Tompkins Seneca Tioga BOCES
An Educational Plus

Madison Central School

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The Common Core Learning Standards: Overview and Shifts

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Session Objectives

As a result of this training, participants will:

- ✓ Develop an understanding of the current reform efforts and how it will impact curriculum, instruction, and assessment;
- ✓ Gain familiarity with the 12 shifts associated with the Common Core Learning Standards;
- ✓ Know where to locate resources that will aid in deepening understanding of the CCLS.

Source:

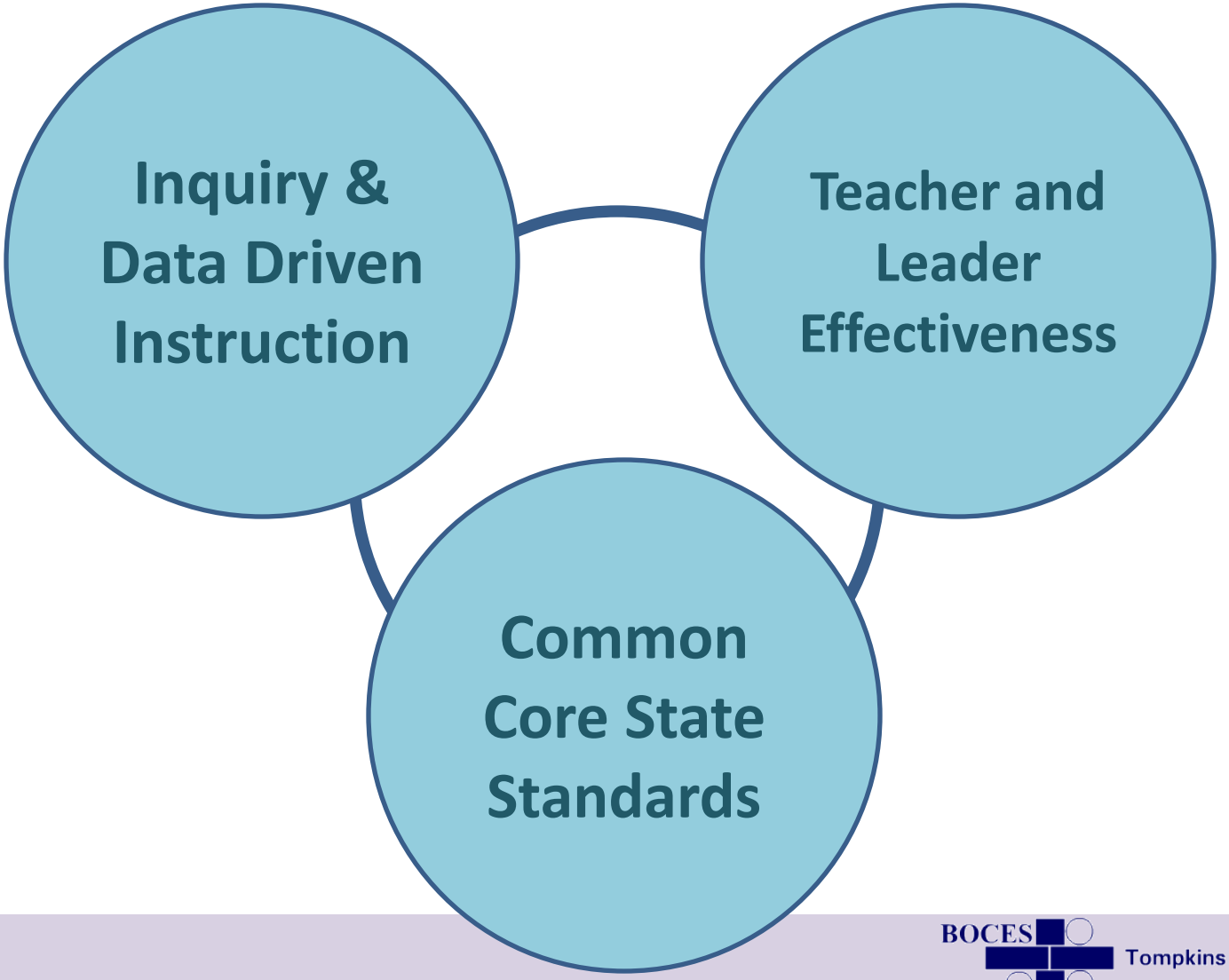
Race to the Top

The Race to the Top emphasizes the following reform areas:

- Designing and implementing **rigorous standards** and **high-quality assessments**;
- Attracting and keeping **great teachers and leaders** in America's classrooms;
- Supporting **data systems** that inform decisions and improve instruction;
- Using **innovation and effective approaches** to turn-around struggling schools;
- **Demonstrating and sustaining** education reform.

Source: http://www.whitehouse.gov/the-press-office/fact-sheet-race-top

Race to the Top



Source:

Sitts, A. 2012. asitts@tstboces.org

The Common Core State Standards Initiative

- Beginning in the spring of 2009, Governors and state commissioners of education from 48 states, 2 territories and the District of Columbia committed to developing a common core of state K-12 English-language arts (ELA) and mathematics standards.
- The **Common Core State Standards Initiative (CCSSI)** is a state-led effort coordinated by the National Governors Association (NGA) and the Council of Chief State School Officers (CCSSO).

Source: www.corestandards.org

Why Common Core State Standards?

- **Preparation:** The standards are college- and career-ready. They will help prepare students with the knowledge and skills they need to succeed in education and training after high school.
- **Competition:** The standards are internationally benchmarked. Common standards will help ensure our students are globally competitive.
- **Equity:** Expectations are consistent for all – and not dependent on a student's zip code.
- **Clarity:** The standards are focused, coherent, and clear. Clearer standards help students (and parents and teachers) understand what is expected of them.
- **Collaboration:** The standards create a foundation to work collaboratively across states and districts, pooling resources and expertise, to create curricular tools, professional development, common assessments and other materials.

