The CCSS Requires Three Shifts in ELA/Literacy

1. **Building knowledge** through **content-rich nonfiction**
2. Reading, writing, and speaking grounded in **evidence from text**, both literary and informational
3. Regular practice with **complex text** and its **academic language**

ELA Shift #1: Content-Rich Nonfiction

Balance of literary to informational texts

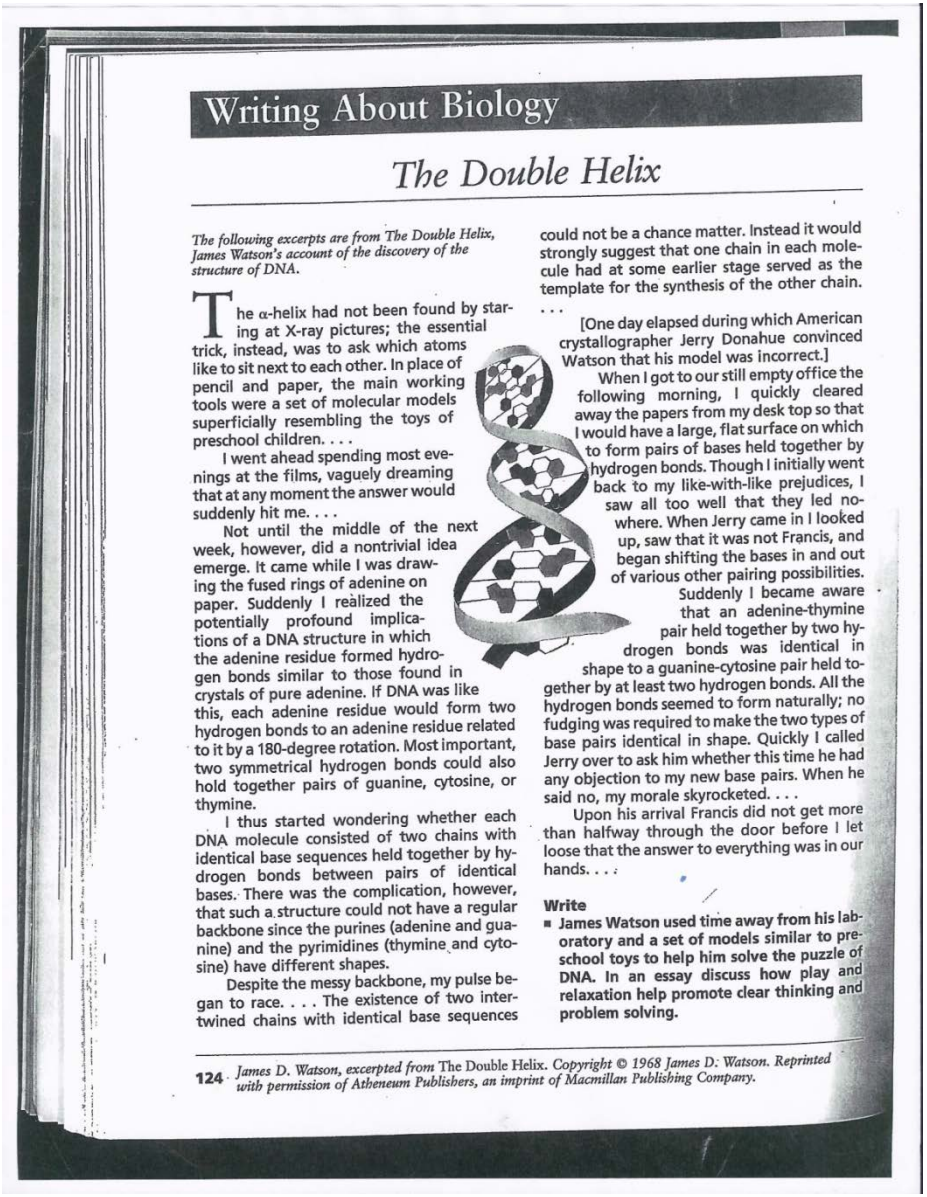
- 50/50 in K-5
- 45/55 in grades 6-8
- 70/30 in grades 9-12
- Beginning in grades 2, students read more complex texts, combining foundational skills with reading comprehension.
- Reading aloud texts that are well-above grade level are used K-5 and beyond to build vocabulary and background knowledge.

ELA Shift #2: Using Text Evidence

- Most college and workplace writing requires evidence.
- Ability to cite evidence differentiates strong from weak student performance on NAEP
- Evidence is a major emphasis of the ELA Standards:
    - Reading Standard 1
    - Writing Standard 9
    - Speaking and Listening Standards 2, 3, and 4

Non-Examples and Examples

Not Text-Dependent	Text-Dependent
In "Casey at the Bat," Casey strikes out. Describe a time when you failed at something.	What makes Casey's experiences at bat humorous?
In "Letter from a Birmingham Jail," Dr. King discusses nonviolent protest. Discuss, in writing, a time when you wanted to fight against something that you felt was unfair.	What can you infer from King's letter about the letter that he received?
In "The Gettysburg Address" Lincoln says the nation is dedicated to the proposition that all men are created equal. Why is equality an important value to promote?	"The Gettysburg Address" mentions the year 1776. According to Lincoln's speech, why is this year significant to the events described in the speech?



