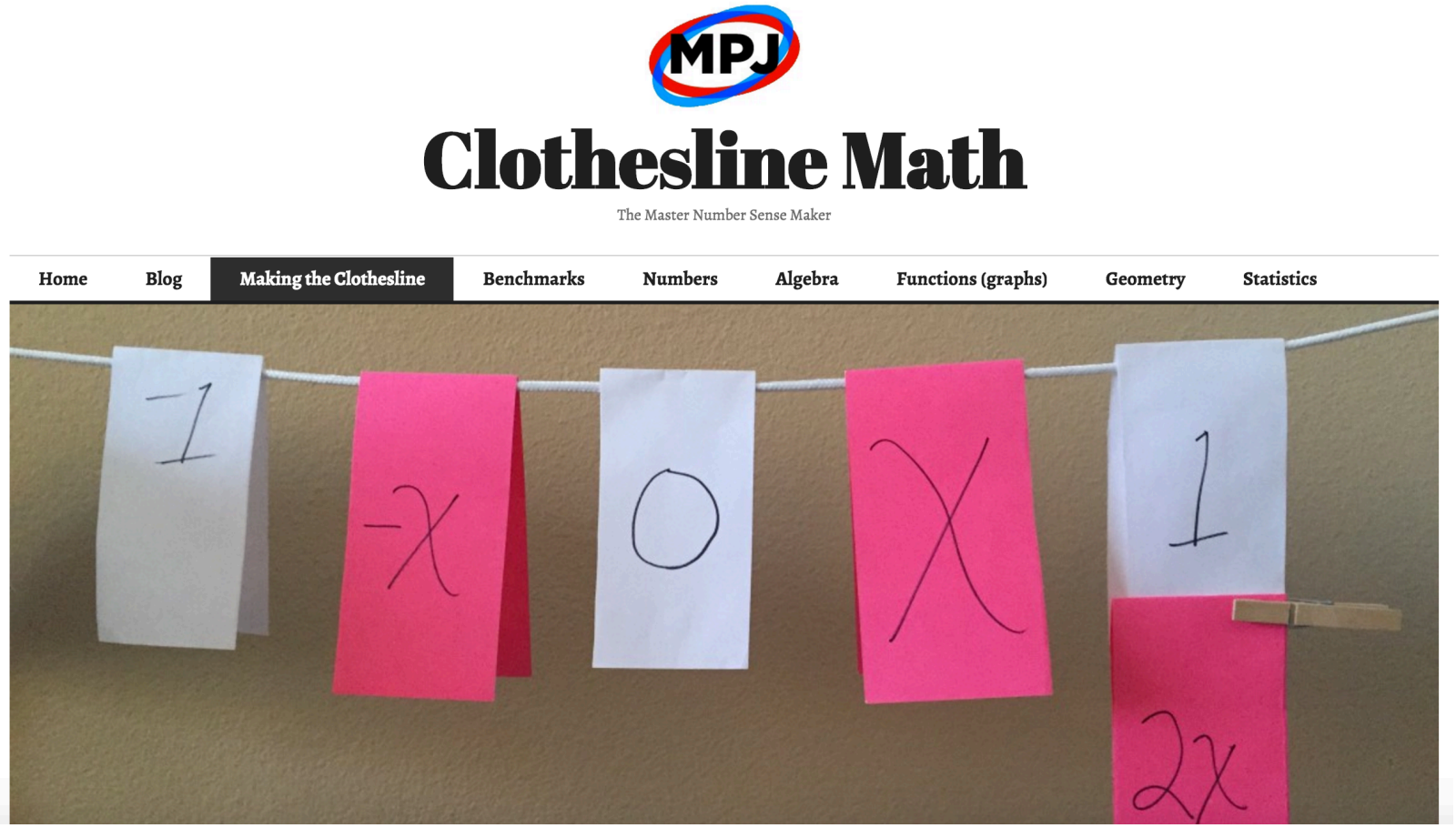
31. a. w, RT, TS, RS



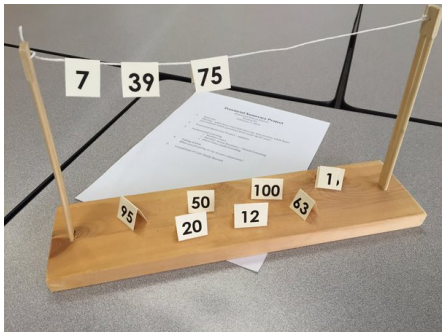
Clothesline Math on assessments

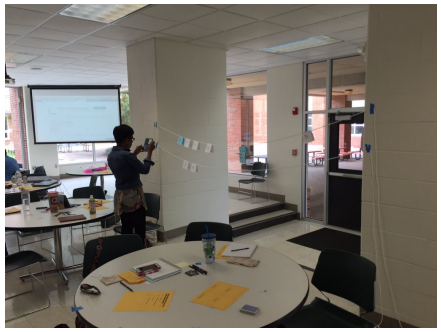
9) Given that $\frac{a}{b} = \frac{c}{d}$, a ≠c, and the position of a & b on the number line below, show a possible placement of c & d.

