



Has a math problem ever made you feel like this

If you have 4 pencils and I have 7 apples how many pencils will fit on the roof? Purple, because aliens don't wear hats.

Geneva 304
 Common Core Math Implementation Update

The goal of Geneva 304 is to bring together
 Educators from all over
 to improve our Common Core Math
 and to let us learn from each other.

LearningAndTeaching@geneva304.org

Paty O'Hall- Assistant Superintendent
 G. Amy Sperry - Director
 Dennis Patonick - Elementary Math Facilitator

$$\begin{array}{r} 3,995 + 4,286 = \\ 3,995 \\ + 4,286 \\ \hline 8,281 \end{array}$$

$$3,996 + 4,286 + 4,286 + 3,286 = 15,854$$

Conceptual NOT Computational

Some background on the CCSS – Math
 Developing students' ability to reason mathematically.
 Common Core State Standards for Mathematics
 Developed and Content Frameworks
 Illustrative Mathematics

Key Themes
 Focus
 Coherence
 Rigor

The 8 Mathematical Practices



Big Ideas
 Deep Conceptual Understanding
 Creative, Adaptive Thinking
 Self-Directed, Personalized Learning
 Transferable Skills

Working Toward Our Vision...
 Collaborative Work
 Unpacking
 Revision/Review

Consultant supported Collaborative Work
 Development of District Based Resources
 Conceptual Development Year in 2013

2012-2013 School Year – Conceptual Development
 Self-Directed
 Continued Math Committee Work
 Teacher Collaboration

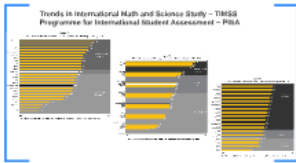
Development of Grade Level Resources
 Curriculum
 Problem Solving Skills and Strategies

The Need for a "Playbook"
 A Day to Day Tool
 Short Time Frame
 Flexible/Adaptable
 Builders and the Builders' Culture

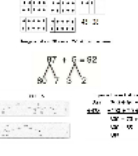
Eureka Math – A Tool to Support Conceptual Development



Learning and Teaching...
 A Commitment to a Conceptual Approach
 Ongoing Evaluation of Programming and Resources
 Ongoing Support for Students, Teachers, and Parents



Relevance of the Problem
 The CCSS – Math represent good instruction for skills
 Let's explore how...

Curricular Coverage of Assessed Content
 Average Coverage 11.5% – 52% of Assessed Content
 Average Coverage in Top Countries – 25% of Assessed Content

Geneva 304

Common Core Math Implementation Update

We are: Self-directed, lifelong learners;
Effective communicators;
Complex, creative, & adaptive thinkers;
And collaborative & productive citizens.




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Patty O'Neil~ Assistant Superintendent
Dr. Andy Barrett ~ Director
Donna Potaczek ~ Elementary Math Facilitator

Has a math problem ever made you feel like this

If you have 4 pencils and I have 7 apples how many pancakes will fit on the roof? Purple, because aliens don't wear hats.



$$\begin{array}{r} 3,995 + 4,260.9 \\ 3,995 \\ \hline 8,255.9 \\ 2,096 + 4(3,000) + 4,240(3,240) - 4 + 3,240 \end{array}$$



Conceptual NOT Computational

Geneva 304
Common Core Math Implementation Update

We're not just using numbers.
 We're using numbers to
 explore concepts, solve problems,
 and understand the world around us.

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Patty O'Neil - Assistant Superintendent
 Dr. Andy Smith - Director
 Donna Peterson - Learning Math Facilitator



Some background on the CCSS – Math
 Developing Mathematics – 2011
 2014-2015: 2012-2016
 National Governors' Association – 2007
 Common State Goals
 College and Career Readiness
 Memorably Deconstructed

Key Themes
 Focus
 Coherence
 Rigor



Big Ideas
 Deep Conceptual Understanding
 Creative, Analytic Thinking
 Self-Directed, Persistent Learning
 Transferable Skills

Working Toward Our Vision...

Conceive Web
 Unpacking
 Resource Review

Consultant Supported Covertive Work
 Development of District-Based Resources
 Conceptual Development Year in 2013

2012-2013 School Year – Conceptual Development

Math Facilitator
 Continued Math Committee Work
 Teacher Collaborations

Development of Grade Level Frameworks
 Collaboration
 Practice-Focused Skills and Strategies

The Need for a "Playbook"

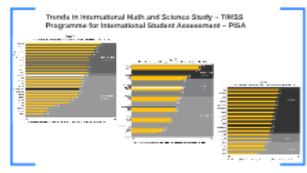
A Day in the "Seat"
 Short-Term Focus
 Practice-Focused
 Analyzers and the Problem-Solving Cycle

Eureka Math – A Tool to Support Conceptual Development

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6	LEVEL 7	LEVEL 8
Math								
Science								
ELA								
Art								
Music								
Physical Education								
Health								
Spanish								
French								
History								
Government								
Foreign Languages								
Technology								
Other								

Learning and Teaching...