Writing About Biology

The Double Helix

The following excerpts are from The Double Helix, James Watson's account of the discovery of the structure of DNA.

The α-helix had not been found by staring at X-ray pictures; the essential trick, instead, was to ask which atoms like to sit next to each other. In place of pencil and paper, the main working tools were a set of molecular models superficially resembling the toys of preschool children. . . .

I went ahead spending most evenings at the films, vaguely dreaming that at any moment the answer would suddenly hit me. . . .

Not until the middle of the next week, however, did a nontrivial idea emerge. It came while I was drawing the fused rings of adenine on paper. Suddenly I realized the potentially profound implications of a DNA structure in which the adenine residue formed hydrogen bonds similar to those found in crystals of pure adenine. If DNA was like this, each adenine residue would form two hydrogen bonds to an adenine residue related to it by a 180-degree rotation. Most important, two symmetrical hydrogen bonds could also hold together pairs of guanine, cytosine, or thymine.

I thus started wondering whether each DNA molecule consisted of two chains with identical base sequences held together by hydrogen bonds between pairs of identical bases. There was the complication, however, that such a structure could not have a regular backbone since the purines (adenine and guanine) and the pyrimidines (thymine and cytosine) have different shapes.

Despite the messy backbone, my pulse began to race. . . . The existence of two intertwined chains with identical base sequences could not be a chance matter. Instead it would strongly suggest that one chain in each molecule had at some earlier stage served as the template for the synthesis of the other chain. . . .

[One day elapsed during which American crystallographer Jerry Donahue convinced Watson that his model was incorrect.]

When I got to our still empty office the following morning, I quickly cleared away the papers from my desk top so that I would have a large, flat surface on which to form pairs of bases held together by hydrogen bonds. Though I initially went back to my like-with-like prejudices, I saw all too well that they led nowhere. When Jerry came in I looked up, saw that it was not Francis, and began shifting the bases in and out of various other pairing possibilities. Suddenly I became aware that an adenine-thymine pair held together by two hydrogen bonds was identical in shape to a guanine-cytosine pair held together by at least two hydrogen bonds. All the hydrogen bonds seemed to form naturally; no fudging was required to make the two types of base pairs identical in shape. Quickly I called Jerry over to ask him whether this time he had any objection to my new base pairs. When he said no, my morale skyrocketed. . . .

Upon his arrival Francis did not get more than halfway through the door before I let loose that the answer to everything was in our hands. . . .

Write

- **James Watson used time away from his laboratory and a set of models similar to preschool toys to help him solve the puzzle of DNA. In an essay discuss how play and relaxation help promote clear thinking and problem solving.**

124 *James D. Watson, excerpted from* The Double Helix. *Copyright © 1968 James D. Watson. Reprinted with permission of Atheneum Publishers, an imprint of Macmillan Publishing Company.*

Example?

James Watson used time away from his laboratory and a set of models similar to preschool toys to help him solve the puzzle of DNA. In an essay discuss how play and relaxation help promote clear thinking and problem solving.

CCSS Informational Text Assessment Question:

High school students read an excerpt of James D. Watson's *The Double Helix* and respond to the following:

> *What mistakes did Watson make along the way to his discovery? What was his response to this mistake?*

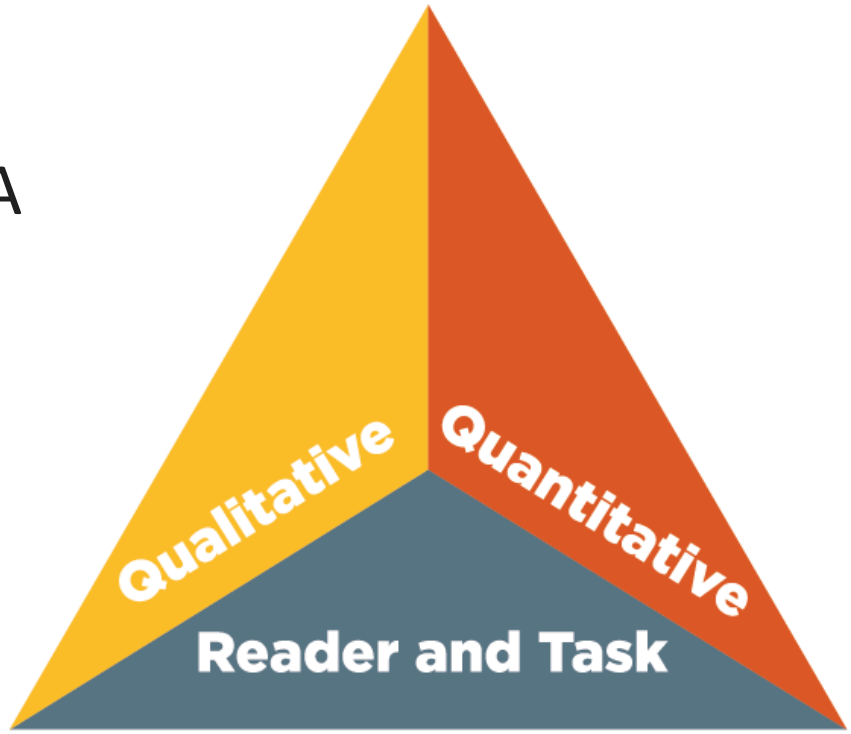
ELA Shift #3: Complex Text & Academic Language