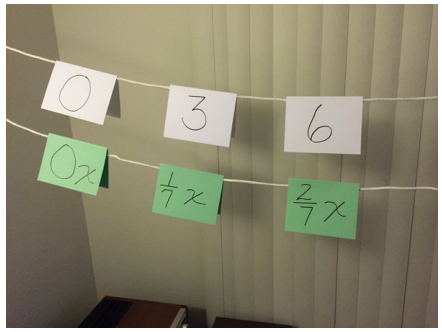
www.clotheslinemath.com

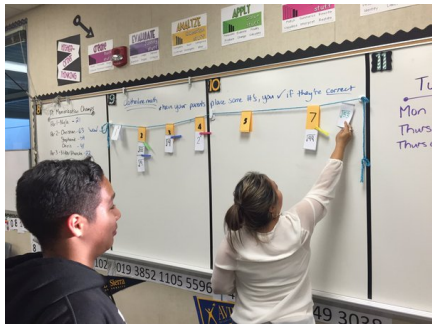


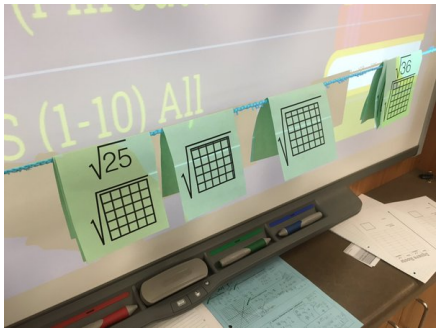
Clothesline Math Around the Nation

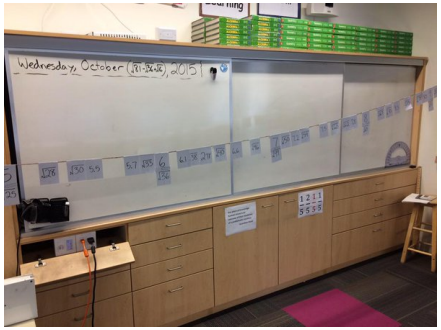


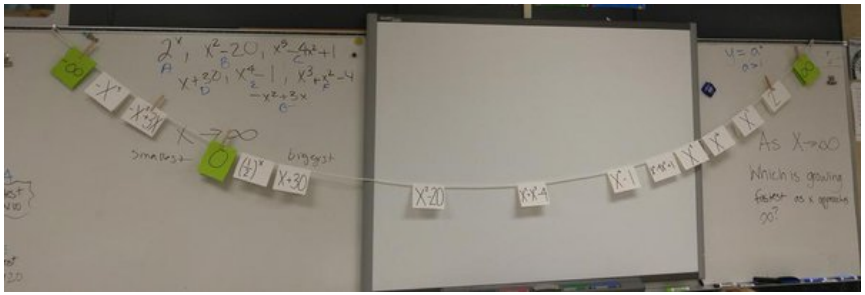


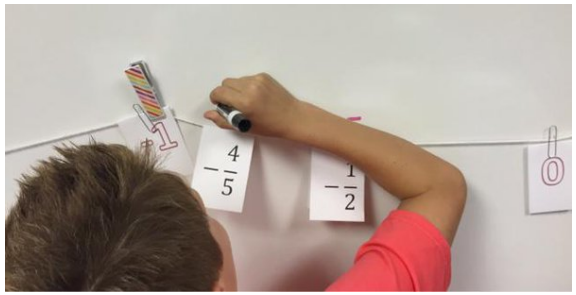




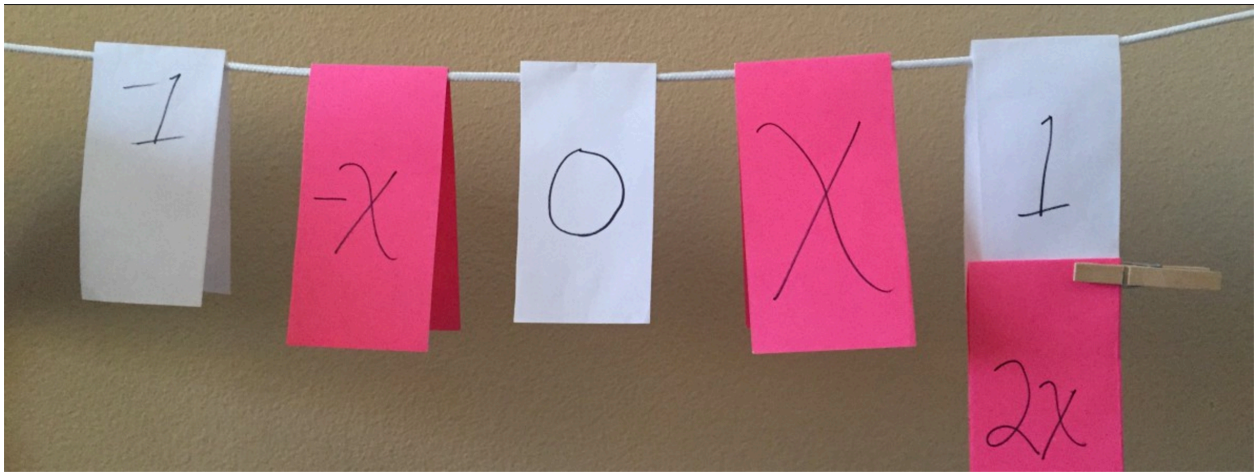








Why Clothesline Math?



The Intervention Paradigm

Case Study:

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

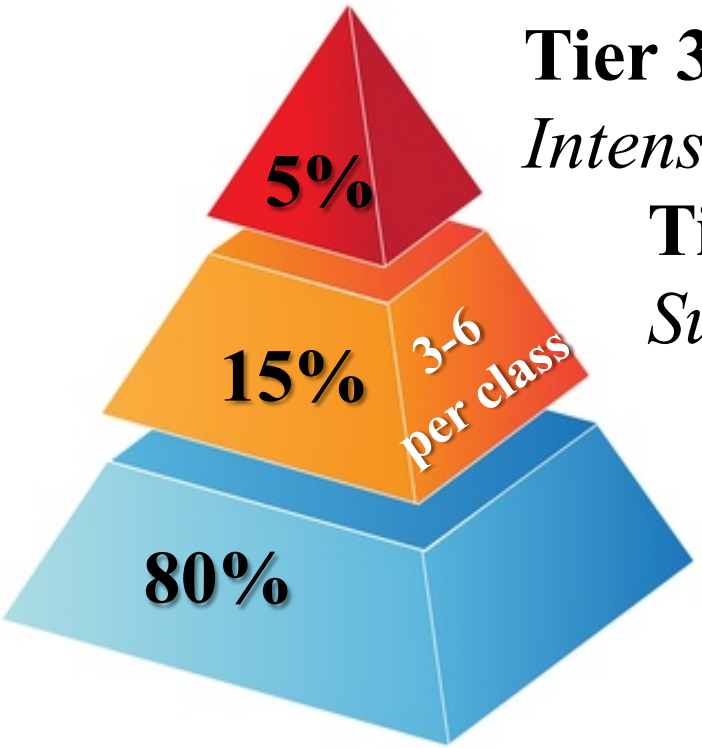
3-Day, 20-Min Intervention, then Post Test: 85% of those Passed

Acceleration = Extra Work Double Up?