Source: www.corestandards.org

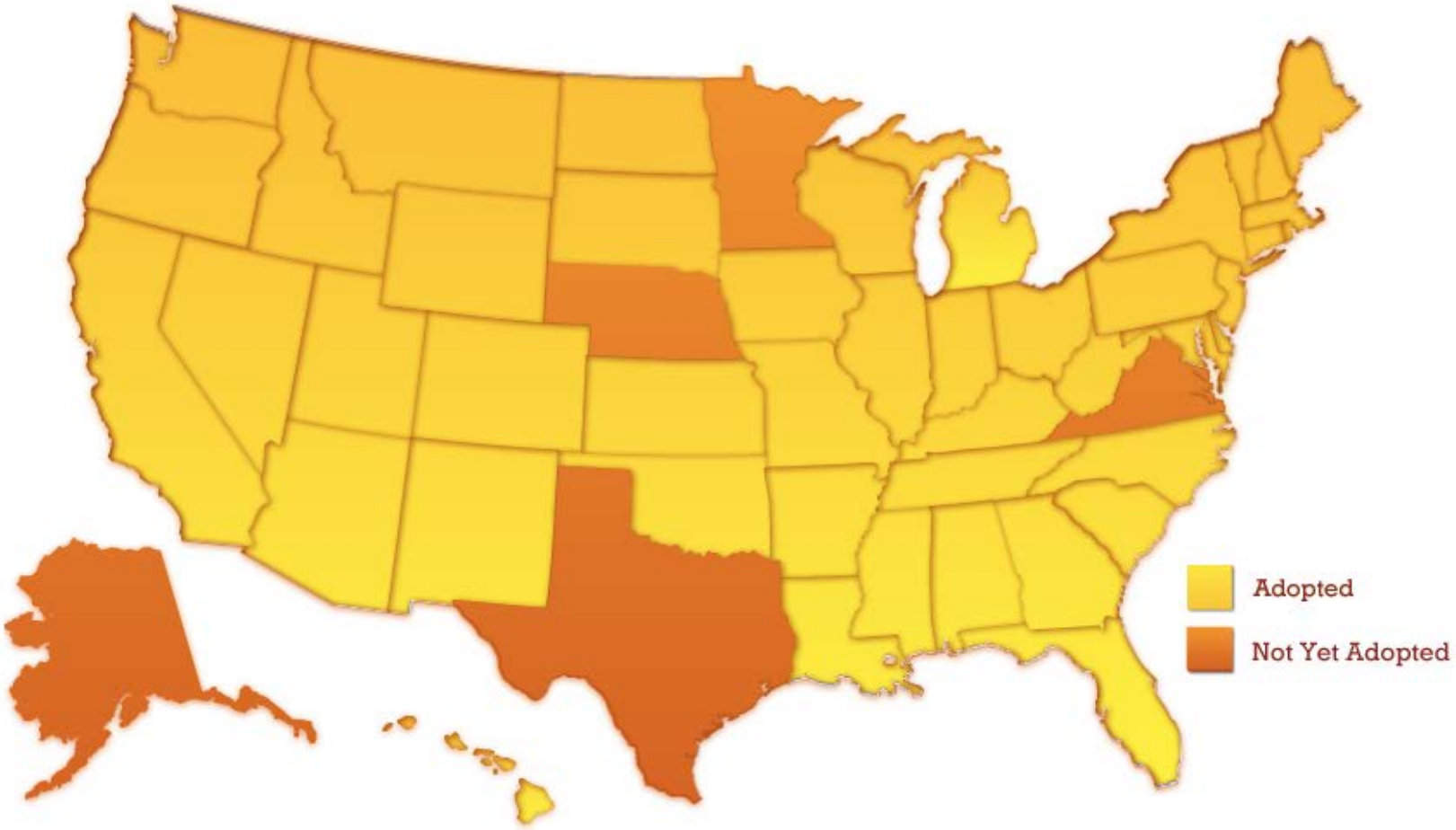
Common Core State Standards Design

Building on the strength of current state standards, the CCSS are designed to be:

- Focused, coherent, clear and rigorous
- Internationally benchmarked
- Anchored in college and career readiness
- Evidence and research based

Source: www.corestandards.org

CCSS Participation by State



Source: http://www.corestandards.org/in-the-states

New York State Assessment Transition Plan: ELA and Mathematics

As of March 12, 2012 (Subject to Revision)

Assessment – Subject / Grade	2011-12	2012-13	2013-14	2014-15
ELA				
Grades 3-8	Aligned to 2005 Standards	Aligned to the Common Core		PARCC[1]
Grade 11 Regents	Aligned to 2005 Standards		Regents Exam Aligned to the Common Core[2]	Regents Exam Aligned to the Common Core / PARCC[1, 2]
Math				
Grades 3-8	Aligned to 2005 Standards	Aligned to the Common Core		PARCC[1]
Algebra I		Aligned to 2005 Standards	Regents Exams Aligned to the Common Core[2,3]	Regents Exams Aligned to the Common Core / PARCC[1, 2, 3]
Geometry				
Algebra II			Aligned to the 2005 Standards	
Additional State Assessments				
NYSAA[4]	Aligned to 2005 Standards		Aligned to the Common Core	NCSC[5]
NYSESLAT	Aligned to 1996 Standards	Aligned to the Common Core		

[1] The PARCC assessments are scheduled to be operational in 2014-15 and are subject to adoption by the New York State Board of Regents. The PARCC assessments are still in development. All PARCC assessments will be aligned to the Common Core.

[2]The PARCC consortium is developing ELA and mathematics assessments that will cover grades 3-11. New York State will continue to monitor the development of these assessments to determine how the PARCC assessments might intersect with the Regents Exams. Note that all new Regents Exams and PARCC assessments will be implemented starting with the end-of-year administration, rather than the winter or summer administrations.

[3] The names of New York State's Mathematics Regents Exams are expected to change to reflect the new alignment of these assessments to the Common Core. For additional information about the upper-level mathematics course sequence and related standards, see the "Traditional Pathway" section of Common Core Mathematics Appendix A (http://engageny.org/news/traditional-course-pathway-for-high-school-mathematics-courses-approved/).

[4]This transition plan is specific to the NYSAA in ELA and mathematics.

[5]New York State is a member of the NCSC national alternate assessment consortium that is engaged in research and development of new alternate assessments for alternate achievement standards. The NCSC assessments are scheduled to be operational in 2014-15 and are subject to adoption by the New York State Board of Regents.

Source: http://engageny.org/resource/common-core-implementation-timeline/

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The Six Shifts of the Common Core ELA

Shift 1

Balancing Informational and Literary Texts

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ELA Reading Text Types

Literature – [RL]

K-5: CCLS (p. 18)

Informational Text – [RI]

K-5: CCLS (p. 21)

Distribution of Literary and Informational Passages by Grade in the 2009 NAEP Reading Framework

Grade	Literary	Informational
4	50%	50%
8	45%	55%
12	30%	70%

What is Literary Non-fiction?

"the drama of fiction and force of fact"

What does it look like?

Reportage, memoir, personal essay, meditations on ideas, literary journalism, nature writing, city writing, travel writing, journals or letters, cultural commentary, hybrid forms, and our founding documents.

http://www.barriejeanborich.net/creativeNonfiction.html

Range of Text Types for K–5

Students in K–5 apply the Reading standards to the following range of text types, with texts selected from a broad range of cultures and periods.

Literature			Informational Text
Stories	**Dramas**	**Poetry**	**Literary Nonfiction and Historical, Scientific, and Technical Texts**
Includes children's adventure stories, folktales, legends, fables, fantasy, realistic fiction, and myth	Includes staged dialogue and brief familiar scenes	Includes nursery rhymes and the subgenres of the narrative poem, limerick, and free verse poem	Includes biographies and autobiographies; books about history, social studies, science, and the arts; technical texts, including directions, forms, and information displayed in graphs, charts, or maps; and digital sources on a range of topics

CCLS for ELA & Literacy… grades K-5, p. 42

"The standards emphasize arguments (such as those in the Founding Documents) and other literary nonfiction that is built on informational text structures rather than narrative literary nonfiction that are structured as stories (such as memoirs or biographies)."

•Grade 3-12 Publishers' Criteria, p.5

Literary, Informational, or Literary Non-Fiction

- Read the three excerpts from Appendix B of the CCLS on your own.

- Classify the pieces as literary, informational, or literary non-fiction in your mind.

- Share out with your table. Discuss the elements of each text type and the demands on the reader.

Shift 2: Knowledge in the Disciplines

Expectation of rigorous domain-specific literacy instruction

Reading & Writing Literacy Standards

- Complement, not replace content standards

Depending on text rather than referring to it

- Read a president's speech & write a response
- Read scientific papers & write an analysis

Think sophisticated non-fiction

- Analyze and evaluate texts within disciplines
- Gain knowledge from texts that convey complex information through diagrams, charts, evidence, & illustrations

Gondek, J. 2012. jgondek@tstboces.org

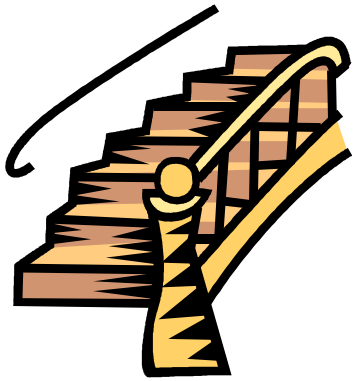
Shift 2:

Knowledge in the Disciplines

Literacy is "the spine that holds everything together in all subject areas…"

Phillips & Wong, *Gates Foundation*

Shift 3



Staircase of Complexity

- Growth “steps” for each grade level
- Grade appropriate text at the center of instruction
- Close and careful reading with scaffolded supports for students reading below level.