- There is a 4 year gap in the complexity of what students read by the end of high school and college .
- What students can read, in terms of complexity is the greatest predictor of success in college (ACT study).
- <50% of graduates can read sufficiently complex texts.
- Standards focus on building academic vocabulary to improve comprehension.
- Standards include a staircase of text complexity from elementary through high school.

Text Complexity

- Appendix A
- Supplement to Appendix A
- Appendix B

CCSS address *what* and *how* students read.



Which text is more complex?

Text 1

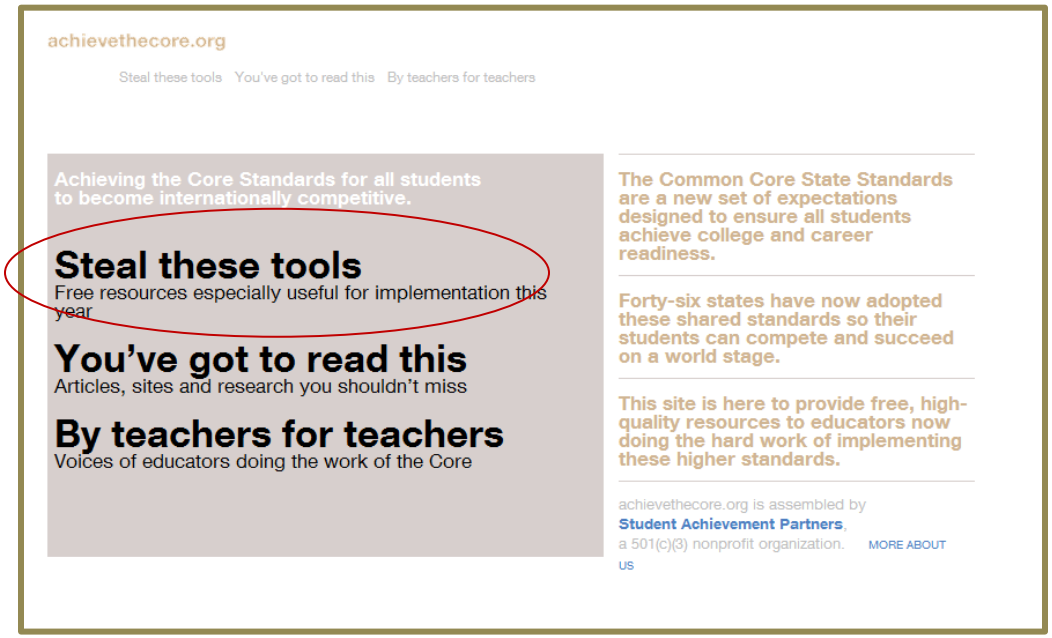
Lincoln was shaken by the presidency. Back in Springfield, politics had been a sort of exhilarating game; but in the White House, politics was power, and power was responsibility. Never before had Lincoln held executive office. In public life he had always been an insignificant legislator whose votes were cast in concert with others and whose decisions in themselves had neither finality nor importance. As President he might consult with others, but innumerable grave decisions were in the end his own, and with them came a burden of responsibility terrifying in its dimensions.