What are your pre-req's?

MPJ

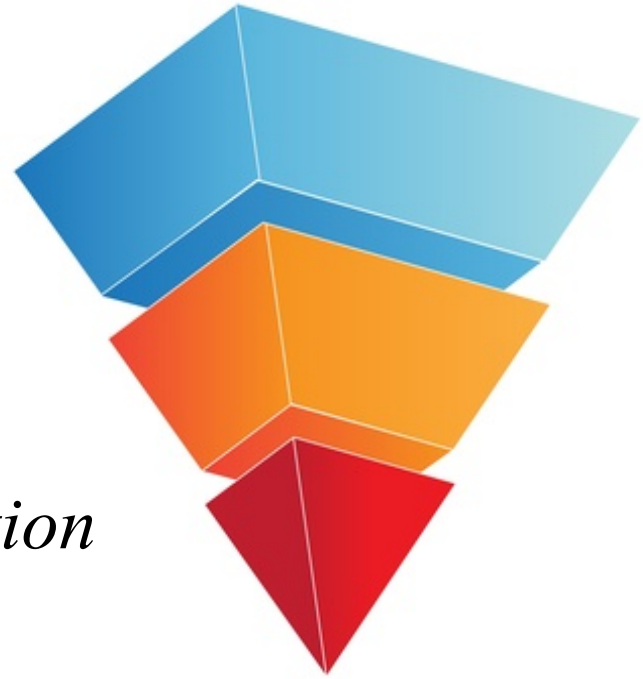
Boot Camp Numbers



Tier 3:
Intensive

Tier 2:
Supplemental

Tier 1:
Core Instruction



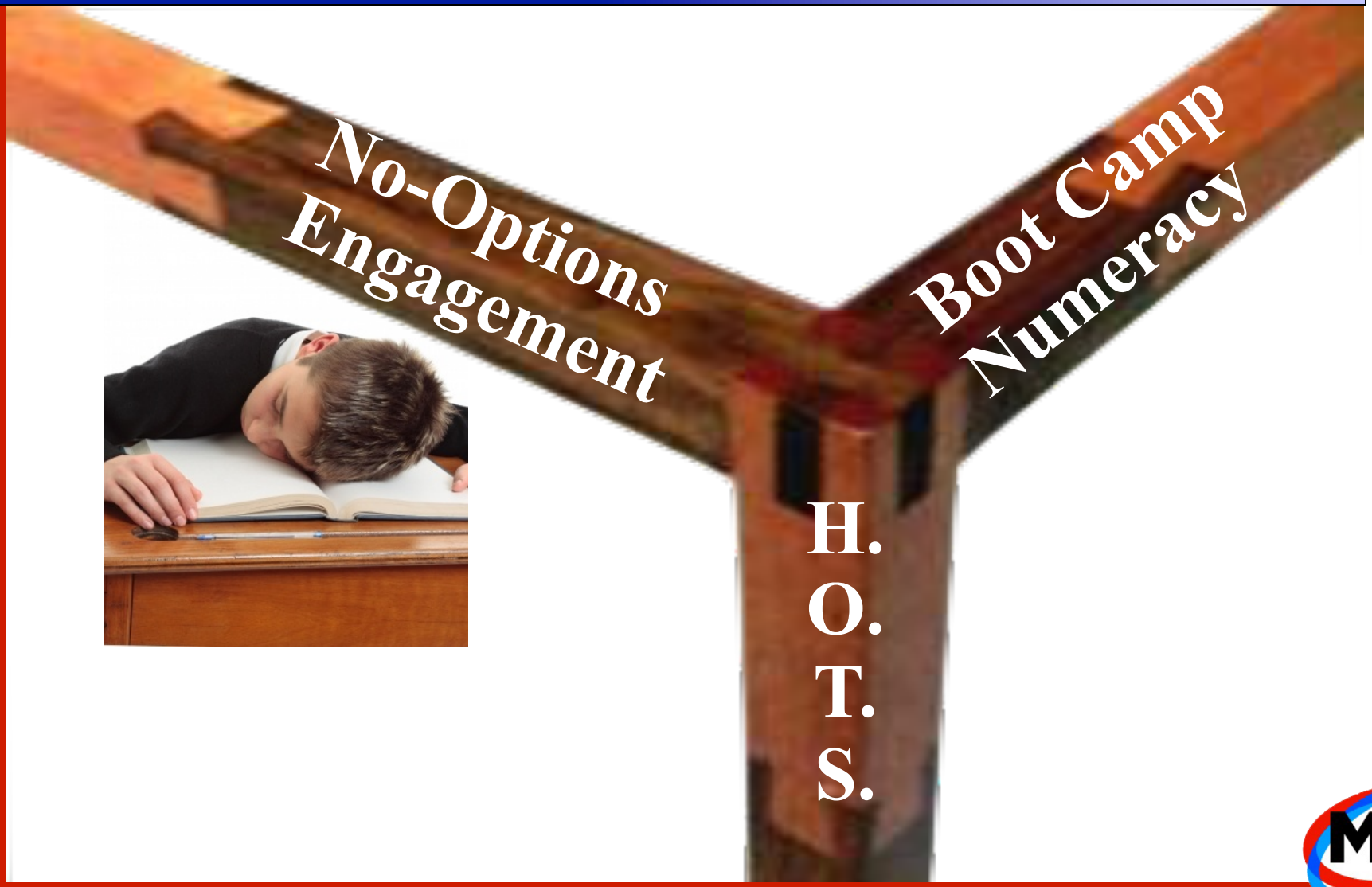
Boot Camp: Numeracy

Refresh
Warm-ups

Refine
Numeracy

Accelerate
Intervention
(pre-emptive)