Literal vs. Inferential

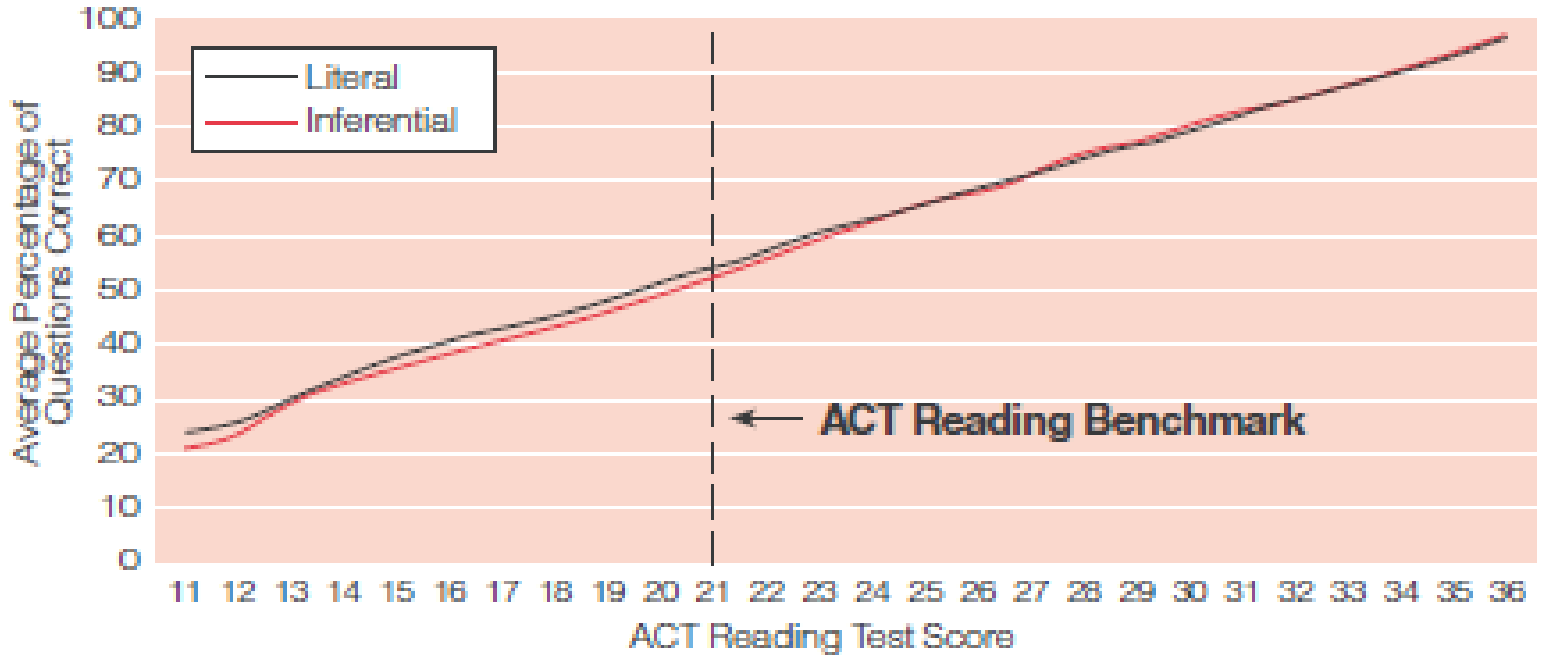


Figure 10: Performance on the ACT Reading Test by Comprehension Level (Averaged across Seven Forms)

From *Reading Between the Lines* http://act.org/research/policymakers/pdf/reading_summary.pdf

Textual Elements

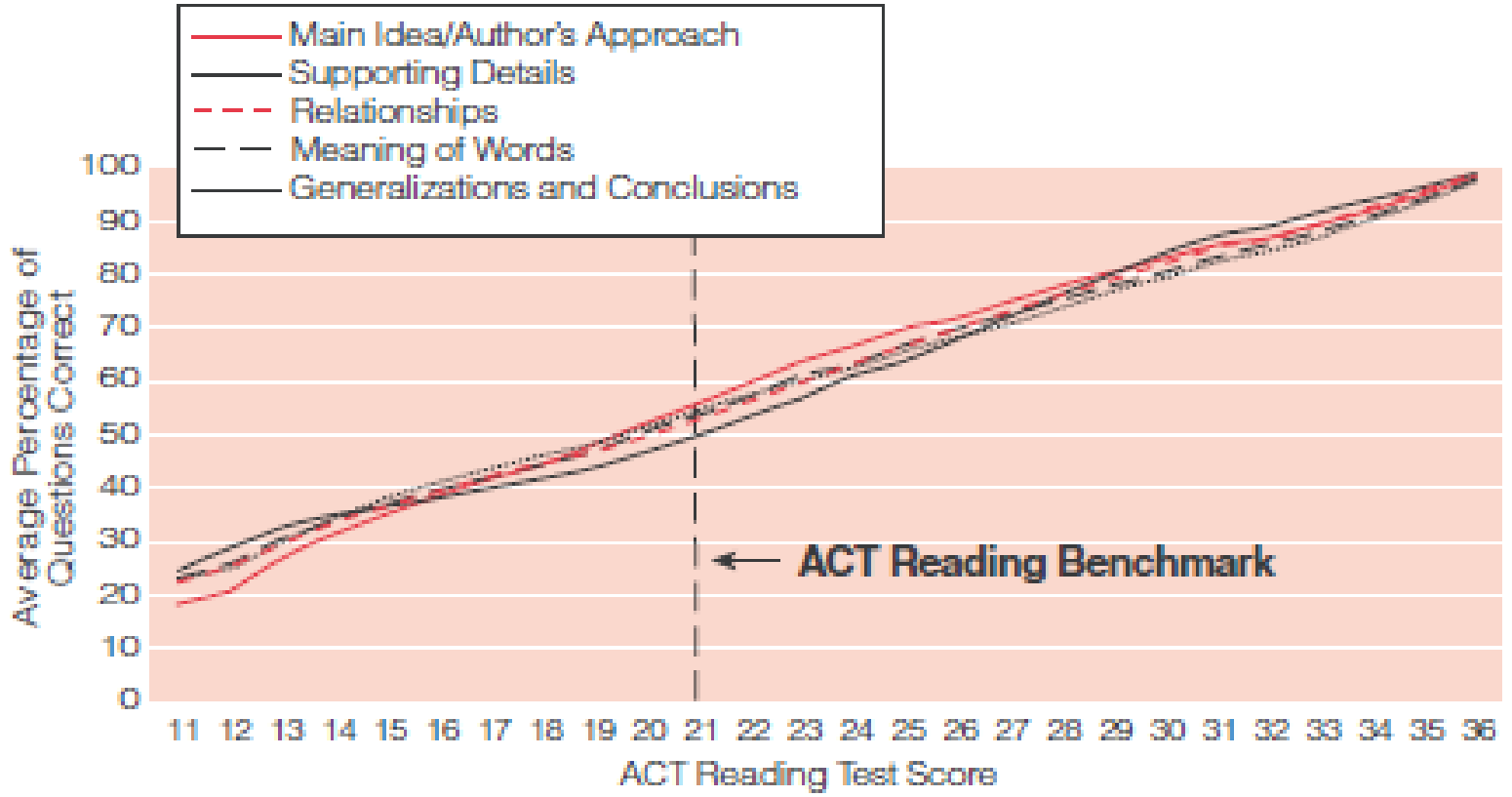
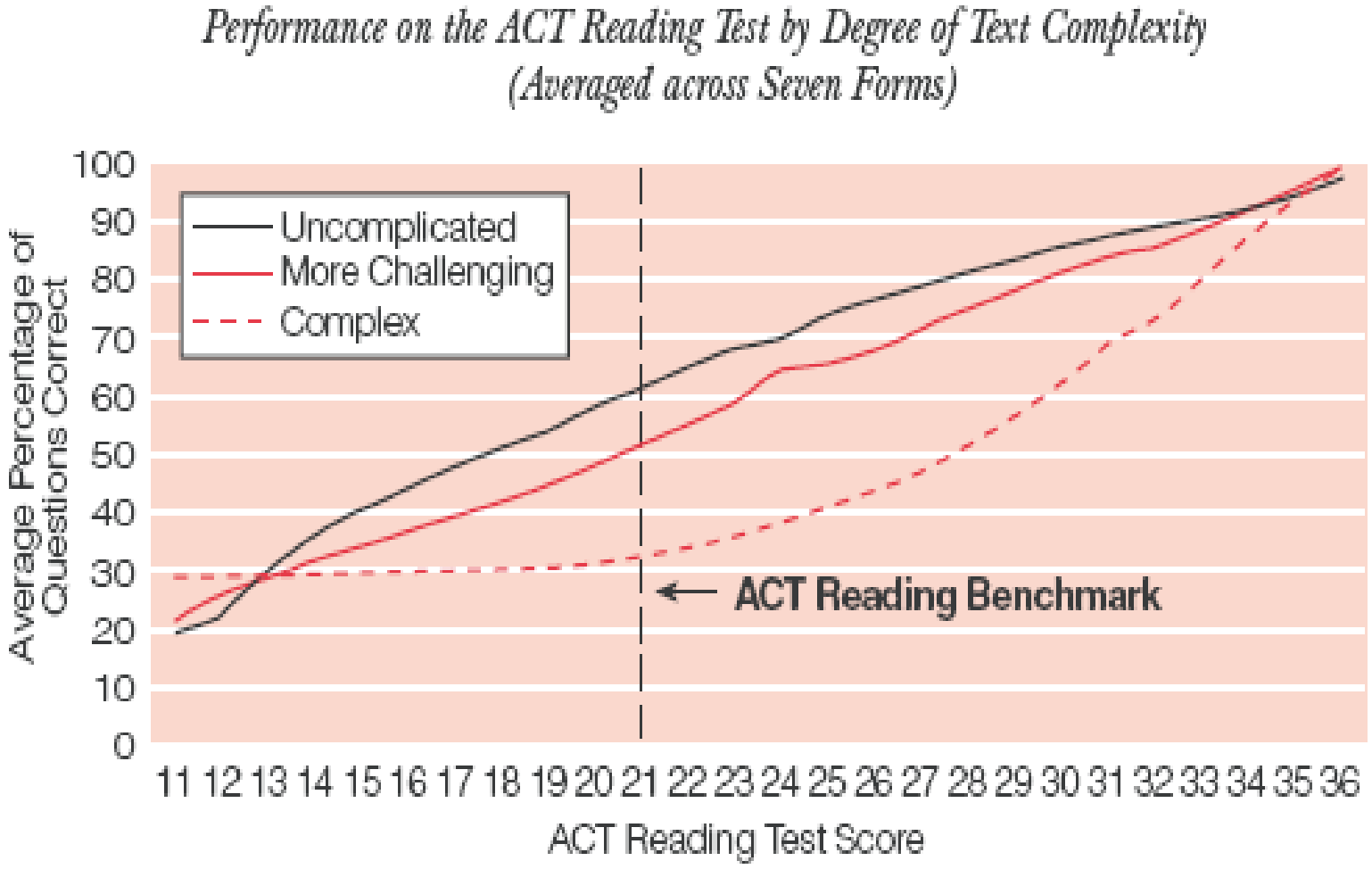