A Commitment to a Conceptual Approach
 Ongoing Evaluation of Programing and Resources
 Ongoing Support for Students, Teachers, and Parents



Regularity of the Public
 The CCSS – Math requires good instruction for skills.
 Let's explore how...

Continual Coverage of Assessment Content

Average Coverage in US – 52% of Assessment Content
 Average Coverage in Top Countries – 58% of Assessment Content

Has a math problem ever made you feel like this



If you have 4 pencils and I have 7 apples how many pancakes will fit on the roof? Purple, because aliens don't wear hats.



Some background on the CCSS ~ Math

Illinois Learning Standards - 1997

ACHIEVE - 2006, 2008

National Governors Association - 2009



PARCC - 2010
(New Assessments in 14/15)

Common Standards

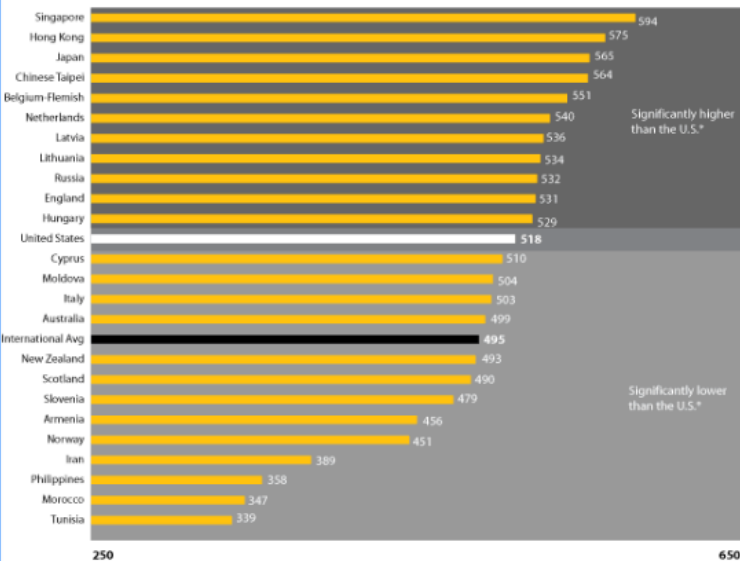
College and Career Readiness

Internationally 'Benchmarked'

Trends in International Math and Science Study ~ TIMSS Programme for International Student Assessment ~ PISA

Figure 10

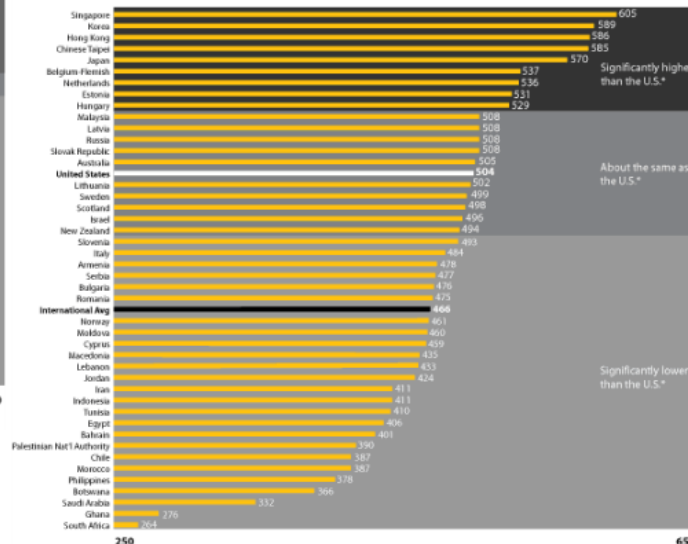
4th Grade Math: Overall Averages of Countries Participating in TIMSS, 2003



*The differences highlighted are statistically significant, or meaningful – they did not happen by chance.

Figure 12

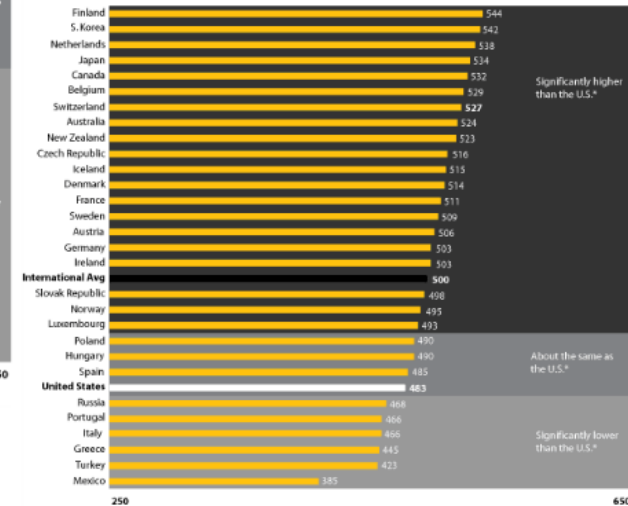
8th Grade Math: Overall Averages of Countries Participating in TIMSS, 2003



*The differences highlighted are statistically significant, or meaningful – they did not happen by chance.