Assessing, Addressing and Advancing "Those Kids"



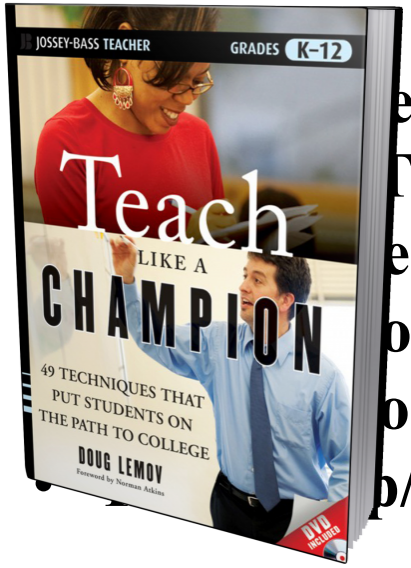
No-Options Engagement

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

Demand Their Best Effort

No-Options

(Make failure more painful than success)



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Engage

(No Quiet Deals)

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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

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Number Tricks

Number Tricks

Rediscovered

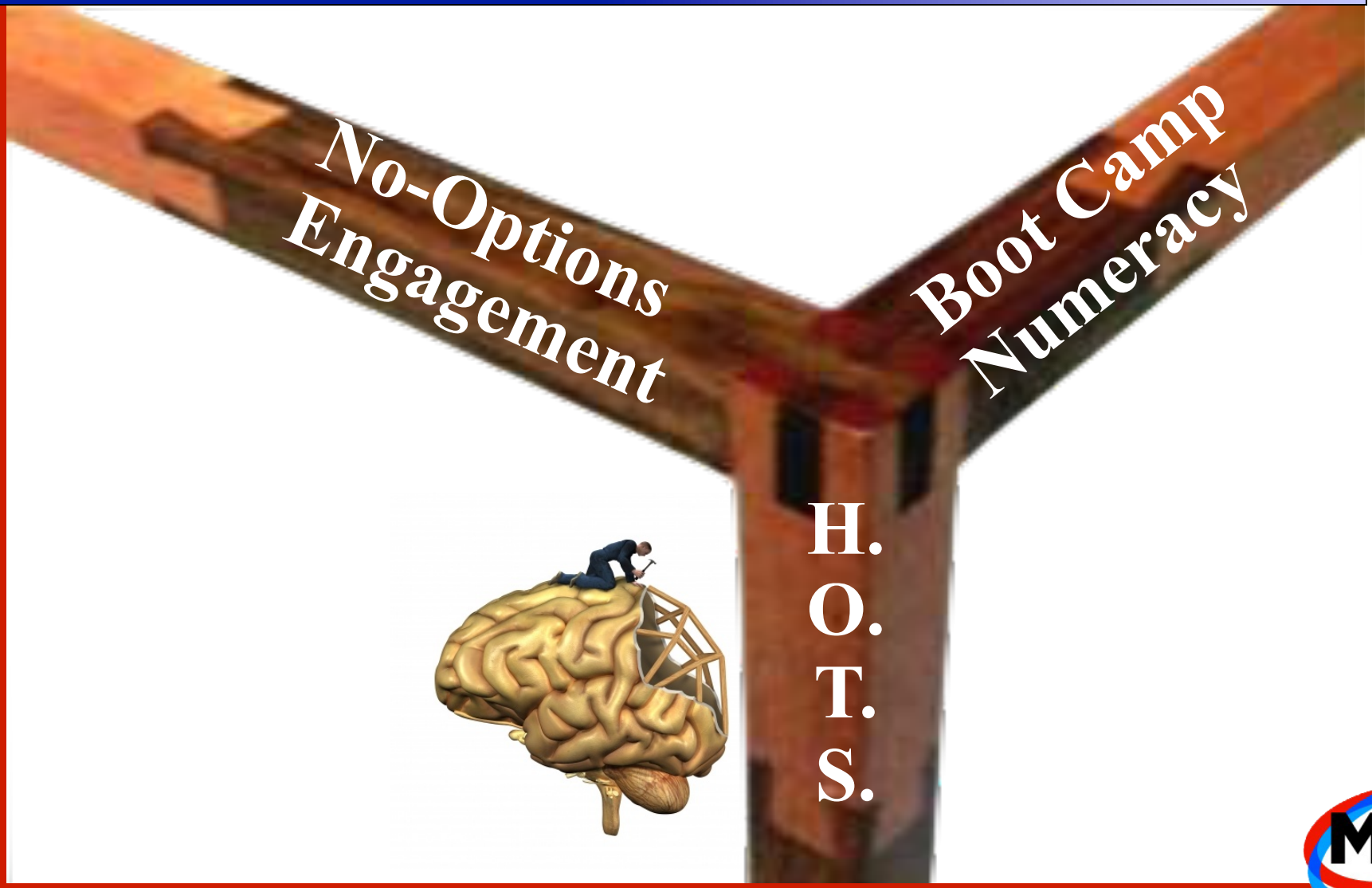
FACTORING

MPJ

numbertricks.net

Why Number Tricks?

Assessing, Addressing and Advancing "Those Kids"



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."