Figure 11: Performance on the ACT Reading Test by Textual Element (Averaged across Seven Forms)

From *Reading Between the Lines* http://act.org/research/policymakers/pdf/reading_summary.pdf

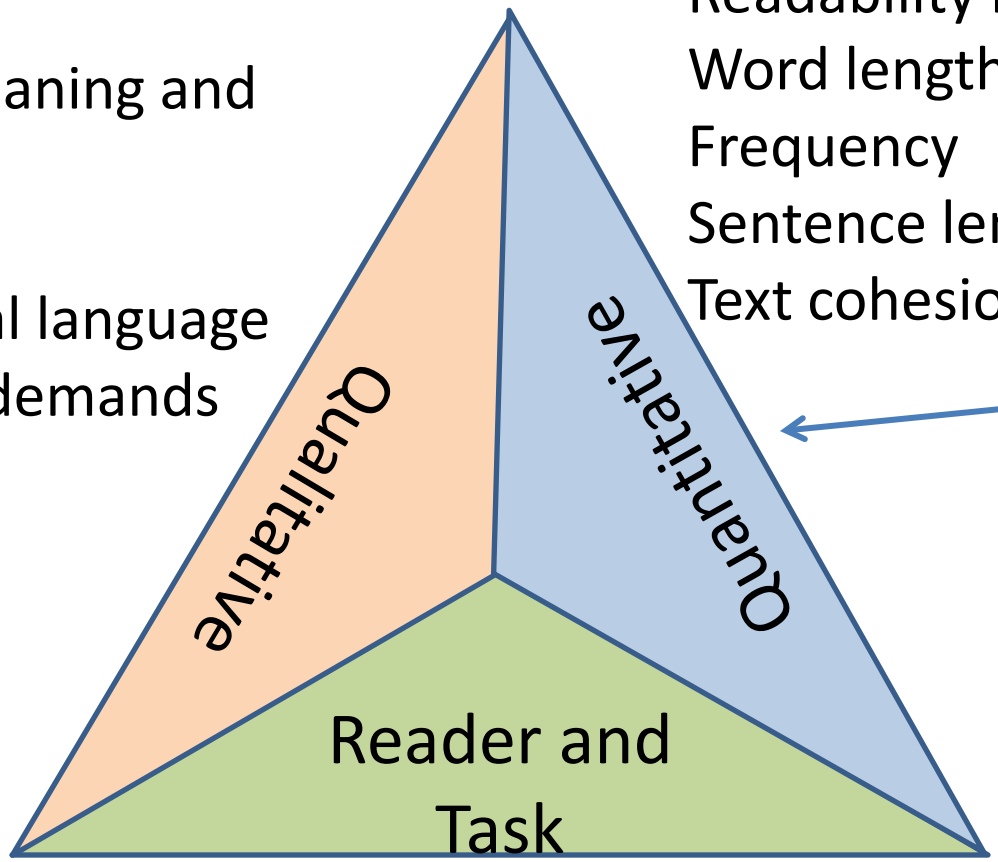
Text Complexity



From *Reading Between the Lines* http://act.org/research/policymakers/pdf/reading_summary.pdf

Standard's Model of Text Complexity

Levels of meaning and purpose
Structure
Conventional language
Knowledge demands



Readability Measures:
Word length
Frequency
Sentence length
Text cohesion

Lexiles

Reader variables *(motivation, knowledge, experiences)*
Task variables *(purpose, complexity generated by assigned task, and questions posed.)*

Gondek, J. 2012. jgondek@tstboces.org

Text Complexity Grade Bands and Associated Lexile Ranges (in Lexiles)

Text Complexity Grade Band in the Standards	Old Lexile Ranges	Lexile Ranges aligned to CCR expectations
K-1	N/A	N/A
2-3	450-725	450-790
4-5	645-845	770-980
6-8	860-1010	955-1155
9-10	960-1115	1080-1305
11-CCR	1070-1220	1215-1355

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Qualitative Rubrics

TEXT COMPLEXITY: QUALITATIVE MEASURES RUBRIC

INFORMATIONAL TEXT

Text Title: _____ **Text Author:** _____

PURPOSE			
High	**Middle High**	**Middle Low**	**Low**
☐ Complex, implied, and/or difficult to determine; may have multiple purposes	☐ Implied, but can be inferred; may have multiple purposes	☐ Implied, but easy to identify based on context	☐ Explicitly stated
STRUCTURE			
High	**Middle High**	**Middle Low**	**Low**
☐ **Organization:** highly complex; implicit connections between ideas; conforms to the conventions of a specific content area or discipline ☐ **Text Features:** if used, are essential in understanding content ☐ **Use of Graphics:** if used, interpretation of complex graphics essential to understanding the text; may also provide information not conveyed in the text*	☐ **Organization:** complex; some explicit connections between ideas; may exhibit traits common to a specific content area or discipline ☐ **Text Features:** if used, greatly enhance the reader's understanding of content ☐ **Use of Graphics:** if used, some graphics are complex and may occasionally be essential to the understanding of the text	☐ **Organization:** may be complex; largely explicit connections between ideas; generally follows the conventions of the genre ☐ **Text Features:** if used, enhance the reader's understanding of content ☐ **Use of Graphics:** if used, graphics are mostly simple and supplementary to understanding the text	☐ **Organization:** simple; explicit connections between ideas; conforms to the conventions of the genre ☐ **Text Features:** if used, help the reader navigate and understand content but are not essential ☐ **Use of Graphics:** if used, graphics are simple and unnecessary to understanding the text
LANGUAGE			
High	**Middle High**	**Middle Low**	**Low**
☐ **Conventionality:** contains abstract and/or figurative language or irony ☐ **Clarity:** dense and complex language that is generally unfamiliar, archaic, discipline-specific, or overly academic; language may be ambiguous or purposefully misleading	☐ **Conventionality:** occasionally contains abstract and/or figurative language or irony ☐ **Clarity:** somewhat complex language that is occasionally unfamiliar, archaic, discipline-specific, or overly academic	☐ **Conventionality:** largely contemporary, conversational language ☐ **Clarity:** largely explicit, familiar language; easy-to-understand and rarely archaic, discipline-specific, or overly academic	☐ **Conventionality:** contemporary, conversational language ☐ **Clarity:** clear, explicit, literal, easy-to-understand language
KNOWLEDGE DEMANDS			
High	**Middle High**	**Middle Low**	**Low**
☐ **Subject Matter Knowledge:** requires extensive, perhaps specialized or even theoretical discipline-specific content knowledge ☐ **Intertextuality:** many references to/citations of other texts or outside ideas, theories, etc.	☐ **Subject Matter Knowledge:** requires moderate levels of discipline-specific content knowledge; some theoretical knowledge may enhance understanding ☐ **Intertextuality:** some references to/citations of other texts or outside ideas, theories, etc.	☐ **Subject Matter Knowledge:** everyday, practical knowledge is largely necessary; requires some discipline-specific content knowledge ☐ **Intertextuality:** few references to/citations of other texts or outside ideas, theories, etc.	☐ **Subject Matter Knowledge:** requires only everyday, practical knowledge and familiarity with conventions of the genre ☐ **Intertextuality:** no references to/citations of other texts or outside ideas, theories, etc.