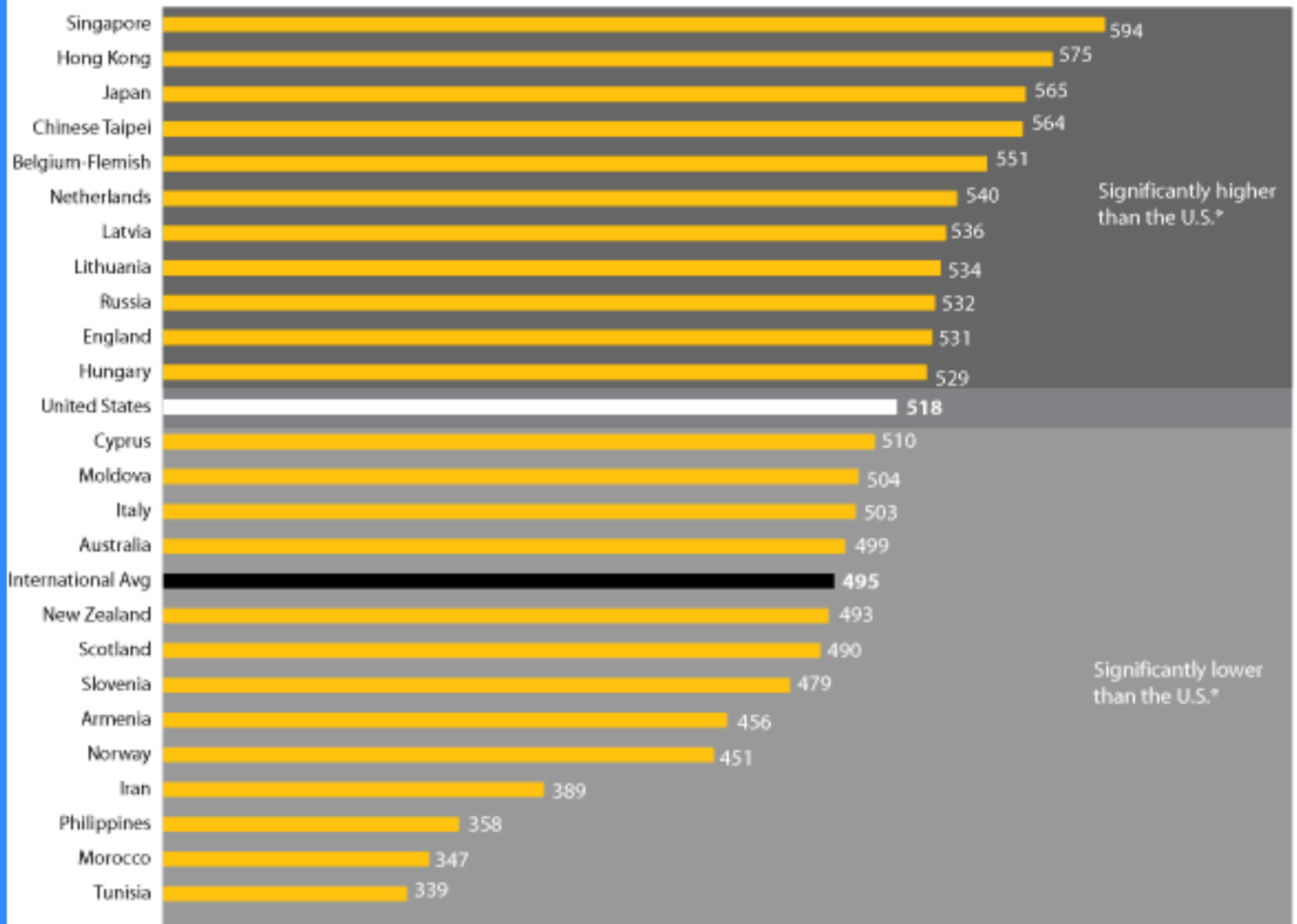
Figure 14

15-Year-Olds' Math: Overall Averages of Countries Participating in PISA, 2003



*The differences highlighted are statistically significant, or meaningful – they did not happen by chance.

Figure 10
4th Grade Math: Overall Averages of Countries Participating in TIMSS, 2003