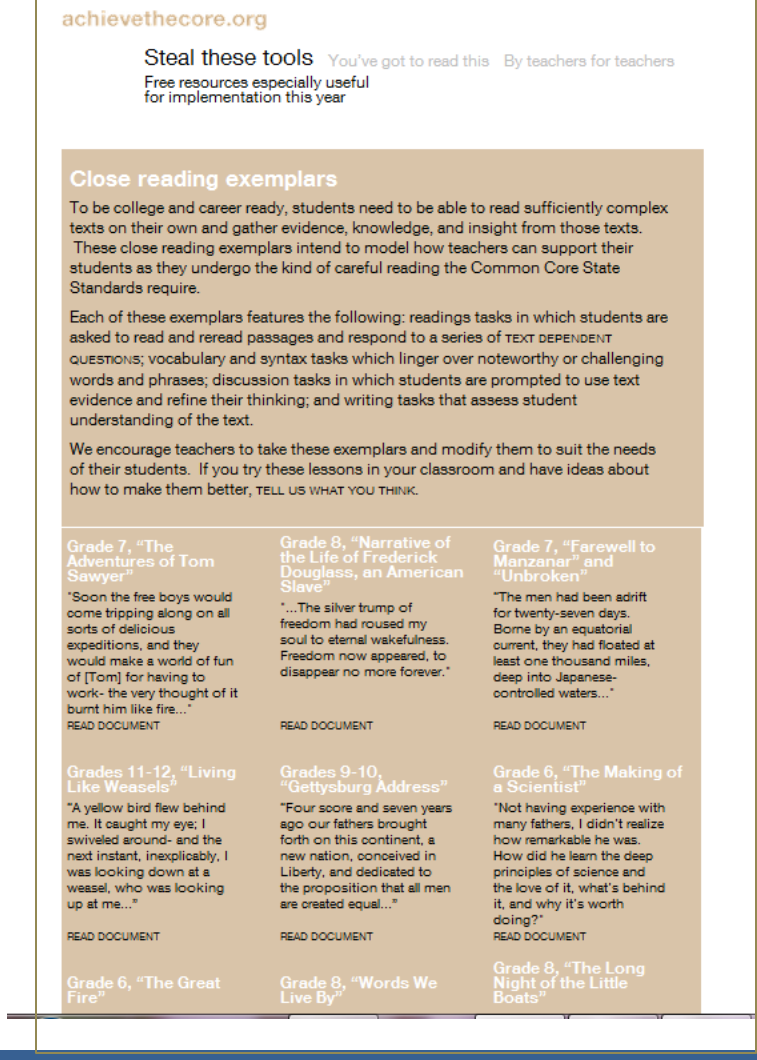
Text 2

According to those who knew him, Lincoln was a man of many faces. In repose, he often seemed sad and gloomy. But when he began to speak, his expression changed. "The dull, listless features dropped like a mask," said a Chicago newspaperman. "The eyes began to sparkle, the mouth to smile, the whole countenance was wreathed in animation, so that a stranger would have said, 'Why, this man, so angular and solemn a moment ago, is really handsome.' "

What are the Qualitative Features of Complex Text?

- Subtle and/or frequent transitions
- Multiple and/or subtle themes and purposes
- Density of information
- Unfamiliar settings, topics or events
- Lack of repetition, overlap or similarity in words and sentences
- Complex sentences
- Uncommon vocabulary
- Lack of words, sentences or paragraphs that review or pull things together for the student
- Longer paragraphs
- Any text structure which is less narrative and/or mixes structures



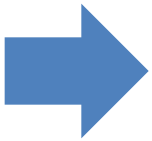


www.achievethecore.org

How should the shifts influence practice?

