




GET to the CORE OF THE CORE

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#CMCS15
#CorewithShore




GET to the CORE OF THE CORE

Purpose of the Core


Perseverance through the Change

Progression towards the Goal




GET to the CORE OF THE CORE

Purpose



GET to the CORE OF THE CORE

$$6 + 4 + 4 + 8 = 21$$


GET to the CORE OF THE CORE

The Common Core has been around long before they called it the Comon Core.





GET to the CORE OF THE CORE

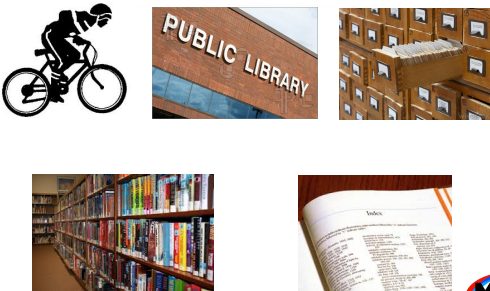




Teach students to THINK and COMMUNICATE their thinking.

These are the 21st Century Skills.



GET to the CORE OF THE CORE

GET to the CORE OF THE CORE




Think & Communicate
are the 21st Century Skills.

Obtain & Retain
were the 20th Century Skills.



The 6 Shifts
engage^{ny} We are redefining RIGOR.

Shift 1	Focus	Teachers significantly narrow and deepen the scope of how time and energy is spent in the math classroom. They do so in order to focus deeply on only the concepts that are prioritized in the standards.
Shift 2	Coherence	Principals and teachers carefully connect the learning within and across grades so that students can build new understanding onto foundations built in previous years.
Shift 3	Fluency	Students are expected to have speed and accuracy with simple calculations; teachers structure class time and/or homework time for students to memorize, through repetition, core functions.
Shift 4	Deep Understanding	Students deeply understand and can operate easily within a math concept before moving on. They learn more than the trick to get the answer right. They learn the math.
Shift 5	Application	Students are expected to use math and choose the appropriate concept for application even when they are not prompted to do so.
Shift 6	Dual Intensity	Students are practicing and understanding. There is more than a balance between these two things in the classroom – both are occurring with intensity.



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Think & Communicate

The 6 Shifts = The 21st Century Skills



The 4 C's
EdLeader21 We are redefining LEARNING and SCHOOL.



Critical Thinking
Communication
Collaboration
Creativity 60%



GET to the CORE OF THE CORE

Think & Communicate

The 4 C's = The 21st Century Skills



The 4 Claims
Smarter Balanced Assessment Consortium

We are redefining ASSESSMENT.

Concepts & Procedures
Critical Thinking
Communicate Reasoning
Construct Models

30%

MPJ

Old School vs New School

1 What is 6050.287 rounded to the nearest ten?

A 6050
B 6100
C 6050.29
D 6050.3

MPJ

Old School vs New School

43025

Five swimmers compete in the 50-meter race. The finish time for each swimmer is shown in the video.

Men's 50 Meter Freestyle

Explain how the results of the race would change if the race used a clock that rounded to the nearest tenth.

MPJ

Old School vs New School

33 $2\frac{1}{3} + 4\frac{1}{2} =$

A $6\frac{1}{6}$
B $6\frac{1}{5}$
C $6\frac{2}{5}$
D $6\frac{5}{6}$

MPJ

Old School vs New School

43328

Jared is testing how much weight a bag can hold. He plans to put juice bottles into three bags. He wants each bag to have a total weight within the given range.

- Drag juice bottles into each bag so that the weight is within the given range.
- Leave the bag empty if the given range is not possible using juice bottles.