250

650

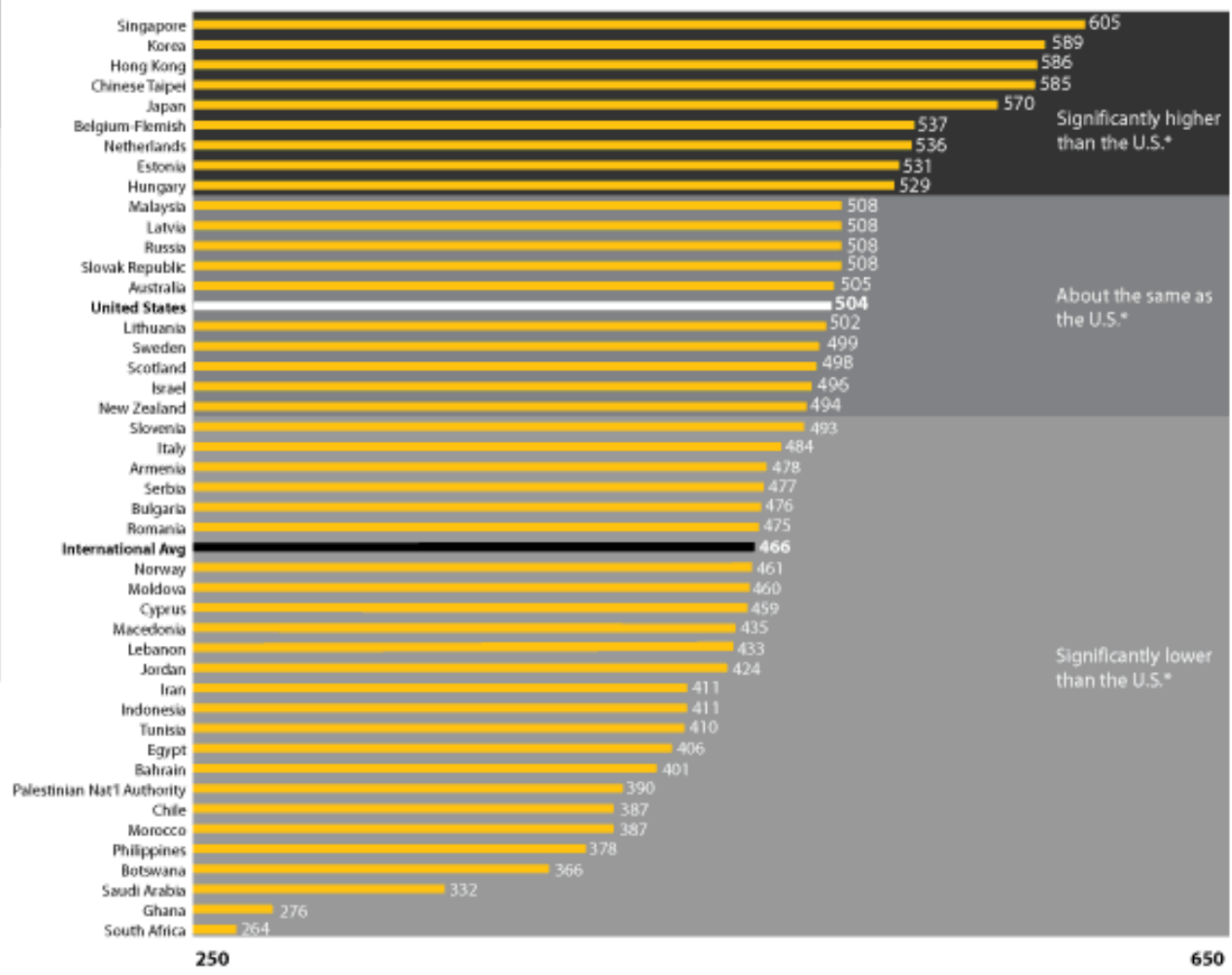
*The differences highlighted are statistically significant, or meaningful -- they did not happen by chance.