*NOTE: Many books for the youngest students rely heavily on graphics to convey meaning and are an exception to this generalization.

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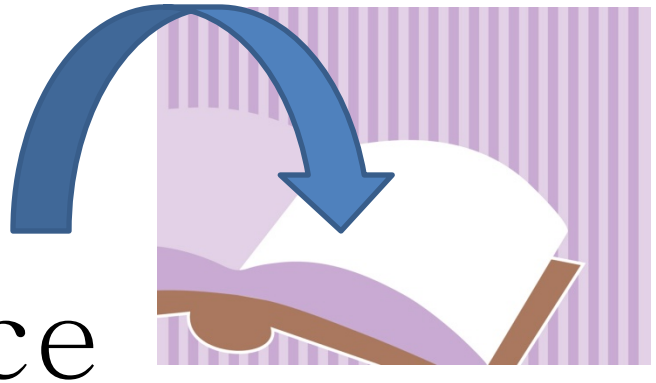
Shift 4

Text-Based Evidence



- Questions tied directly to the text, but extend beyond the literal
- Students must cite text to support answers
- Personal opinions, experiences, and connections to the text are minimized in favor of what the text actually says or doesn't say

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Shift 5

Look to Appendix C: Samples of Student Writing

Writing from Sources

Using Evidence To:

- ✓Inform
- ✓Make arguments
- ✓Respond to ideas, events, facts, and arguments presented in text

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Writing from sources: 3 Text Types and Purposes

CCLS (pp. 55)

Argument	Supporting a claim with sound reasoning and relevant evidence
Informational	Increase subject knowledge
Explanatory	Explain a process Enhance comprehension
Narrative	Conveys experience i.e. fictional stories, memoirs, anecdotes, autobiographies

Your Current Classroom Practice:

To Persuade	To Explain	To Convey Experience
?	?	?
10-15%	**20-30%**	**55-70%**

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Distribution of Communicative Purposes by Grade in the 2011 NAEP Framework

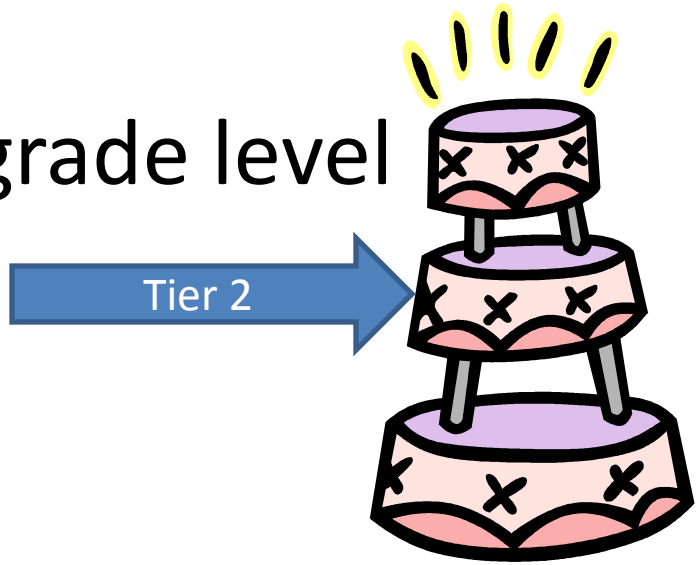
Grade	To Persuade	To Explain	To Convey Experience
4	30%	35%	35%
8	35%	35%	30%
12	40%	40%	20%

Shift 6

Academic Vocabulary

- Pivotal and commonly found words

- Build vocabulary to access grade level complex text



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Volcanoes

(Grade 4-5 Text Complexity Band)

Highlight and Underline the important vocabulary terms needed to understand this text.

TIER TWO

- ❑Layers
- ❑Spouted
- ❑Pours forth
- ❑Surface

TIER THREE

- ❑Mantle
- ❑Lava
- ❑Volcano
- ❑Magma

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Further Resources:

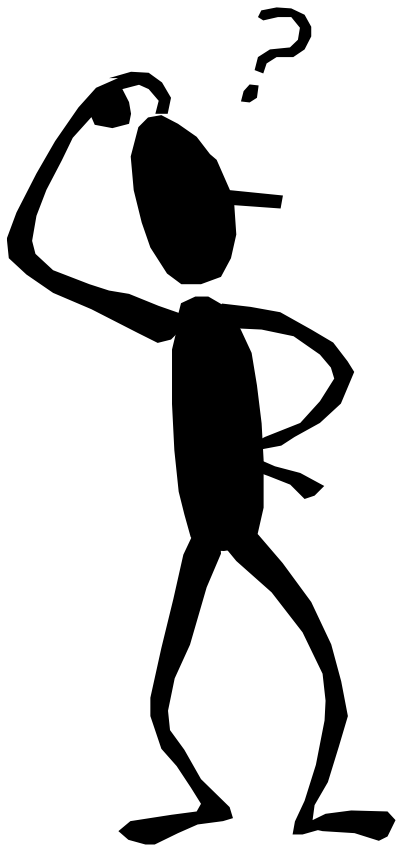
Engage New York Website:

www.engageNY.org

TST BOCES Network Team Website:

http://www.tstboces.org/node/182

Questions



The Common Core State Standards in Mathematics

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Common Core State Standards Mathematics

Two types of standards:

- **Mathematical Practice**

  (recurring throughout the grades)

- **Mathematical Content**

  (different at each grade level)

Standards for Mathematical Practice

- Similar to the mathematical process that NCTM addresses in the Process Standards in *Principles and Standards for School Mathematics.*
- Describe mathematical "habits of mind"
- Standards for mathematical proficiency: reasoning, problem solving, modeling, decision making, and engagement
- Connect with content standards in each grade
- Woven throughout the curriculum and taught in conjunction with content and procedures

Source:

Standards for Mathematical Practice

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.

Standards for Mathematical Content

- **Standards** define what students should understand and be able to do.
- **Clusters** are groups of related standards. Note that standards from different clusters may sometimes be closely related, because mathematics is a connected subject.
- **Domains** are larger groups of related standards. Standards from different domains may sometimes be closely related.

Reading the Grade Level Standards

Mathematics | Grade 3

In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing unde[r]standing of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure[ ]f rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes.