From…

Content knowledge *primarily from teacher-led lecture*

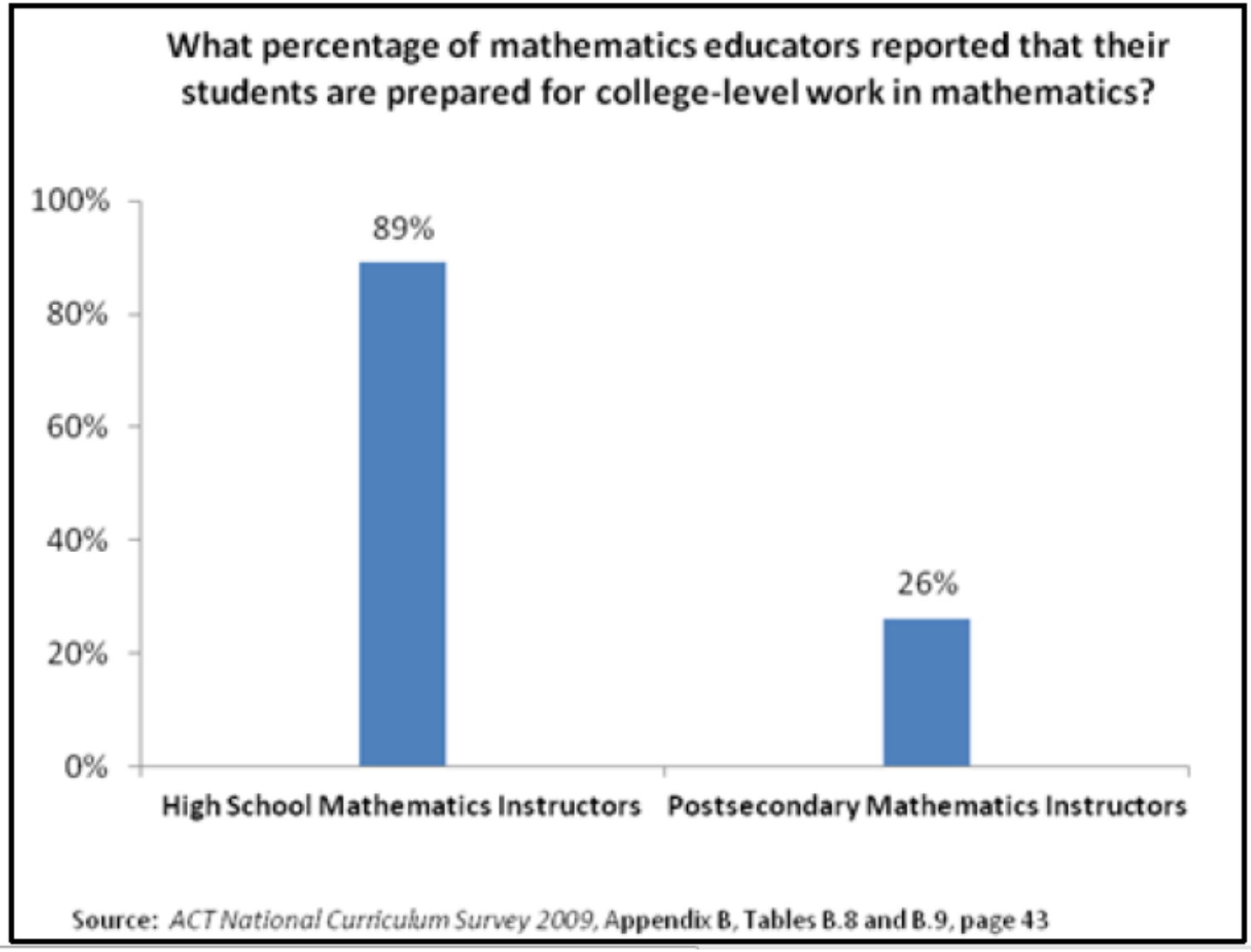


To…

Content knowledge comes from a *balance* of **reading**, **writing** lecture, and hands-on experience

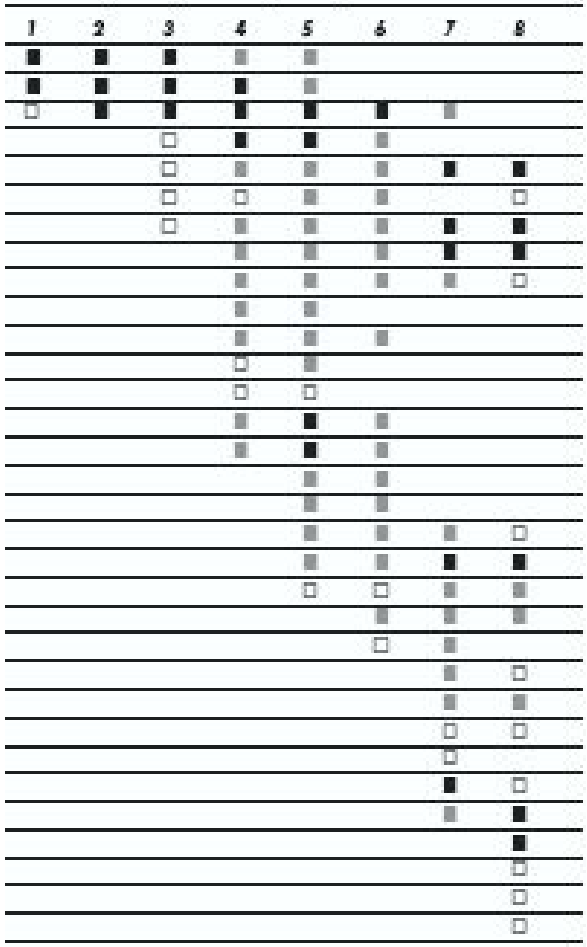
Introduction to the Math Shifts of the Common Core State Standards

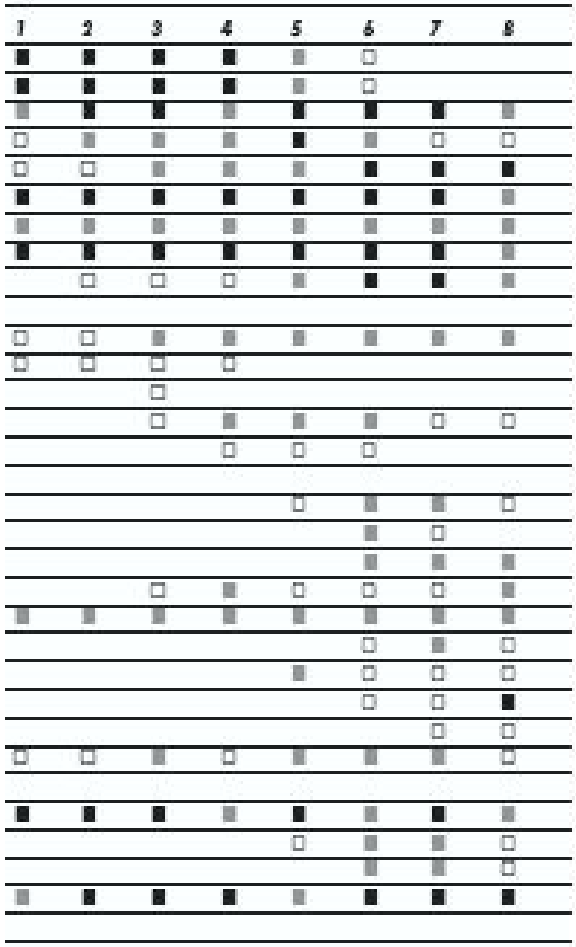
College Math Professors Feel HS students Today are Not Prepared for College Math



