COMMON CORE: THE IMPACT ON HIGHER EDUCATION

Michael Fisher – Digigogy.com

COMMON CORE

STATE STANDARDS INITIATIVE

PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

Highlights and Implications

What is the Common Core State Standards Initiative?

The Common Core State Standards Initiative is a state-led effort that established a single set of clear educational standards for kindergarten through 12th grade in English language arts and mathematics that states voluntarily adopt. The standards are designed to ensure that students graduating from high school are prepared to enter credit bearing entry courses in two or four year college programs or enter the workforce. The standards are clear and concise to ensure that parents, teachers, and students have a clear understanding of the expectations in reading, writing, speaking and listening, language and mathematics in school.

Source: corestandards.org

Mission: College and Career Readiness

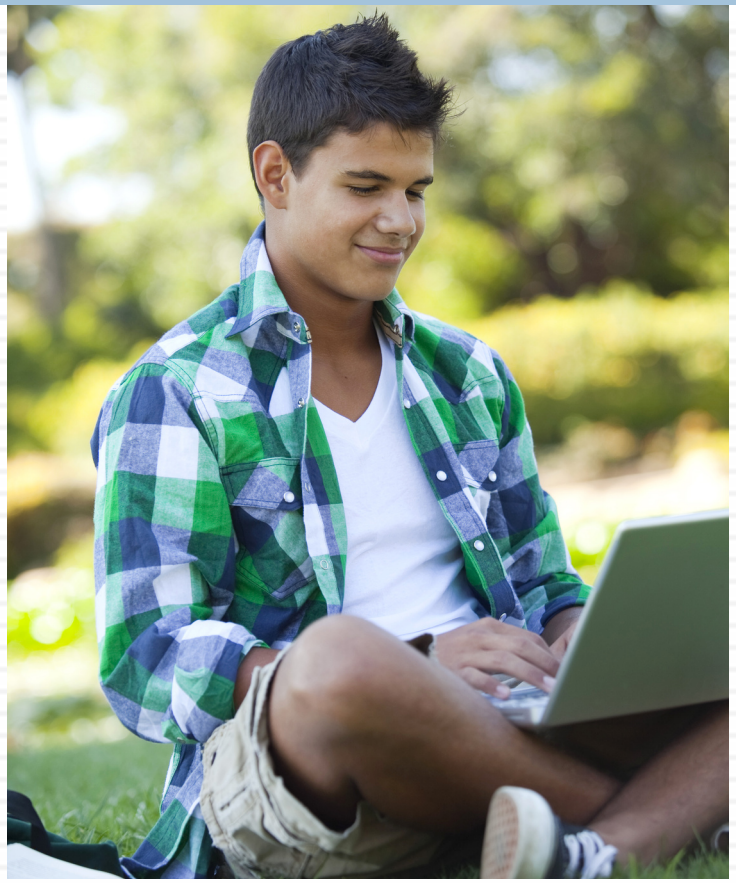
The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy.

Source: Corestandards.org

Why does this matter?

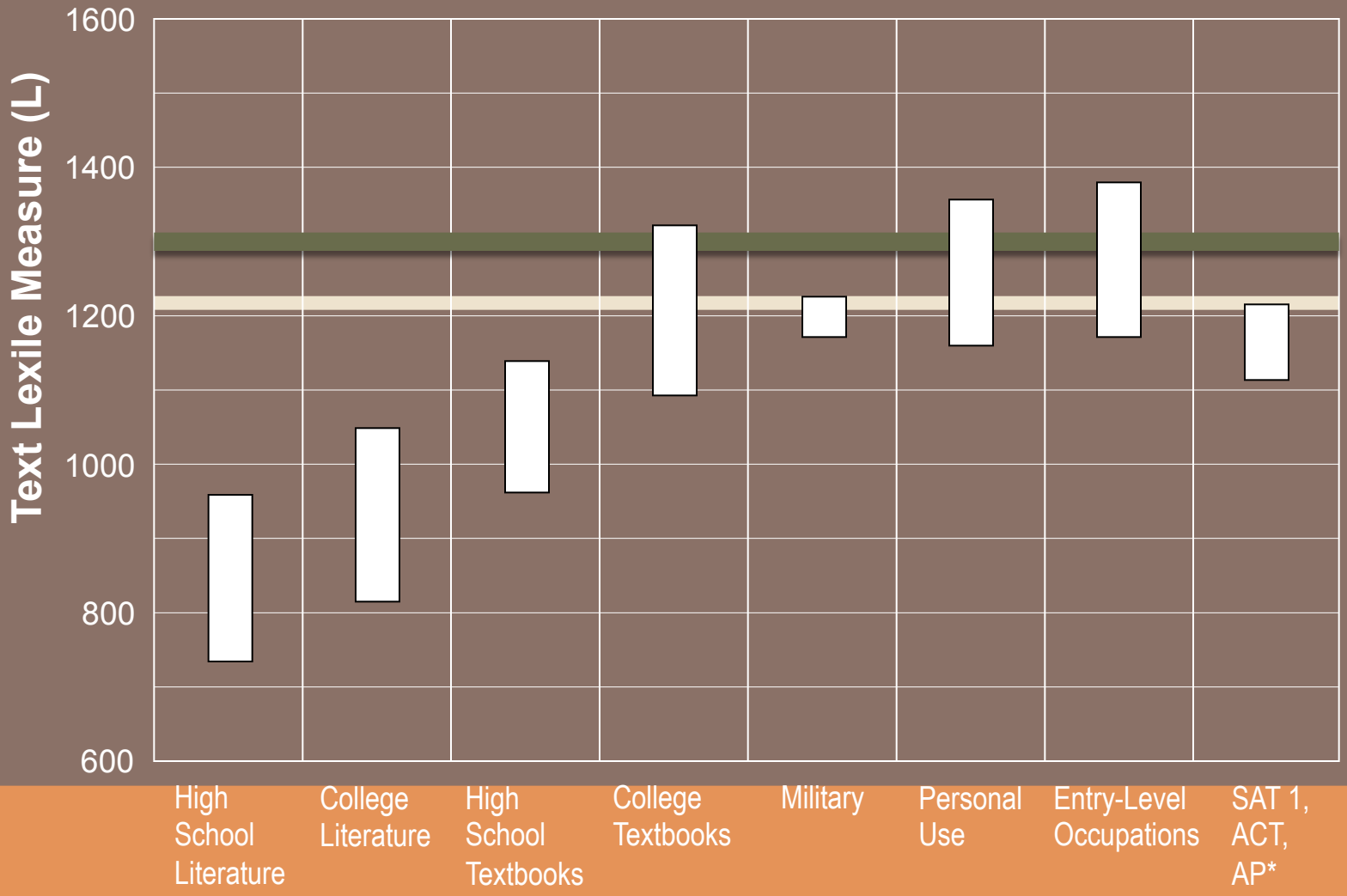
- Remediation for a large percentage of students entering college for the first time.
- Gaps in instruction
- Not ready for college or careers
- Dropout likelihood after entering college