(1) Students develop an understanding of the meanings of multiplicati[ ]nd problems involving equal-sized groups, arrays, and area models; multi[ ] finding an unknown factor in these situations. For equal-sized group[ ]ber of groups or the unknown group size. Students use properties of o[ ] increasingly sophisticated strategies based on these properties to s[ ]git factors. By comparing a variety of solution strategies, students l[ ]

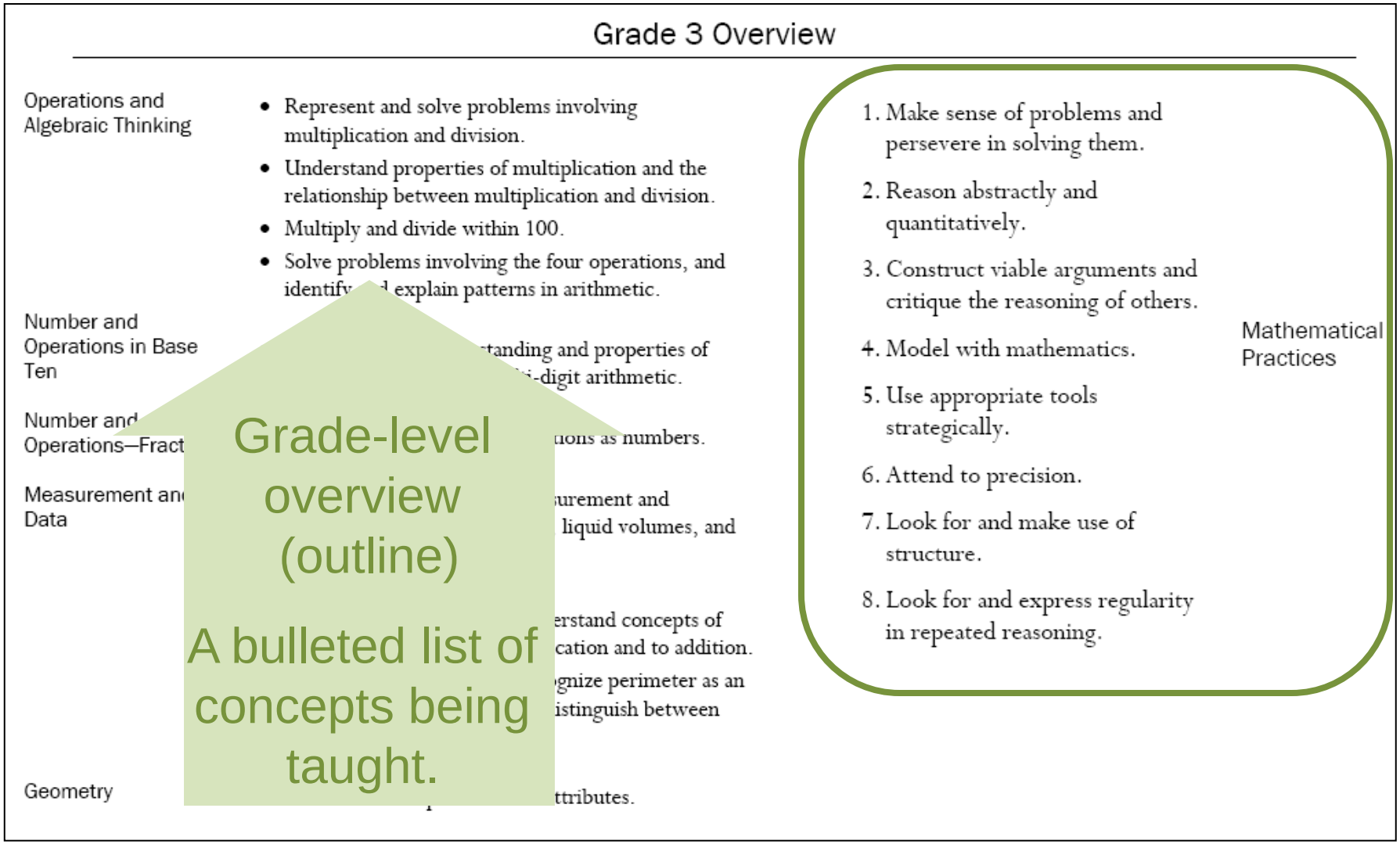
(2) Students develop an understanding of fractions, beginning[ ]g built out of unit fractions, and they use fractions along with visual[ ] understand that the size of a fractional part is relative to the size of [ ] could be less paint than $1/3$ of the paint in a larger bucket, but $1/3$ of[ ]hen the ribbon is divided into 3 equal parts, the parts are longer than when[ ]le to use fractions to represent numbers equal to, less than, and greater tha[ ] fractions by using visual fraction models and strategies based on noticing e[ ] numerators or denominators.

(3) Students recognize area as an attribute of two-dimensional regions. T[ ]y measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps o[ ] overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle.

Grade-level focus (big ideas)

A couple of paragraphs describing the focus of this grade level

Reading the Grade Level Standards



Reading the Grade Level Standards

Domain

Operations and Algebraic Thinking 3.OA

Represent and solve problems involving multiplication and division.

1. Interpret products of whole numbe[illegible] g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total nu[illegible] f objects can be expressed as* 5 × 7.

Cluster

2. Interpret whole-number quotients of whc[illegible]s the number of objects in each share when 56 objects are partitioned equally into 8 s[illegible]n 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as* 56 ÷ 8.

3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using draw[illegible]gs and equations with a symbol for the unknown number to represent the problem.[14]

4. Determine the unknown whole number in a multip[illegible]or division equation relating three whole numbers. *For example, determine the unknown number that makes the equa[illegible]= 48, 5 = □ ÷ 3, 6 × 6 = ?.*

Standard

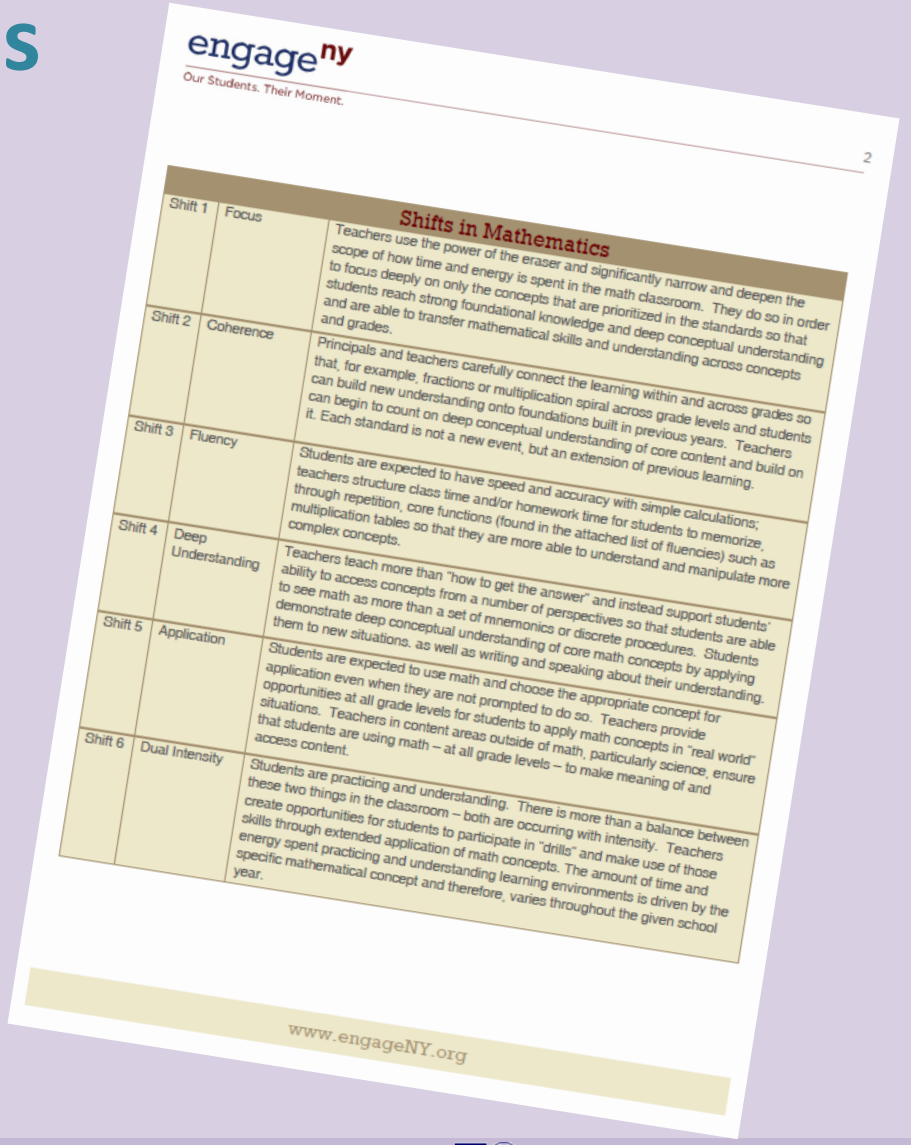
Understand properties of multiplication and [illegible]tiplication and division.