Defining Problem Solving

Exercise

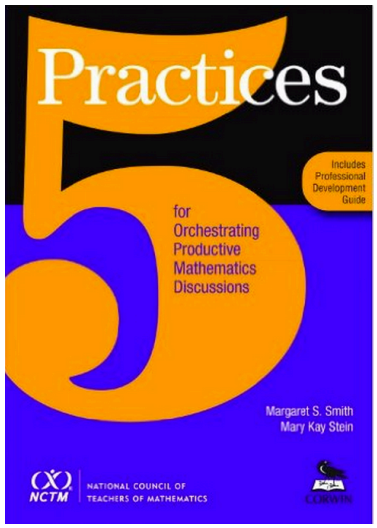
Problem

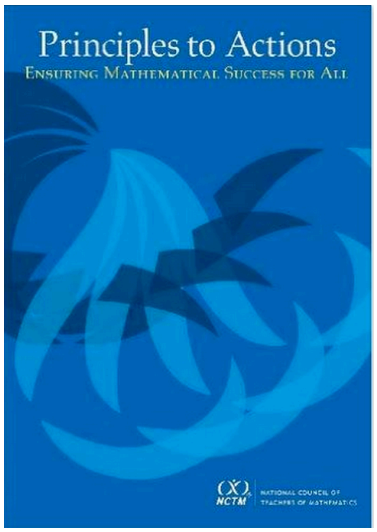
Don't Know How

Have the Ability

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

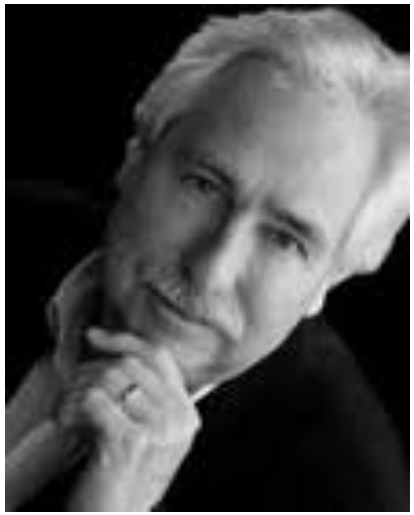
Tasks Are For Whom?

"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

- Understand
- Plan
- Execute
- Check
- Repeat until successful.

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

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Practices Posters




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




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COMMON CORE
STATE STANDARDS INITIATIVE

How many of the

8 SMP

do you remember?

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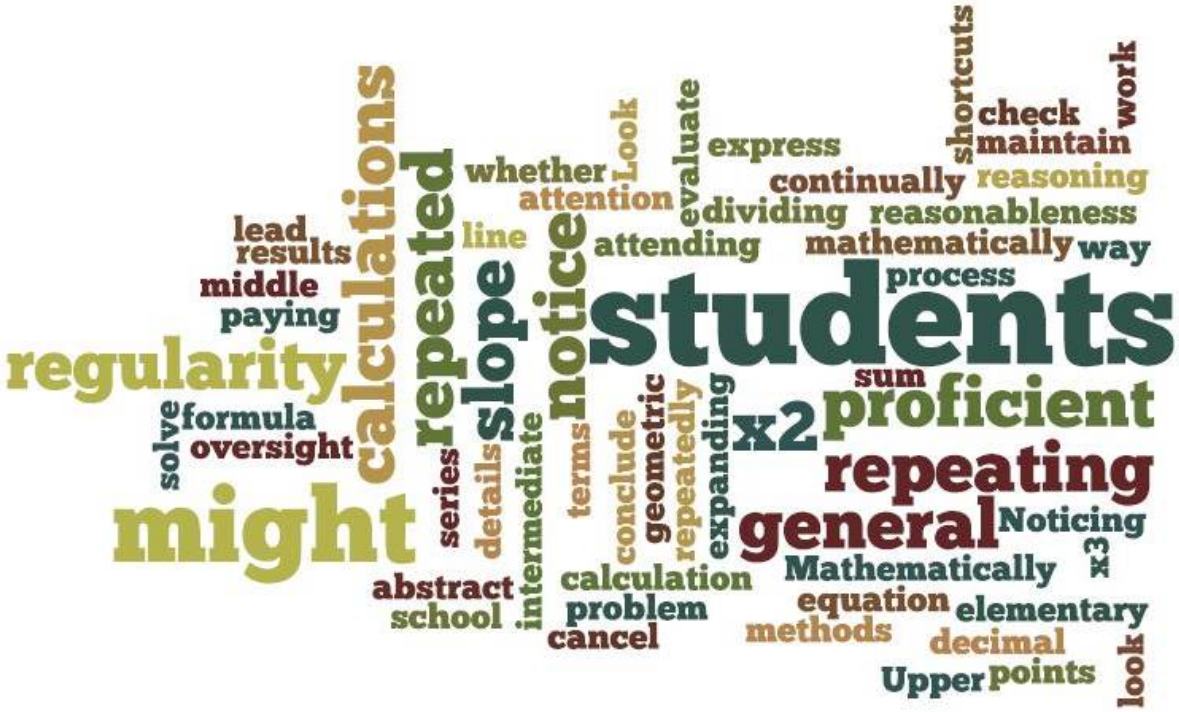
Wordle Practices

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



COMMON CORE
STATE STANDARDS INITIATIVE

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.