The shape of math in A+ countries

Mathematics topics intended at each grade by at least two-thirds of A+ countries





Mathematics topics intended at each grade by at least two-thirds of 21 U.S. states

[1] *Schmidt, Houang, & Cogan, "A Coherent Curriculum: The Case of Mathematics." (2002).*

Structure of the Standards

- **Domains** are large groups of related standards. Domains change from grade to grade to reflect the changing focus of each grade. Standards from different domains may sometimes be closely related.
- **Clusters** are groups of related standards. Each domain has 1 – 4 clusters. Standards from different clusters may sometimes be closely related.
- **Standards** define what students should understand and be able to do.

Identify the Standard

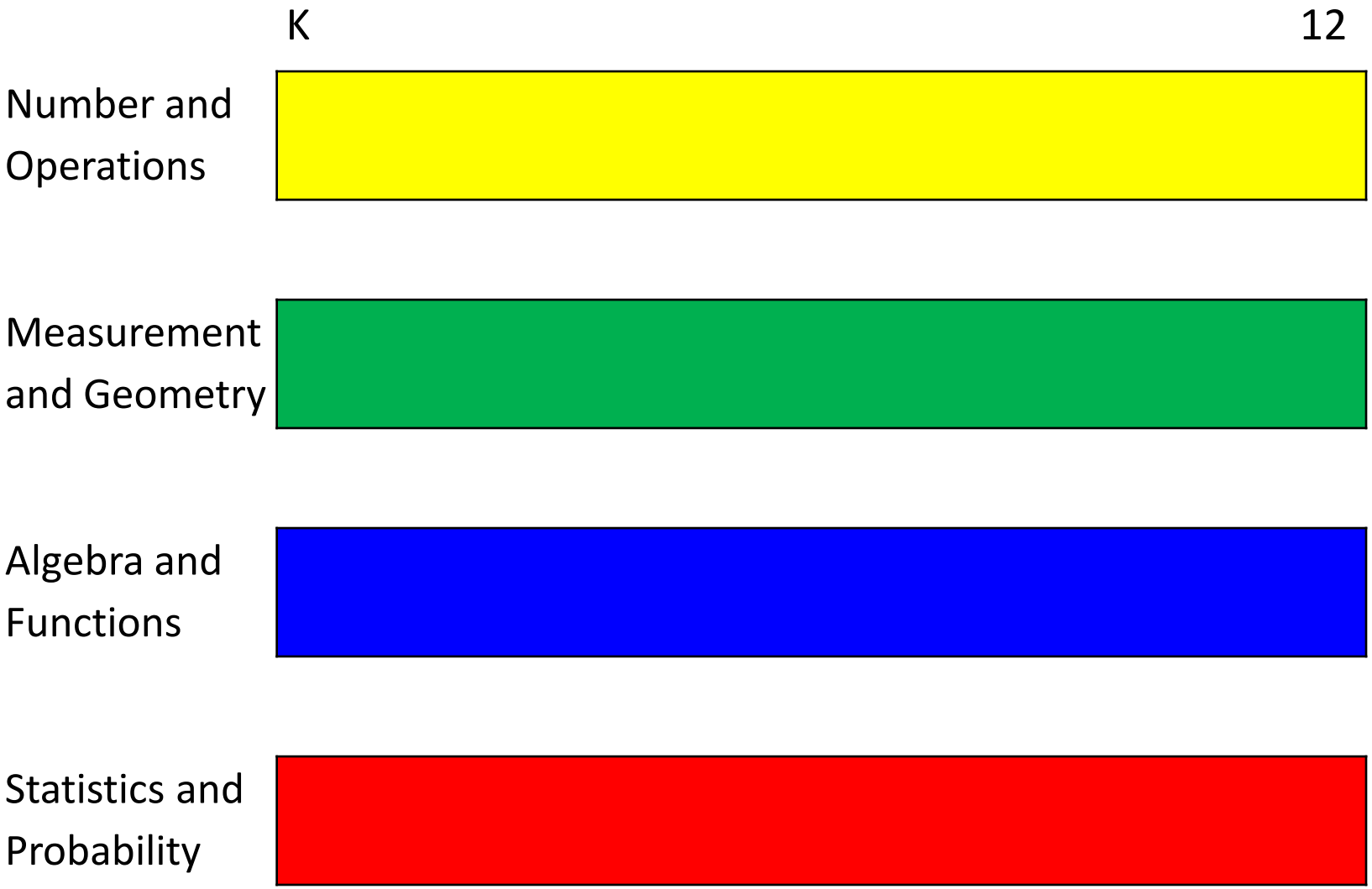
5.NBT.4

3.OA.C

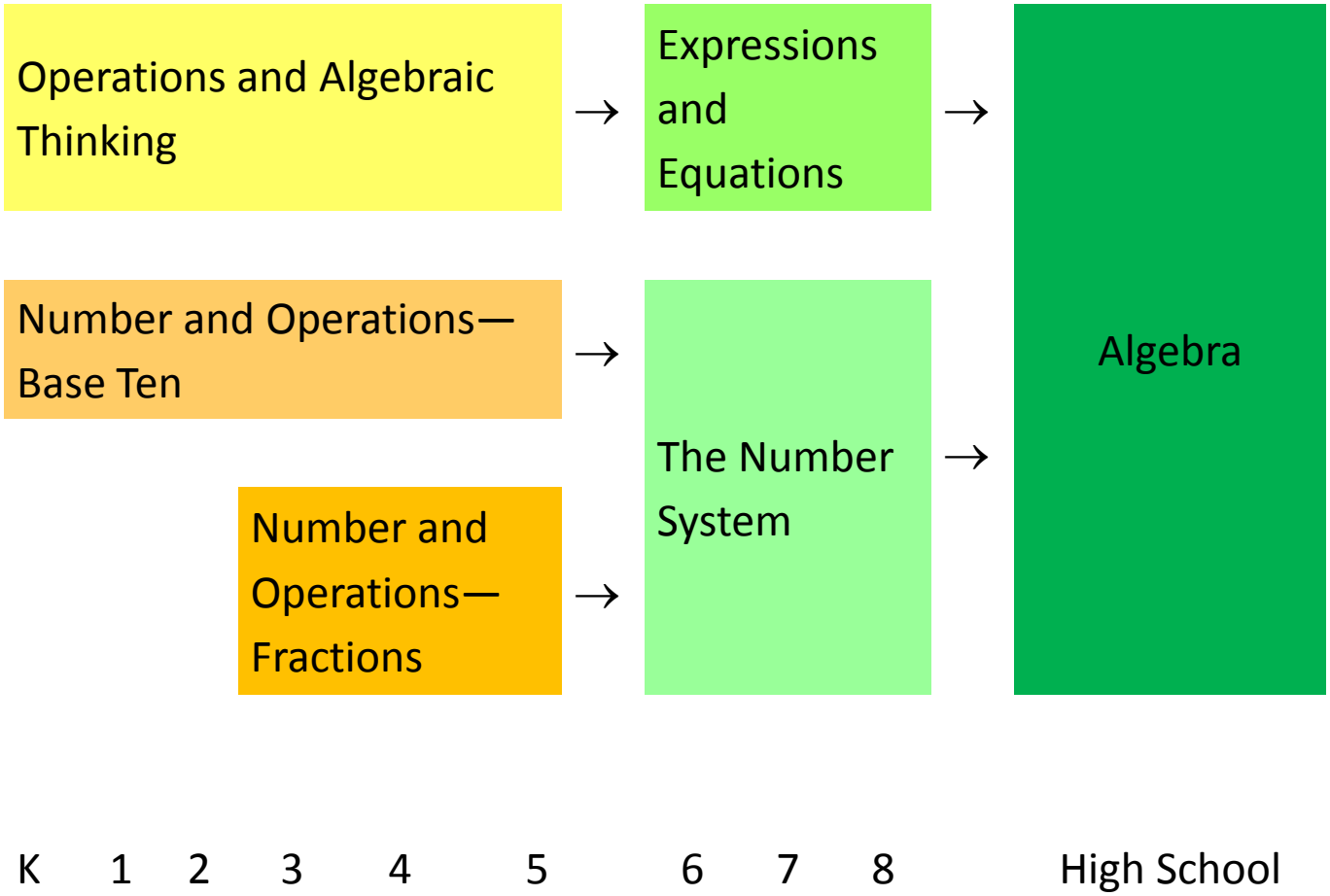
The CCSS Requires Three Shifts in Mathematics

1. **Focus** strongly where the standards focus.
2. **Coherence**: **Think** across grades, and **link** to major topics.
3. **Rigor:** In major topics, pursue **conceptual understanding,** procedural skill and **fluency**, and **application**.

Traditional U.S. Approach



Shift #1: Focus (within Number and Operations)



Priorities in Mathematics

Grade	Priorities in Support of Rich Instruction and Expectations of Fluency and Conceptual Understanding
K–2	Addition and subtraction, measurement using whole number quantities
3–5	Multiplication and division of whole numbers and fractions
6	Ratios and proportional reasoning; early expressions and equations
7	Ratios and proportional reasoning; arithmetic of rational numbers
8	Linear algebra/linear functions

Shift #2: Coherence

- Carefully connect the learning **within and across grades** so that students can build new understanding on foundations built in previous years.
- Each standard is not a new event, but an extension of previous learning.