Between 6 lb and 7 lb Between 10 lb and 11 lb Between 14 lb and 15 lb

MPJ

SBAC Claim: Concepts & Procedures

42906

A. Drag into the box exactly three unique expressions whose sum is less than 10.

B. Drag into the box exactly three unique expressions whose sum is between 10 and 20.

C. Drag into the box exactly three unique expressions whose sum is greater than 20.

5 $\sqrt{7}$
 $\sqrt{13}$
 $\frac{3^8}{3^5}$
 $20 - \sqrt{20}$
 $(4 \cdot 7)^{\frac{1}{2}}$
 $8^{\frac{1}{3}}$

A. Three unique expressions whose sum is less than 10

B. Three unique expressions whose sum is between 10 and 20

C. Three unique expressions whose sum is greater than 20

MPJ

SBAC Claim: Critical Thinking

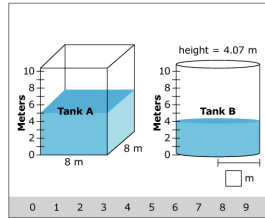
42968

Two water tanks are shown. Tank A is a rectangular prism and Tank B is a cylinder. The tanks are not drawn to scale.

Tank A is filled with water to the 10-meter mark.

Click Tank A to change the water level. The volume of water that leaves Tank A is transferred to Tank B, and the height of the water in Tank B is shown.

Drag one number into the box to show the approximate radius of the base of Tank B.



SBAC Claim: Communicate Reasoning

43052

Tony is buying a used car. He will choose between two cars. The table below shows information about each car.

Car	Cost	Miles Per Gallon (MPG)	Estimated Immediate Repairs
Car A	\$3200	18	\$700
Car B	\$4700	24	\$300

Tony wants to compare the total costs of buying and using these cars.

- Tony estimates he will drive at least 200 miles per month.
- The average cost of gasoline per gallon in his area is \$3.70.
- Tony plans on owning the car for 4 years.

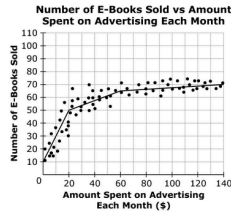
Calculate and explain which car will cost Tony the least to buy and use.



SBAC Claim: Models & Data

43028

Tyler earns \$3.00 for every e-book he sells on his website. (E-books are books that are available electronically.) He investigated the relationship between the amount spent on advertising each month and the number of e-books sold. He used this information to determine the lines of best fit shown in this graph.



What is the greatest amount Tyler should spend on advertising each month? Show your work or explain how you found your answer.



GET to the **CORE** OF THE CORE

Think & Communicate

The 4 Claims = The 21st Century Skills



The 8 Practices

The Practices are for the students.



Common Core Math is all about the Practices.

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.



The 8 Practices

Standards of Content

vs
Standards of Practice

COMMON CORE STATE STANDARDS INITIATIVE

Fluency

Deep Understanding

Multiplication as Grouping

Multi-Step Word Problems

Algebra 1 Grades 6-9

Explain Reasoning

Statistics

Transformations

Exponential Relations

Functions



The 8 Practices



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.
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GET to the **CORE** OF THE CORE

Think & Communicate

The 8 Practices =
The 21st Century Skills



GET to the **CORE** OF THE CORE

The 6 Shifts

+ The 4 C's

+ The 4 Claims

+ The 8 Practices

= The 21st Century Skills



GET to the **CORE** OF THE CORE

$$6 + 4 + 4 + 8 = 21$$

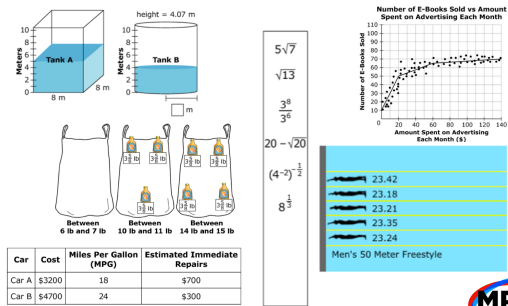


GET to the **CORE** OF THE CORE

Perseverance



What Does This Say About Your New Job Description?




The New Classroom

by Achieve the Core

“This change requires a different style of instruction than what many have come to call ‘sit and get.’

... teachers will have to encourage much more student work and student discourse and engage in far less teacher talk.”

**The Common Core is only a new expectation;
It does not dictate a change in instruction...
It only demands it.**




GET to the CORE OF THE CORE

Progression



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
Don't Have the Ability**

Crisis






Re-Orientation: This is THE Progression!



Notes-Oriented

30%




Task-Oriented

70%

Dual Targets

Content and Practice

Daily!