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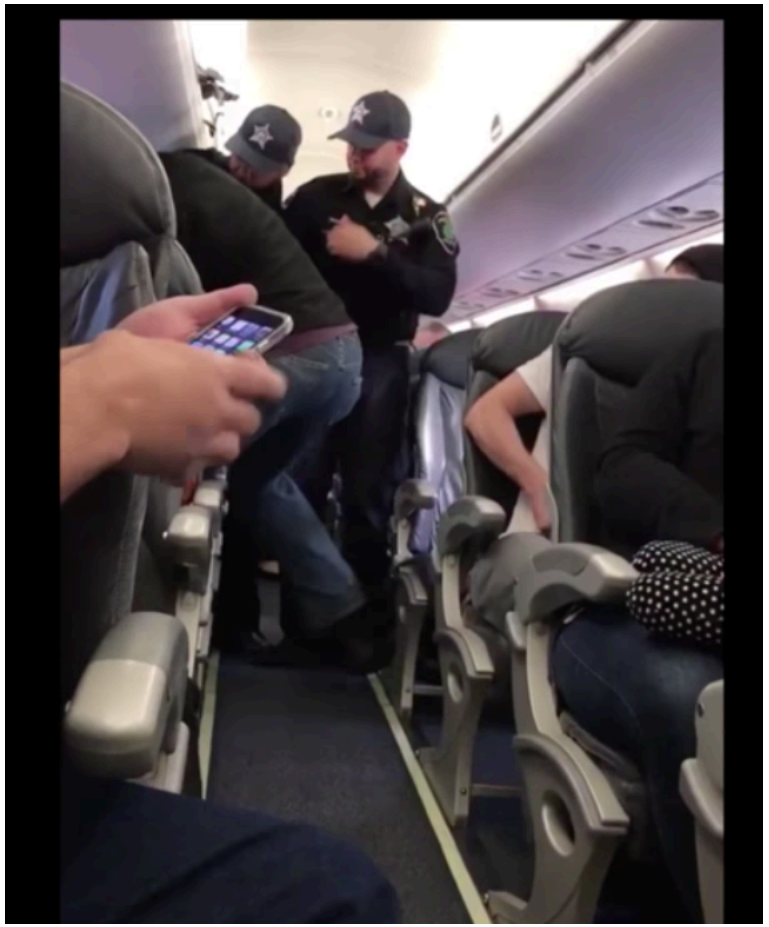
Bumping Airlines