5. Apply properties of operations as strategies to multiply and divide.[15] *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)*

6. Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*

Six Instructional Shifts in the CCSSM

- Focus
- Coherence
- Fluency
- Deep Understanding
- Application
- Dual Intensity



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2

Shifts in Mathematics

Shift 1	Focus	Teachers use the power of the eraser and 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 so that students reach strong foundational knowledge and deep conceptual understanding and are able to transfer mathematical skills and understanding across concepts and grades.
Shift 2	Coherence	Principals and teachers carefully connect the learning within and across grades so that, for example, fractions or multiplication spiral across grade levels and students can build new understanding onto foundations built in previous years. Teachers can begin to count on deep conceptual understanding of core content and build on it. Each standard is not a new event, but an extension of previous learning.
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 (found in the attached list of fluencies) such as multiplication tables so that they are more able to understand and manipulate more complex concepts.
Shift 4	Deep Understanding	Teachers teach more than "how to get the answer" and instead support students' ability to access concepts from a number of perspectives so that students are able to see math as more than a set of mnemonics or discrete procedures. Students demonstrate deep conceptual understanding of core math concepts by applying them to new situations. as well as writing and speaking about their understanding.
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. Teachers provide opportunities at all grade levels for students to apply math concepts in "real world" situations. Teachers in content areas outside of math, particularly science, ensure that students are using math – at all grade levels – to make meaning of and access content.
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. Teachers create opportunities for students to participate in "drills" and make use of those skills through extended application of math concepts. The amount of time and energy spent practicing and understanding learning environments is driven by the specific mathematical concept and therefore, varies throughout the given school year.

www.engageNY.org

Source: http://http://engageny.org/wp-content/uploads/2012/08/common-core-shifts.pdf

Focus

Focus strongly where the standards focus.

Focus

- Focus on fewer topics in greater depth
  - Higher performing countries….
    - ….focus on fewer topics
    - ….share 3 topics in common

Grade 4

Major	Supporting	Additional
Operations and Algebraic Thinking ▪ Use the four operations with whole numbers to solve problems. **Number and Operations in Base Ten** ▪ Generalize place value understanding for multi-digit whole numbers. ▪ Use place value understanding and properties of operations to perform multi-digit arithmetic. **Number and Operations – Fractions** ▪ Extend understanding of fraction equivalence and ordering. ▪ Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. ▪ Understand decimal notation for fractions, and compare decimal fractions.	**Operations and Algebraic Thinking** □ Gain familiarity with factors and multiples. [3] **Measurement and Data** □ Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. □ Represent and interpret data. [4]	**Operations and Algebraic Thinking** ○ Generate and analyze patterns. **Measurement and Data** ○ Geometric measurement: understand concepts of angles and measure angles. **Geometry** ○ Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Depth Opportunities:

NBT 5, 6; NF 1, 3, 4

Domain

Cluster

Source: http://engageny.org/wp-content/uploads/2012/03/nys-math-emphases-k-8.pdf

Coherence

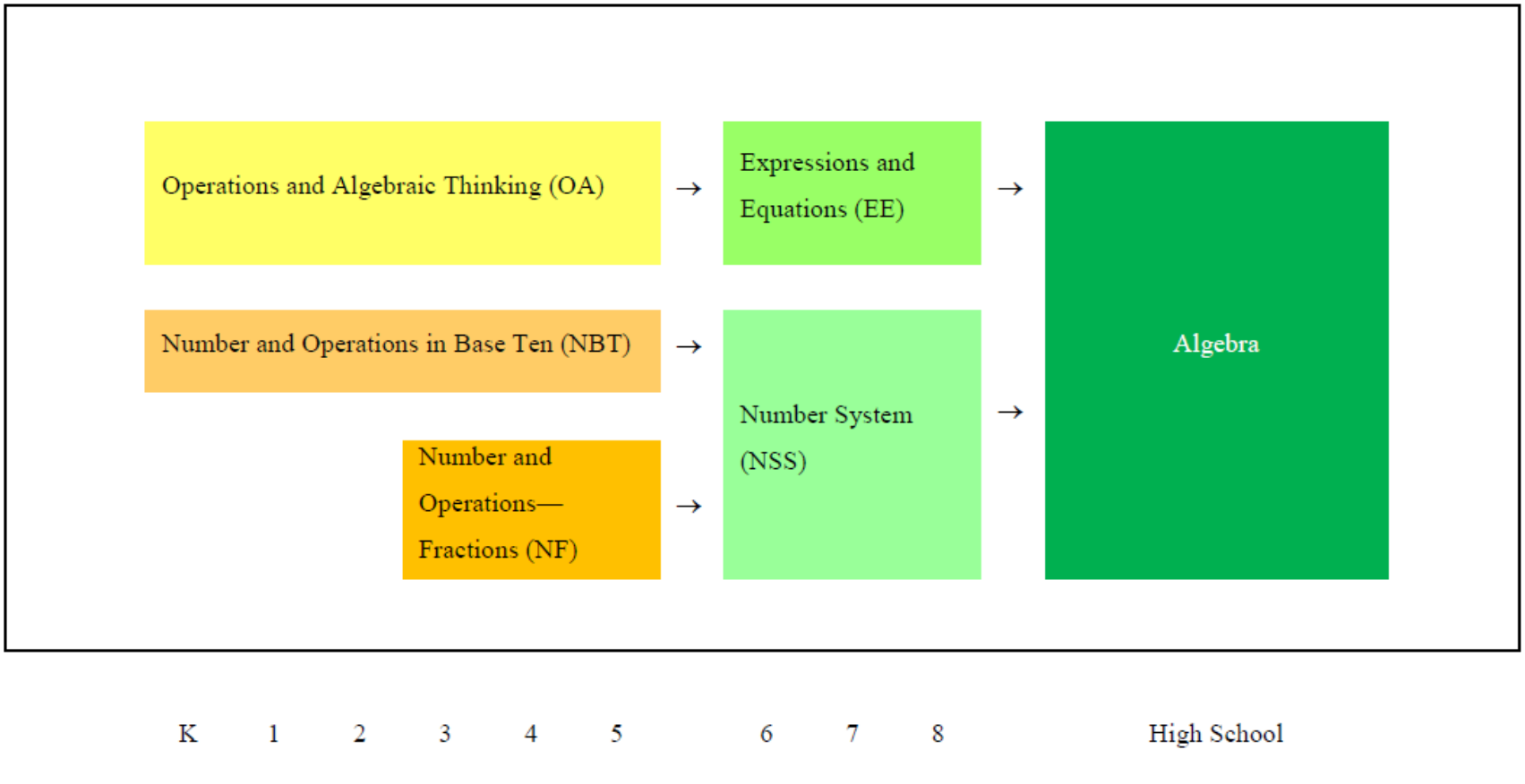
Focus strongly where the standards focus.

Think across grades and link to major topics within grades.

Source:

Coherence

- Each concept in each grade builds upon what you learned before
  - Learn about related topics in a way that reinforces the core learning
  - A constant effort to rethink what we learn in math, so it links to core understanding



Source: http://ime.math.arizona.edu/2011-12/ccssatlas_2011_07_06_0956_p1p2.pdf

Progressions Documents

– Bill McCallum

– U of Arizona

http://ime.math.arizona.edu/progressions/

Grade 4

At Grade 4, students extend their work in the base-ten system. They use standard algorithms to fluently add and subtract. They use methods based on place value and properties of operations supported by suitable representations to multiply and divide with multi-digit numbers.

Generalize place value understanding for multi-digit whole numbers In the base-ten system, the value of each place is 10 times the value of the place to the immediate right.[4.NBT.1] Because of this, multiplying by 10 yields a product in which each digit of the multiplicand is shifted one place to the left.

To read numerals between 1,000 and 1,000,000, students need to understand the role of commas. Each sequence of three digits made by commas is read as hundreds, tens, and ones, followed by the name of the appropriate base-thousand unit (thousand, million, billion, trillion, etc.). Thus, 457,000 is read "four hundred fifty seven thousand."[4.NBT.2] The same methods students used for comparing and rounding numbers in previous grades apply to these numbers, because of the uniformity of the base-ten system.

Decimal notation and fractions Students in Grade 4 work with fractions having denominators 10 and 100.[4.NF.5] Because it involves partitioning into 10 equal parts and treating the parts as numbers called one tenth and one hundredth, work with these fractions can be used as preparation to extend the base-ten system to non-whole numbers.