Task-Oriented Progression


What is a Task?

70%
Notes & Drill
30%

“A mathematical task is a problem or set of problems that focuses students’ attention on a particular mathematical idea and/or provides an opportunity to develop or use a particular mathematical habit of mind.”

— Adding it up (2001)

8 Practices




Task-Oriented Progression

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



“a problem that provides an opportunity to develop mathematical ideas and [thinking].”
-- Adding it up (2001)

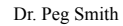



Task-Oriented Progression



Dr. Peg Smith

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




Tasks Are For Whom?


Accelerated Remedial Math Students
with Rich & Robust Tasks

ALL Kids!


Dave Foster



Dr. Uri Treisman



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



A black and white portrait of a man with white hair, resting his chin on his hand. He is looking directly at the camera with a slight smile. The background is dark and out of focus.

ALL Kids!



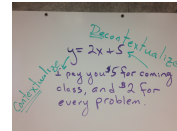
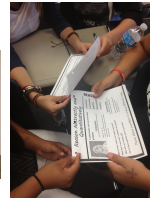
Explicit Instruction through Tasks in Algebra

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

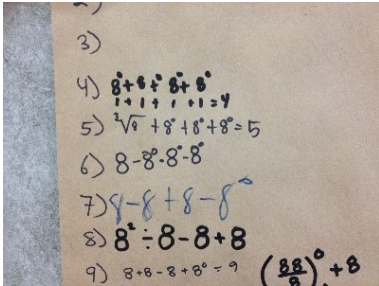
The collage consists of three images. The top image shows a group of students gathered around a table, looking at a worksheet. The bottom-left image shows a whiteboard with a list of 'Reason Quantitatively' tasks, including 'Know', 'What if...', 'Problem Solving', 'Symbolic', 'Connections', 'Problem Solving', and 'Connections'. The bottom-right image shows a whiteboard with a word problem: 'Dante has $2x + 5$ dollars. He pays you \$5 for coming class, and \$2 for every problem.'

Reason Quantitatively

<u>Know</u>	<u>??</u>
Using #:	* Decontextualize
Problem Solving	Problem Solving (New)
Symbols	* Contextualize
Variables	Solve Equations (New)
Create Equations	
Evaluate	



Explicit Instruction through Tasks in Algebra



A photograph of a piece of paper with handwritten algebraic tasks. The tasks are numbered 3) through 9). Task 3) is empty. Task 4) shows the expression $8^2 + 8^2 + 8^2 + 8^2$ with a circled 4 below it, and the result $4 \cdot 8^2 = 4 \cdot 64 = 256$ is written below. Task 5) shows $2^6 + 8^2 + 8^2 + 8^2 = 5$. Task 6) shows $8 \cdot 8 \cdot 8 \cdot 8$. Task 7) shows $8 - 8 + 8 - 8$. Task 8) shows $8^2 \div 8 - 8 + 8$. Task 9) shows $8 \cdot 8 - 8 + 8^0 = 9$ and $(\frac{88}{8})^0 + 8$. A red and blue logo with the letters 'MPJ' is in the bottom right corner.

3)

4) $8^2 + 8^2 + 8^2 + 8^2$
 $4 \cdot 8^2 = 4 \cdot 64 = 256$

5) $2^6 + 8^2 + 8^2 + 8^2 = 5$

6) $8 \cdot 8 \cdot 8 \cdot 8$

7) $8 - 8 + 8 - 8$

8) $8^2 \div 8 - 8 + 8$

9) $8 \cdot 8 - 8 + 8^0 = 9$ $(\frac{88}{8})^0 + 8$

MPJ



Explicit Instruction through Tasks in Algebra

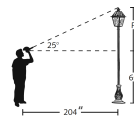
Target: We will **persevere** in solving problems with **trigonometry**.

Use Ratios
Substitute
Plot Points
Use Formulas
TesAssumptions
Write an Equations
Guess-n-Check
Measure

A diagram illustrating a trigonometry problem. A person is standing on the ground, looking up at the top of a lamppost. The horizontal distance between the person and the base of the lamppost is labeled as 204 feet. The height of the lamppost is labeled as 65 feet. A dashed line represents the line of sight from the person's eye level to the top of the lamppost, forming an angle of 25 degrees with the horizontal dashed line.