stantly higher
e U.S.*

stantly lower
e U.S.*

Figure 12

8th Grade Math: Overall Averages of Countries Participating in TIMSS, 2003



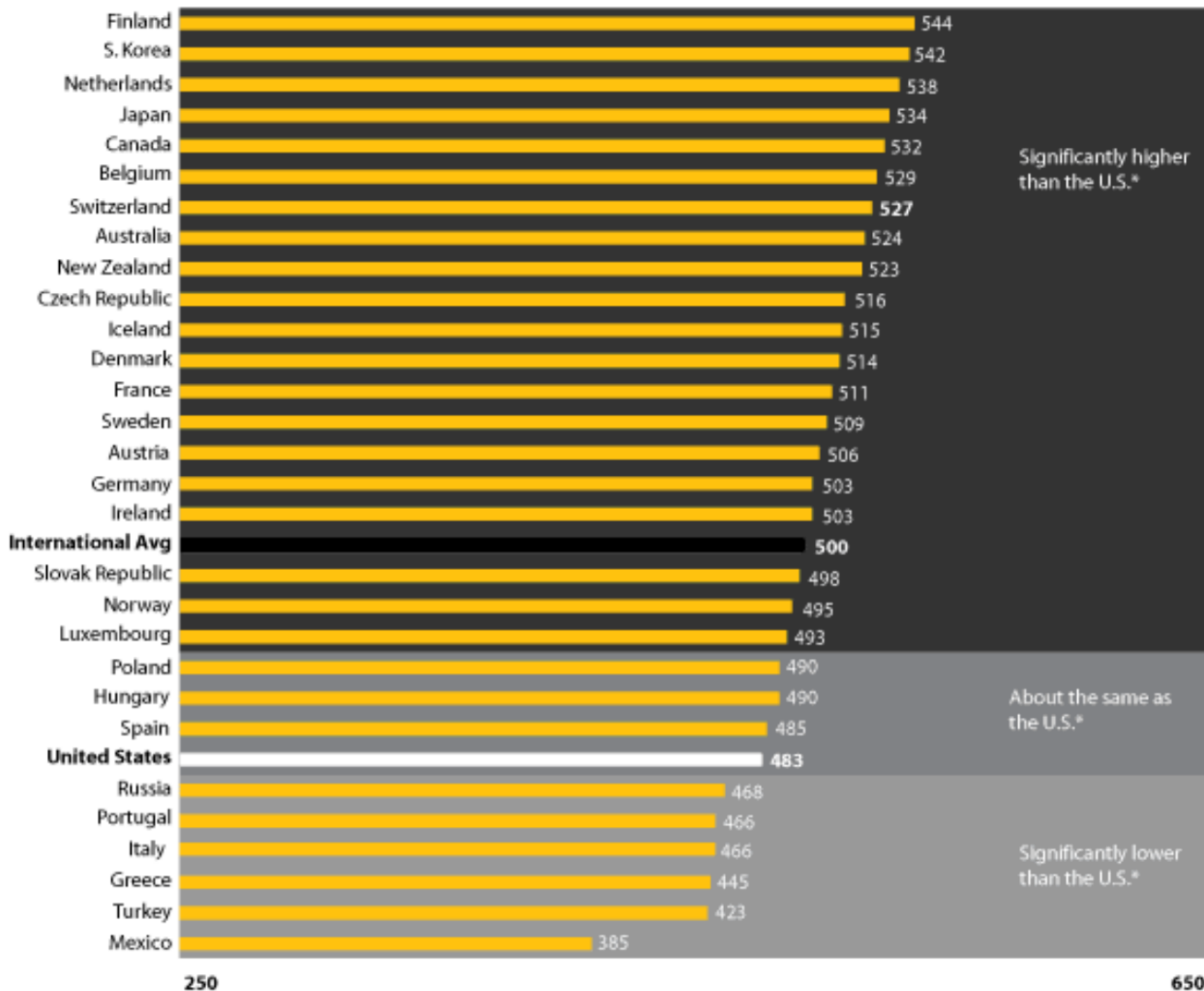
250

650

*The differences highlighted are statistically significant, or meaningful -- they did not happen by chance.

Finl
S. Ko
Netherla
Ja
Can
Belg
Switzerl
Aust
New Zeal
Czech Repu
Icel
Denm
Fra
Swe
Aus
Germ
Irel
International Avg
Slovak Repu
Nor
Luxemb
Pol
Hung
Sp
United Sta
Ru

Figure 14
15-Year-Olds' Math: Overall Averages of Countries Participating in PISA, 2003



250

650

*The differences highlighted are statistically significant, or meaningful-- they did not happen by chance.

Curricular Coverage of Assessed Content

Average Coverage In US ~
83% of Assessed Content

Average Coverage in Top Countries ~
50% of Assessed Content

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Common Core Math Implementation Update

We are: Self-directed, lifelong learners;
Effective communicators;
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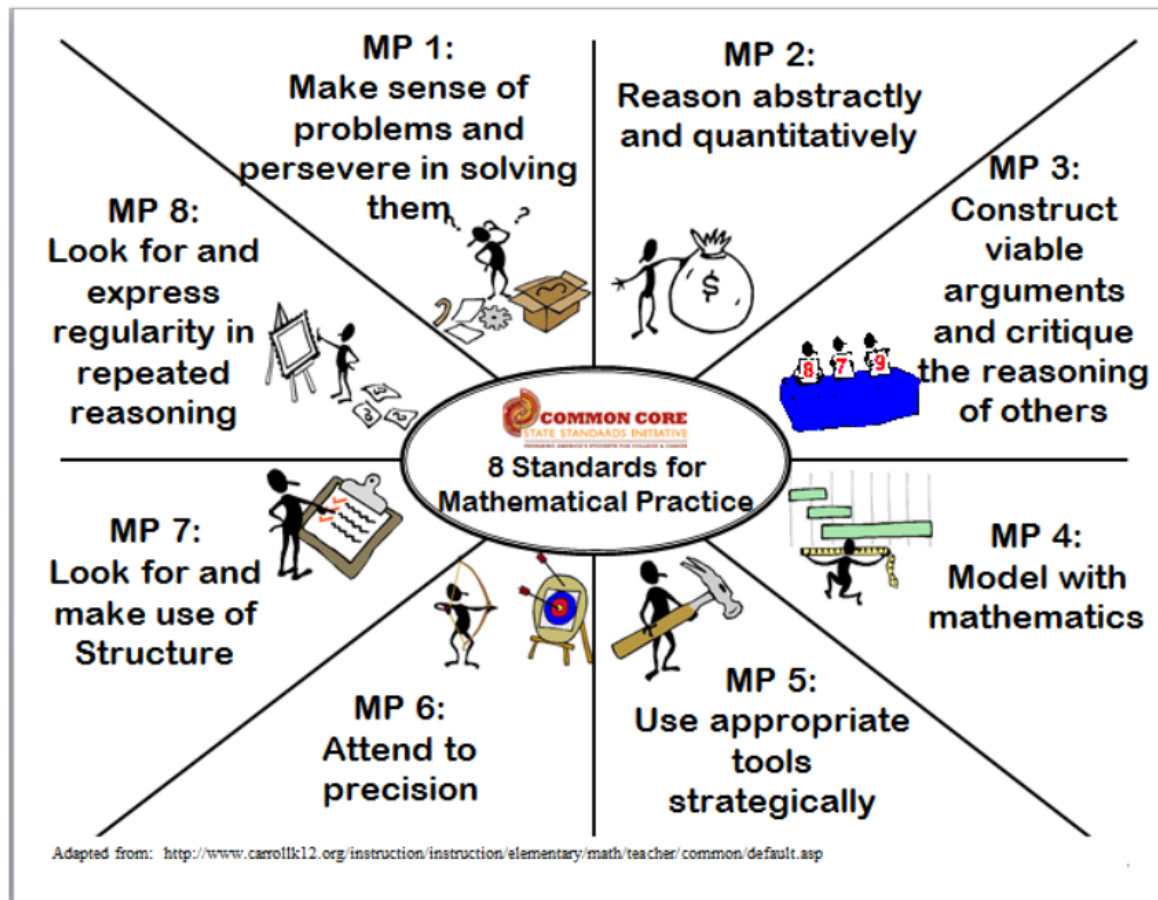
Key Themes