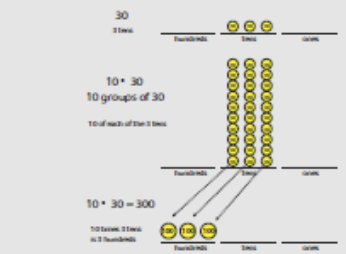
Using the unit fractions $\frac{1}{10}$ and $\frac{1}{100}$, non-whole numbers like $23\frac{7}{10}$ can be written in an expanded form that extends the form used with whole numbers: $2\times10+3\times1+7\times\frac{1}{10}$.[4.NF.4b] As with whole-number expansions in the base-ten system, each unit in this decomposition is ten times the unit to its right. This can be connected with the use of base-ten notation to represent $2\times10+3\times1+7\times\frac{1}{10}$ as 23.7. Using decimals allows students to apply familiar place value reasoning to fractional quantities.[4.NF.6] The Number and Operations—Fractions Progression discusses decimals to hundredths and comparison of decimals[4.NF.7] in more detail.

The decimal point is used to signify the location of the ones place, but its location may suggest there should be a "oneths" place to its right in order to create symmetry with respect to the decimal point. However, because one is the basic unit from which the other base-ten units are derived, the symmetry occurs instead with respect to the ones place.

Ways of reading decimals aloud vary. Mathematicians and scientists often read 0.15 aloud as "zero point one five" or "point one five." (Decimals smaller than one may be written with or without a zero before the decimal point.) Decimals with many non-zero digits

4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.

10 × 30 represented as 3 tens each taken 10 times

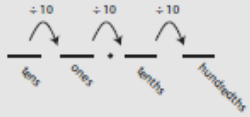


Each of the 3 tens becomes a hundred and moves to the left. In the product, the 3 in the tens place of 30 is shifted one place to the left to represent 3 hundreds. In 300 divided by 10 the 3 is shifted one place to the right in the quotient to represent 3 tens.

4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

4.NF.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.[2]

The structure of the base-ten system is uniform



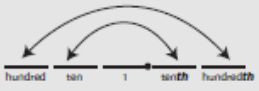
4.NF.4b Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

b Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number.

4.NF.6 Use decimal notation for fractions with denominators 10 or 100.

4.NF.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

Symmetry with respect to the ones place



Source: http://commoncoretools.files.wordpress.com/2011/04/ccss_progression_nbt_2011_04_073.pdf

BOCES Tompkins Seneca Tioga BOCES
An Educational Plus

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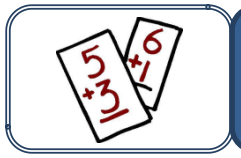
Rigor - Fluency

Focus strongly where the standards focus.

Think across grades and link to major topics within grades.



Students practice core functions so that they are more able to understand and manipulate complex concepts.

Fluency

- Speed and accuracy
  - Learn about related topics in a way that reinforces the core learning
  - A constant effort to rethink what we learn in math, so it links to core understanding

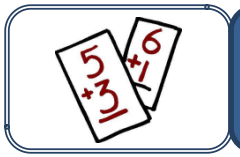
Grade	Required Fluency
K	Add/subtract within 5
1	Add/subtract within 10
2	Add/subtract within 20[1] Add/subtract within 100 (pencil and paper)
3	Multiply/divide within 100[2] Add/subtract within 1000
4	Add/subtract within 1,000,000
5	Multi-digit multiplication
6	Multi-digit division Multi-digit decimal operations
7	Solve $px + q = r$, $p(x + q) = r$
8	Solve simple 2×2 systems by inspection

Source: http://engageny.org/wp-content/uploads/2011/07/CCSSFluencies.pdf

Rigor – Deep Understanding

Focus strongly where the standards focus.

Think across grades and link to major topics within grades.



Students practice core functions so that they are more able to understand and manipulate complex concepts.

Teach more than how to get the answer and support students to access concepts from multiple perspectives.

Deep Understanding

Fact:
Hong Kong only covers 50% of topics on the TIMSS assessments. We cover 100%.

- Flexible mastery of a small number of topics which can be applied to a variety of problems
- The price of fewer is deeper

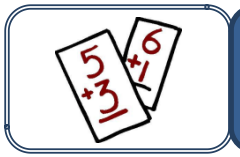
Source: http://www.ccsso.org/Resources/Digital_Resources/CCSS_for_Math_Shifts_and_Implications_for_Instruction.html
http://www.air.org/files/AIR_Measuring_Up_Report_0427091.pdf

Sitts, A. 2012. asitts@tstboces.org

Rigor – Application

Focus strongly where the standards focus.

Think across grades and link to major topics within grades.



Students practice core functions so that they are more able to understand and manipulate complex concepts.

Teach more than how to get the answer and support students to access concepts from multiple perspectives.

Students use appropriate concepts and procedures for application even when not prompted to do so.

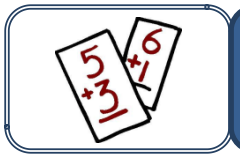
Application

- Capacity to apply learning in unique situations
- Provide opportunities at all grade levels for students to apply math concepts in “real world” situations

Rigor – Dual Intensity

Focus strongly where the standards focus.

Think across grades and link to major topics within grades.



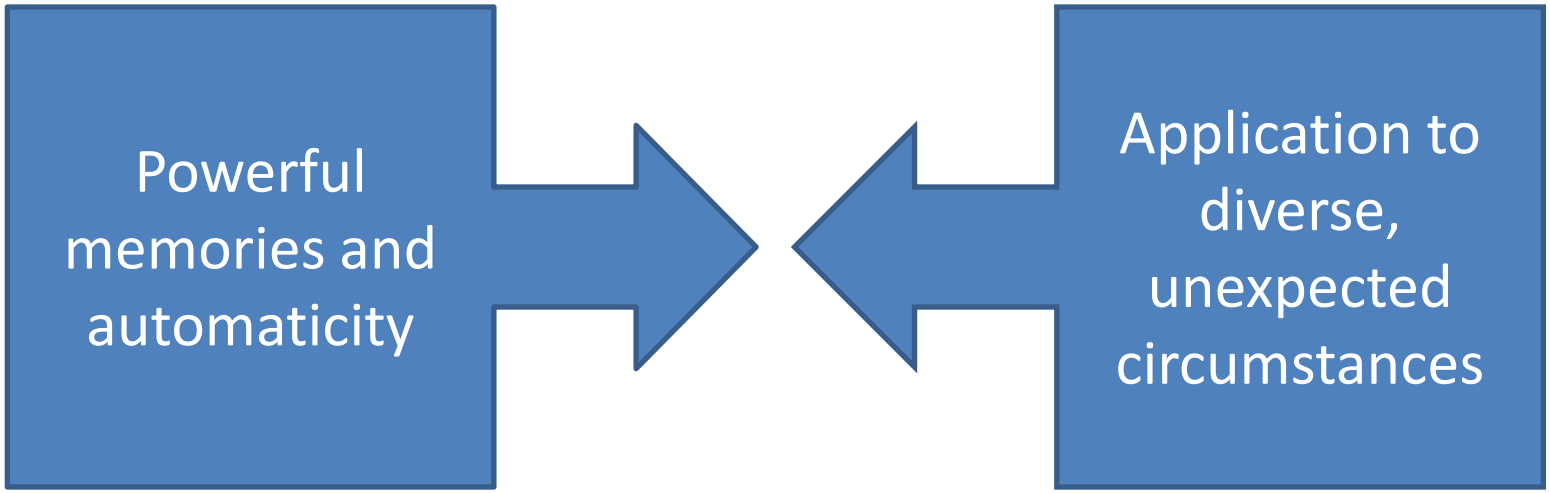
Students practice core functions so that they are more able to understand and manipulate complex concepts.

Teach more than how to get the answer and support students to access concepts from multiple perspectives.

Students use appropriate concepts and procedures for application even when not prompted to do so.

Equal intensity in conceptual understanding, procedural skill/fluency, and application.

Dual Intensity



Source: http://www.ccsso.org/Resources/Digital_Resources/CCSS_for_Math_Shifts_and_Implications_for_Instruction.html

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For More Information…

- www.tst-math.wikispaces.com
- www.EngageNY.org

Questions?

Image: http://venturebeat.com/2012/08/07/iphone-vs-galaxy-original-apple-icon-designer-susan-kare-confused-them/