"The Standards are not so much built from topics as they are woven out of progressions."

Structure is the Standards, Publishers' Criteria for Mathematics, Appendix

Coherence: Link to Major Topics Within Grades

Example: Data Representation

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

Standard
3.MD.3

Coherence: Link to Major Topics Across Grades

One of several staircases to algebra designed in the OA domain.

Expressions and Equations 6.EE

3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*

Operations and Algebraic Thinking 5.OA

2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*

Operations and Algebraic Thinking 3.OA

5. Apply properties of operations as strategies to multiply and divide.[2] *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.)*

Operations and Algebraic Thinking 1.OA

3. Apply properties of operations as strategies to add and subtract.[3] *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*

Shift #3: Rigor

- The CCSS require a balance of:
  - Solid conceptual understanding
  - Procedural skill and fluency
  - Application of skills in problem solving situations
- Pursuit of all three requires equal intensity in time, activities, and resources.

Shallow testing of place values concepts means that shallow teaching of them is rewarded.

Name: _____

Hundreds, Tens and Ones

a. 234 = _____ hundreds, _____ tens, _____ ones

b. 809 = _____ hundreds, _____ tens, _____ ones

c. 571 = _____ hundreds, _____ tens, _____ ones

d. 160 = _____ hundreds, _____ tens, _____ ones

e. 67 = _____ hundreds, _____ tens, _____ ones

f. _____ = 3 hundreds, 4 tens, 8 ones

g. _____ = 6 hundreds, 0 tens, 2 ones

h. _____ = 0 hundreds, 0 tens, 5 ones

i. _____ = 0 hundreds, 7 tens, 0 ones

j. _____ = 9 hundreds, 9 tens, 9 ones

5) 3 hundreds _____

6) 106 = 1 hundred + _____tens + _____ones

7) 106 = _____tens + _____ones

8) 106 = _____ones

9) 90 + 300 + 4 = _____

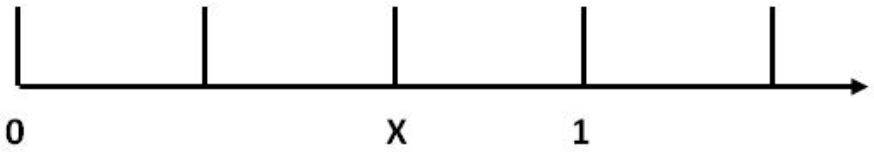
Are these comparisons true or false?

10) 2 hundreds + 3 ones > 5 tens + 9 ones

11) 9 tens + 2 hundreds + 4 ones < 924

Unit Assessment

Grade 3 sample formative assessment items

Code #	CCSS and/or NJCCCS	
3.NF.1	Understand a fraction **1**/***b*** as the quantity formed by **1** part when a whole is partitioned into ***b*** equal parts; understand a fraction ***a***/***b*** as the quantity formed by ***a*** parts of size **1**/***b***.	
#	**STUDENT LEARNING OBJECTIVES**	**CORRESPONDING CCSS/NJCCCS**
3	Identify unit fractions and fractions composed of unit fractions on the number line.	**3.NF.1**
VOCABULARY		
Partitioning, Unknown, Equation, Multiple, Properties of Operations, Arrays		
ASSESSMENT		
Sample SLO #3	Find the fraction numeral which names the location X.  a. $\frac{2}{4}$ b. $\frac{2}{3}$ c. $\frac{1}{2}$ d. $\frac{3}{4}$	
Sample SLO #3	Bob, Jasmine, Margo, Tim and Elijah were a team. Only Bob and Margo were bused to school. What part of the team did not arrive by bus? **A.** 2/3 **B.** 3/5 **C.** 2/5 **D.** 1/2	

Fluency

- The standards require speed and accuracy in calculation.
- Teachers structure class time and/or homework time for students to practice core functions such as single-digit multiplication so that they are more able to understand and manipulate more complex concepts

Required Fluencies in K-6

Grade	Standard	Required Fluency
K	K.OA.5	Add/subtract within 5
1	1.OA.6	Add/subtract within 10
2	2.OA.2 2.NBT.5	Add/subtract within 20 (know single-digit sums from memory) Add/subtract within 100
3	3.OA.7 3.NBT.2	Multiply/divide within 100 (know single-digit products from memory) Add/subtract within 1000
4	4.NBT.4	Add/subtract within 1,000,000
5	5.NBT.5	Multi-digit multiplication
6	6.NS.2,3	Multi-digit division Multi-digit decimal operations

Application

- Students can use appropriate concepts and procedures for application even when not prompted to do so.
- Teachers provide opportunities at all grade levels for students to apply math concepts in "real world" situations, recognizing this means different things in K-5, 6-8, and HS.
- Teachers in content areas outside of math, particularly science, ensure that students are using grade-level-appropriate math to make meaning of and access science content.