Focus

Coherence

Rigor

The 8 Mathematical Practices



Big Ideas

Deep Conceptual Understanding

Creative, Adaptive Thinking

Self-Directed, Perseverant Learning

In other words...

Geneva 304

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Regardless of the Politics

The CCSS ~ Math represent good instruction for kids

Let's explore how...

$$3,996 + 4,246 =$$

$$\begin{array}{r} 3,996 \\ + 4,246 \\ \hline 8,242 \end{array}$$

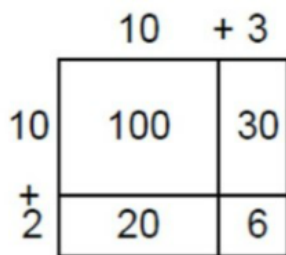
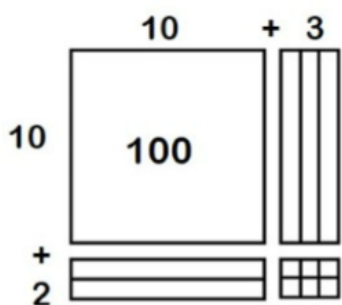
$$3,996 + 4(4,000) + 4,246(8,246) - 4 = 8,242$$

$$\begin{array}{r}
 39 \\
 \times 22 \\
 \hline
 78 \\
 + 78 \\
 \hline
 156
 \end{array}$$

$$\begin{array}{r}
 22 \\
 \times 14 \\
 \hline
 88 \\
 + 22 \\
 \hline
 110
 \end{array}$$

$$\begin{array}{r}
 64 \\
 \times 19 \\
 \hline
 576 \\
 + 64 \\
 \hline
 640
 \end{array}$$

Area model for multiplication
12 x 13



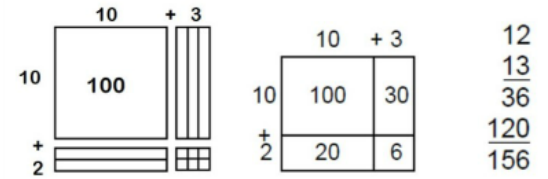
$$\begin{array}{r}
 12 \\
 \underline{13} \\
 36 \\
 \underline{120} \\
 156
 \end{array}$$

$$\begin{array}{r}
 3,990 \\
 + 4,246 \\
 \hline
 8,242
 \end{array}$$

$$000) + 4,246 (8,246) - 4 = 8,242$$



Area model for multiplication
12 x 13



Conceptual NOT Computational

Working Toward Our Vision...

Committee Work

'Unpacking'

Resource Review



Consultant Supported Committee Work

Development of District-Based Resources

Conceptual Development Year in 12/13

2012-2013 School Year ~ Conceptual Development

Math Facilitator

Development of Grade Level Resources

Continued Math Committee Work

'Gamification'

Teacher Collaboration

Practice New Skills and Strategies

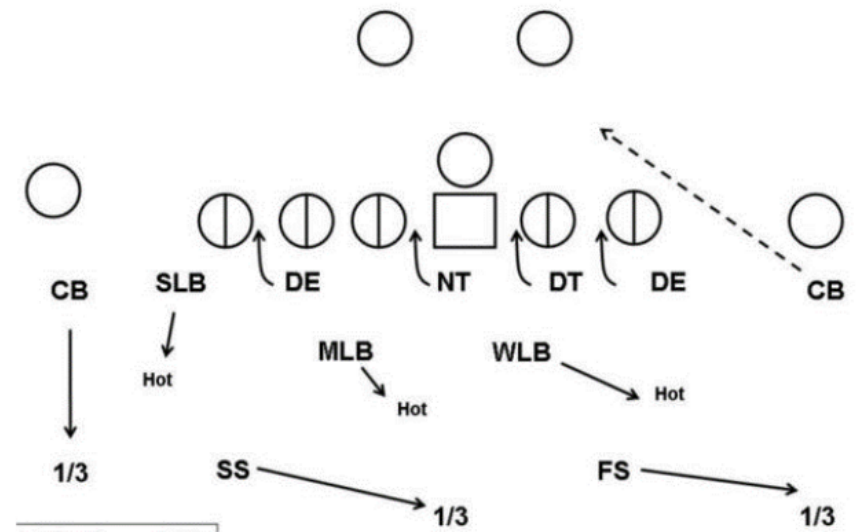
The Need for a "Playbook"