The  -Digit Problem

$8 + 8 + 8 + 8 = 32$

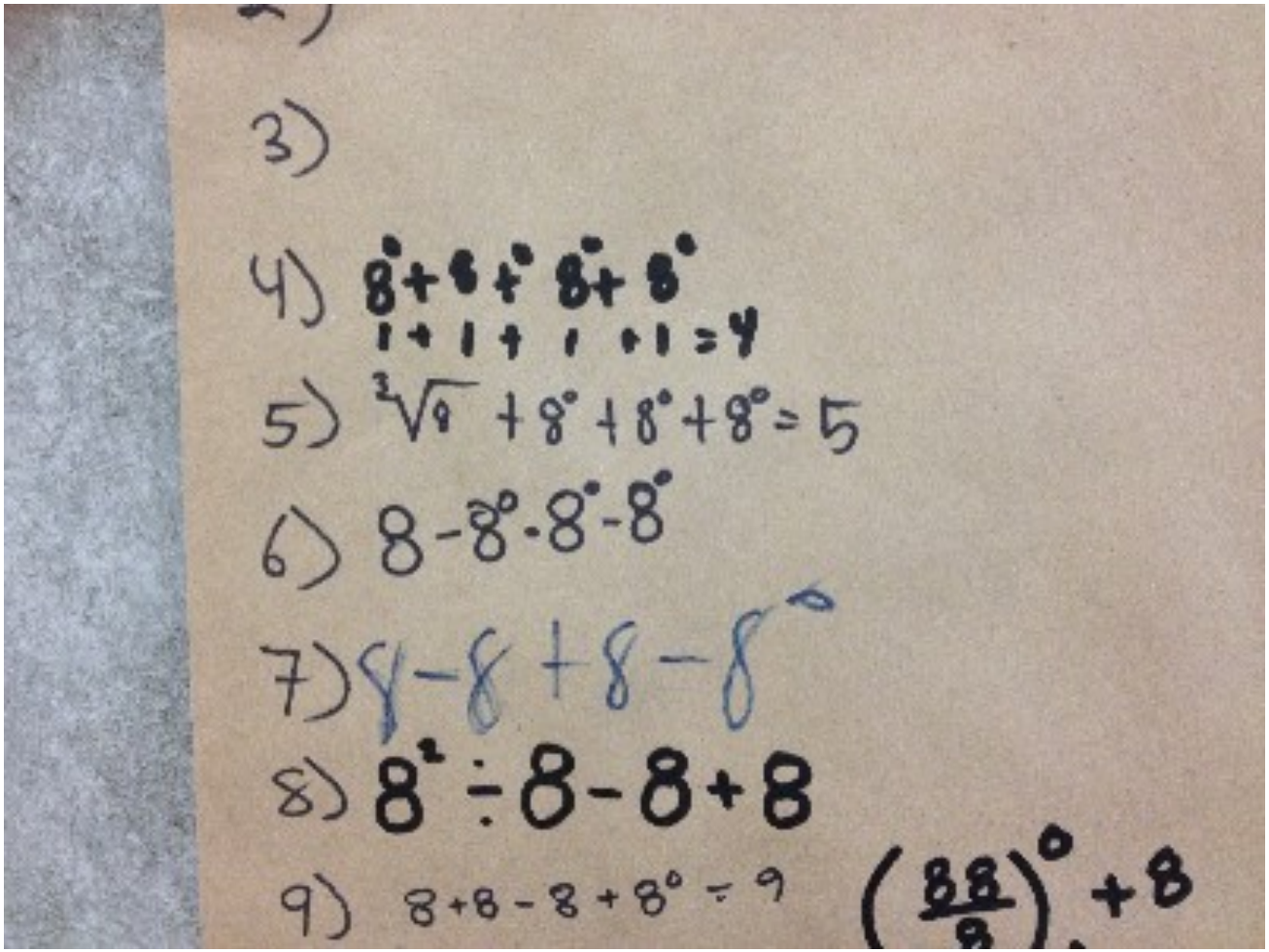
$8^2/8 + 88 = 96$

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

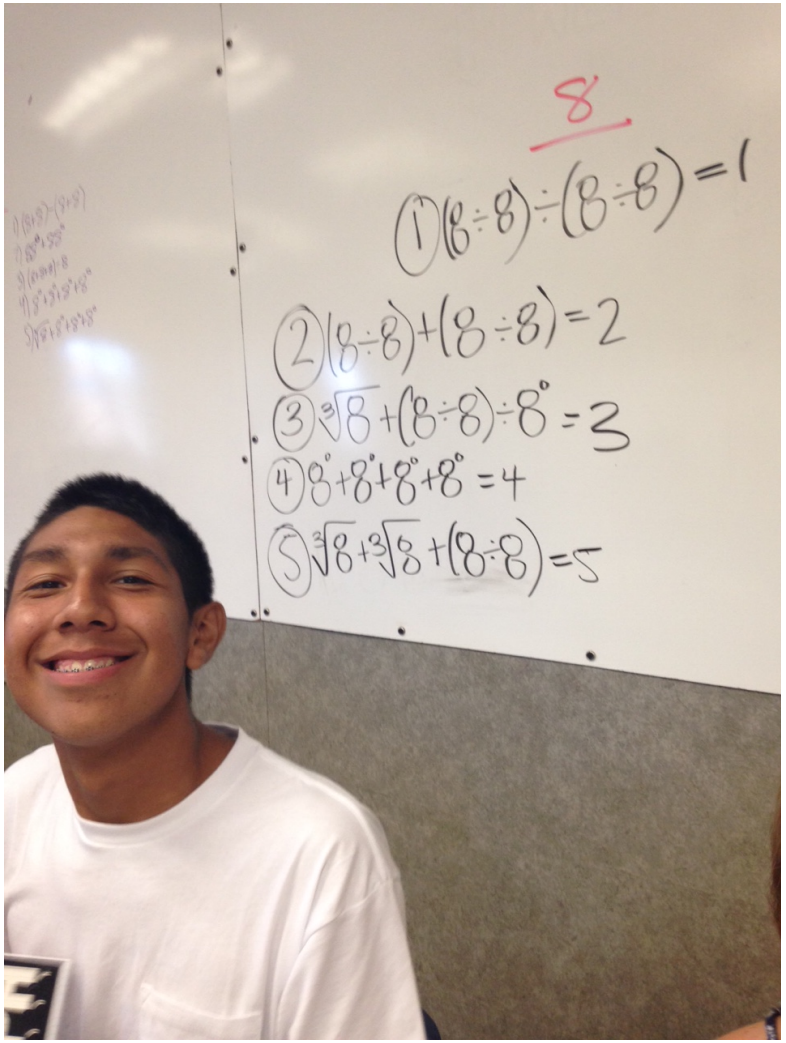
$88 \div 8 + 8$

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

The 4-Digit Problem

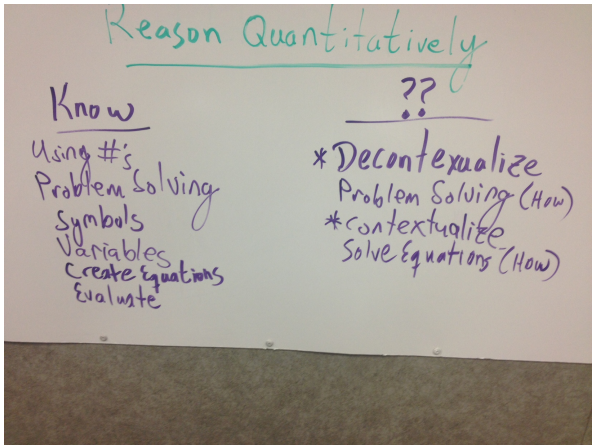


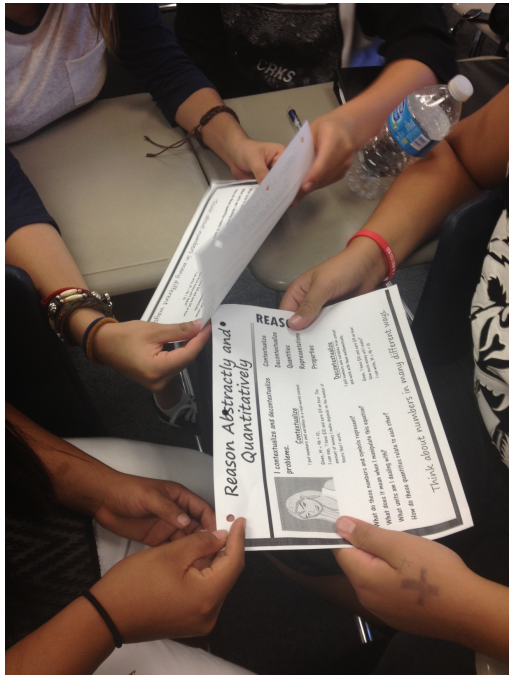
The 4-Digit Problem

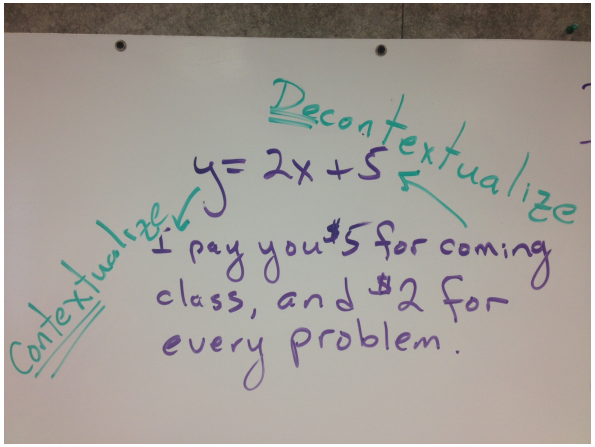


Explicit Instruction through Tasks in Algebra

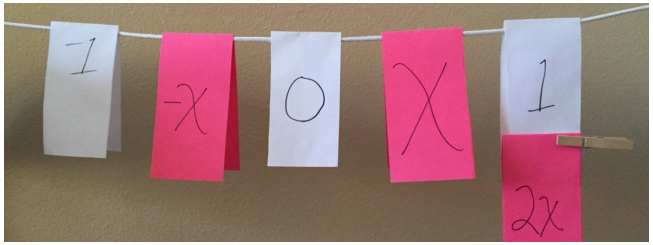
Target: We will use order of operations and quantitative reasoning to write expressions for a given value.