Common Sense
Fight the Gravity Storm
Use Tools
Reverse the Steps
Draw
Use Properties
Teamwork
Wrestle the Bear

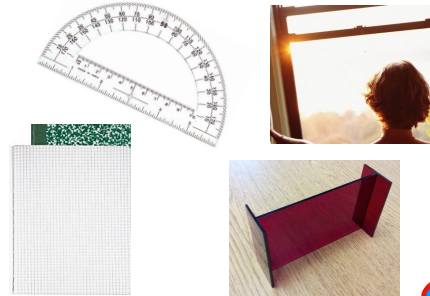
Use Ratios
Substitute
Plot Points
Use Formulas
Test Assumptions
Write an Equation
Guess-n-Check
Measure



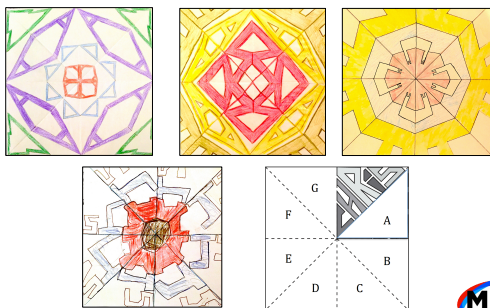
Creativity through Tasks



Creativity through Tasks



Creativity through Tasks



Classroom Models

Algebra 180 Blog



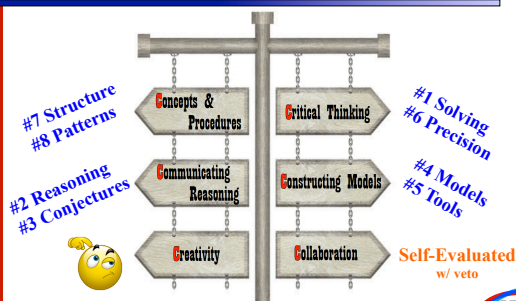
Geometry 180 Blog



www.mathprojects.com



The 6 C's: Value-Based Grading (my one original thought)



The Take-Aways

Purpose

The Common Core is all about teaching students to *think & communicate*,

Perseverance

so our *job description* has changed ...

Progression

to the *explicit teaching* of the Standards of Content & the Standards of Practice by being *task-oriented*.



Call to Action



ACT NOW

2-Week Rule



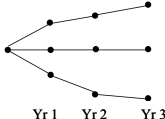

2-Week Rule



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




83rd Percentile

(Grade Level)

29th Percentile

Yr 1 Yr 2 Yr 3



-- Dr. William Schmidt, University of Michigan




The graph illustrates three potential paths for a student's percentile rank over a three-year period. The x-axis represents time, with markers for Year 1 (Yr 1), Year 2 (Yr 2), and Year 3 (Yr 3). The y-axis represents the percentile rank. Three lines originate from a single point on the left:


- The top line, labeled **83rd Percentile**, shows an upward trend, ending at the highest percentile rank in Year 3.
- The middle line, labeled **(Grade Level)**, is a horizontal line, indicating that the student's percentile rank remains constant over the three years.
- The bottom line, labeled **29th Percentile**, shows a downward trend, ending at the lowest percentile rank in Year 3.




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.
-- Uri Treisman, University of Texas, Austin



Teachers matter most.
-- David Foster, Silicon Valley Math Initiative, CA





-- Dr. William Schmidt, University of Michigan



— Peg Smith, University of Pittsburgh



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

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



-- David Foster, Silicon Valley Math Initiative, CA



Teach students to think & communicate ...

**...with the faith that they can learn it,
and that we can teach it to them,
because what we do matters... the most.**

www.mathprojects.com

Send your text message to this Phone Number: 37607

119090 (1 space) 0-3 0-3 0-3 (1 space) _____
poll code ↑ Other comments (words)

well-prepared &
knowledgeable engaging &
effective Matched title &
description

Example: 119090 323 Inspiring, good content

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