A Day-to-Day Tool

Short Time-Frame

Financial Implications

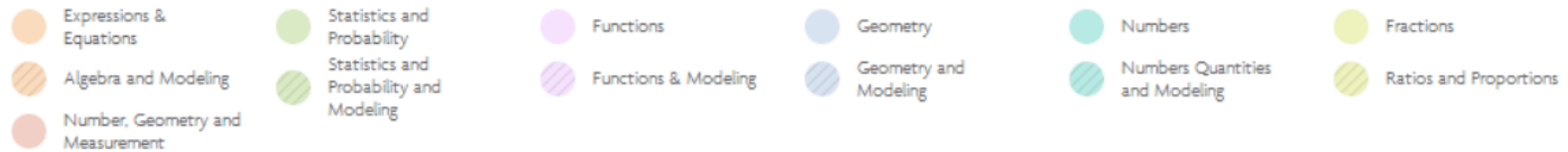
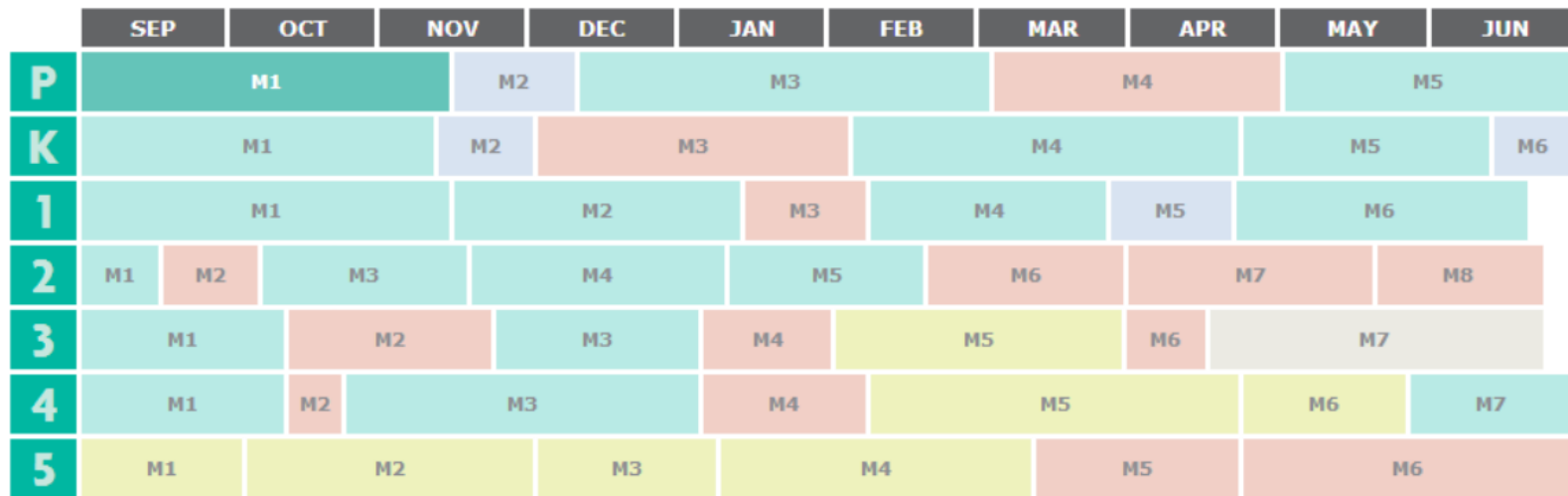
Publishers and 'The Publishers' Criteria'



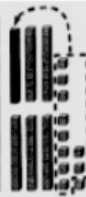
Eureka Math ~ A Tool to Support Conceptual Development

A STORY OF UNITS

A STORY OF RATIOS AND FUNCTIONS



tens	ones
1	
2	3
3	8
<hr/>	
6	1



tens	ones
2	1
2	7
<hr/>	


tens	ones
1	2
2	4
<hr/>	

tens	ones
3	7
4	5
<hr/>	

Add all the hundreds.
Regroup if necessary.

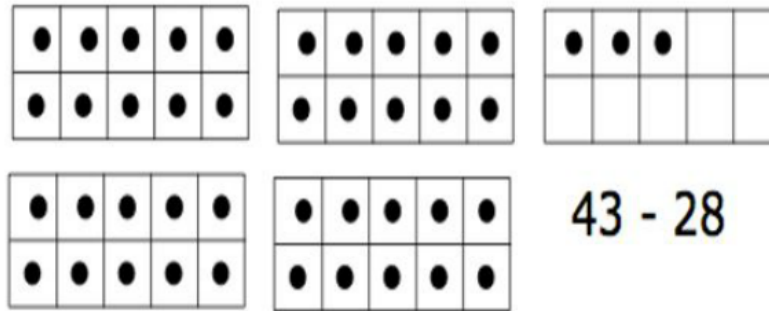
$$\begin{array}{r}
 111 \\
 6,713 \\
 + 5,389 \\
 \hline
 102
 \end{array}$$

Add the ones.
Regroup if necessary.

$$\begin{array}{r}
 1 \\
 1,038 \\
 94 \\
 + 722 \\
 \hline
 4
 \end{array}$$


Add the whole numbers.
Regroup if necessary.