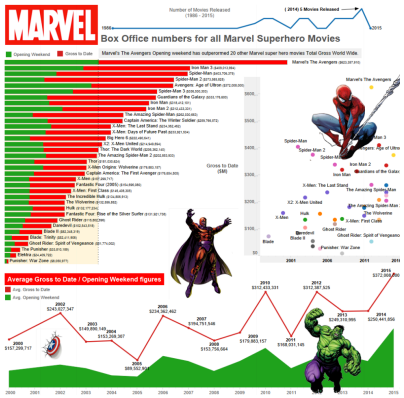




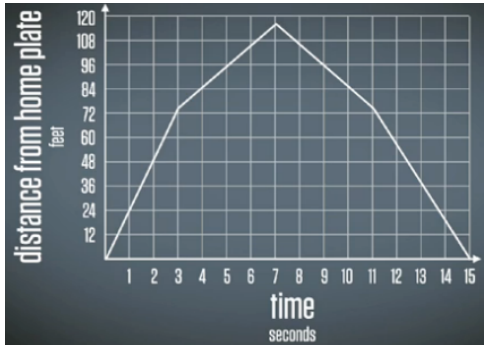


Other Boot Camp Resources





Refine



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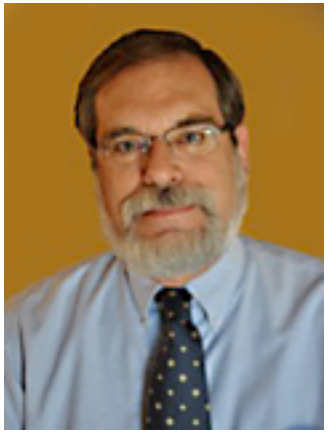
Unit Plan

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

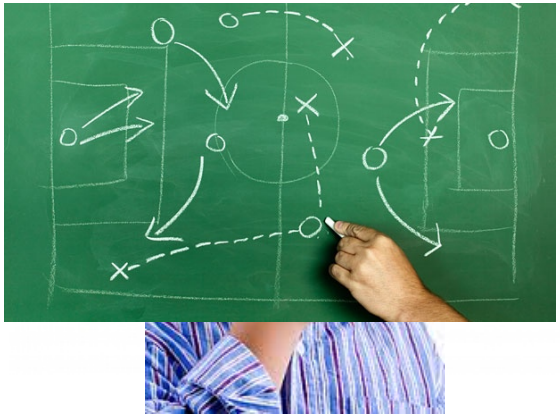
The Take-Aways

The Paradigm Shift

Boot Camp Numeracy

Engagement & H.O.T.S.

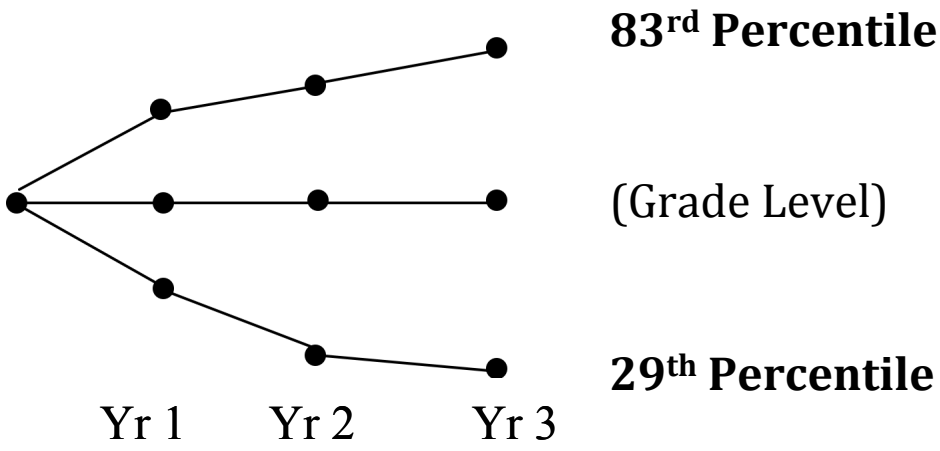
A Plan



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.

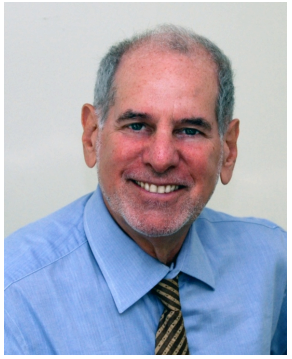
-- Dr. William Schmidt, University of Michigan

Teachers matter most.

-- Peg Smith, University of Pittsburgh

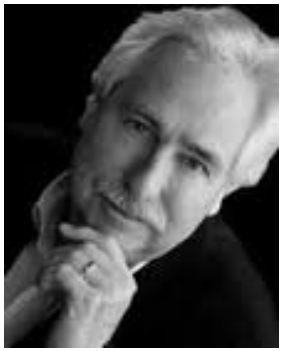
Teachers matter most.

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



Poverty matters … a lot.

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



Teachers matter most.

-- David Foster, Silicon Valley Math Initiative, CA

MPJ

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.

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