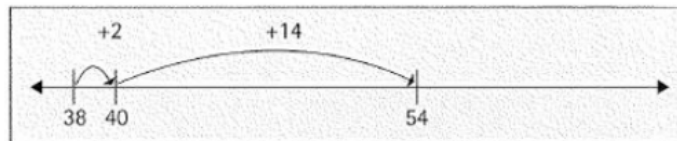
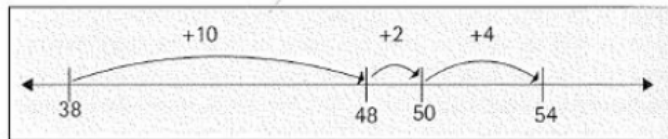
$$\begin{array}{r}
 121 \\
 54.73 \\
 54.56 \\
 54.32 \\
 + 54.54 \\
 \hline
 218.15
 \end{array}$$



Imagine taking 28 away. What part remains?

$$\begin{array}{r}
 87 + 5 = 92 \\
 \swarrow \quad \searrow \quad \swarrow \quad \searrow \\
 80 \quad 7 \quad 3 \quad 2
 \end{array}$$

$$38 + 16$$



Expanded Form Addition

$$\begin{array}{r}
 257 \quad 200 + 50 + 7 \\
 +428 \quad +400 + 20 + 8 \\
 \hline
 \quad \quad 600 + 70 + 15 \\
 \quad \quad 600 + 85 \\
 \quad \quad 685
 \end{array}$$

Learning and Teaching...

A Commitment to a Conceptual Approach

Ongoing Evaluation of Programing and Resources

Ongoing Support for Students, Teachers, and Parents

Has a math problem ever made you feel like this

If you have 4 pencils and I have 7 apples how many pancakes will fit on the roof? Purple, because aliens don't wear hats.



Geneva 304

Colorado Core Math Implementation Update

We're not just talking numbers. We're talking math. We're talking about the math that matters. We're talking about the math that makes a difference.

LearningAndTeaching@geneva304.org

Praty O'Neill - Assistant Superintendent
Dr. Andy Smith - Director
Dennis Peterson - Secondary Math Facilitator

$$\begin{array}{r} 3,995 + 4,286.9 \\ 3,995 \\ \hline 7,281.9 \\ 2096 + 4(2,000) + 4(240) + 4(1,240) \end{array}$$

$$\begin{array}{r} 10 \\ 10 \\ \hline 20 \\ 10 \\ 10 \\ \hline 40 \\ 10 \\ 10 \\ \hline 60 \\ 10 \\ 10 \\ \hline 80 \\ 10 \\ 10 \\ \hline 100 \end{array}$$

Conceptual NOT Computational

Some background on the CCSS – Math
 Developing Student – 2017
 2014-2017: 2012-2016
 National Governors' Association – 2010
 Common Core Standards
 College and Career Readiness
 Mathematically Proficient

Key Themes
 Focus
 Coherence
 Rigor

The 8 Mathematical Practices

Big Ideas
 Deep Conceptual Understanding
 Creative, Analytic Thinking
 Self-Directed, Persistent Learning
 Transferable Skills

Working Toward Our Vision...
 Collaborative Work
 "Unpacking"
 Resource Review
 Consultant Supported Covertive Work
 Development of District-Based Resources
 Conceptual Development Year in 2013

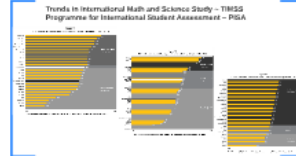
2012-2013 School Year – Conceptual Development
 Math Facilitator
 Coordinated Math Committee Work
 Teacher Collaborations
 Development of District-Level Frameworks
 "Unpacking"
 Practice-Focused Skills and Strategies

The Need for a "Playbook"
 A Day in the "Real"
 Short-Term Planning
 Practice-Focused
 Analyzers and the Problem-Solving Cycle

Eureka Math – A Tool to Support Conceptual Development

Grade	1	2	3	4	5
Number and Operations in Base Ten	✓	✓	✓	✓	✓
Number and Operations – Fractions				✓	✓
Geometry				✓	✓
Algebra				✓	✓
Statistics and Probability				✓	✓

Learning and Teaching...
 A Commitment to a Conceptual Approach
 Ongoing Evaluation of Programming and Resources
 Ongoing Support for Students, Teachers, and Parents



Regularity of the Practice
 The color – Math – represents goal instruction for skills.
 Let's explore how...

Diagram illustrating mathematical concepts and problem-solving strategies, including equations like $100 + 100 = 200$ and $100 + 100 = 200$.

Continuum Coverage of Assessment Content
 Average Coverage in US – 52% of Assessment Content
 Average Coverage in Top Countries – 58% of Assessment Content

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