Who are we teaching?



Let's take a look at ELA/Literacy

LEXILE FRAMEWORK® FOR READING STUDY
SUMMARY OF TEXT LEXILE MEASURES



* Source of National Test Data: MetaMetrics

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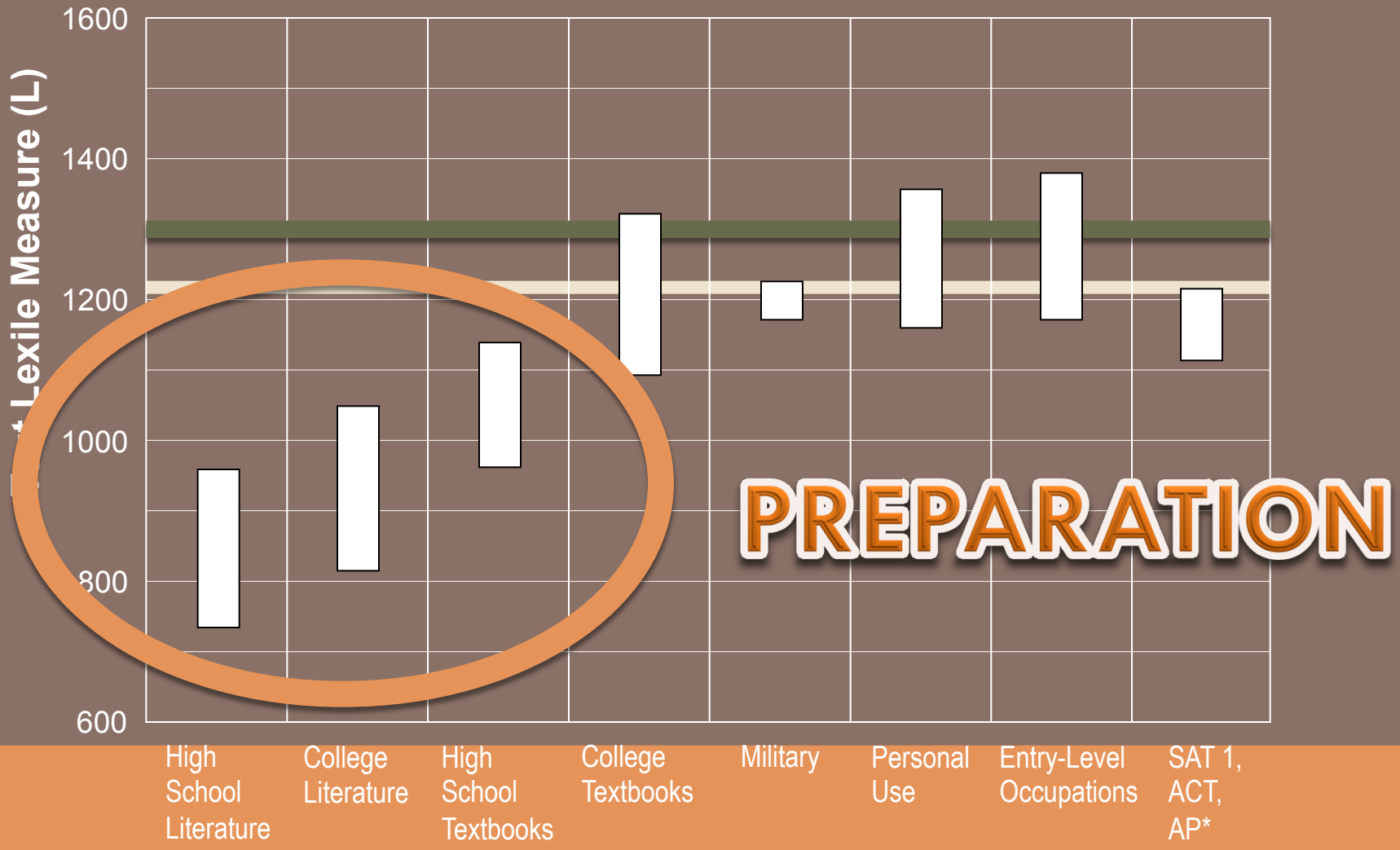

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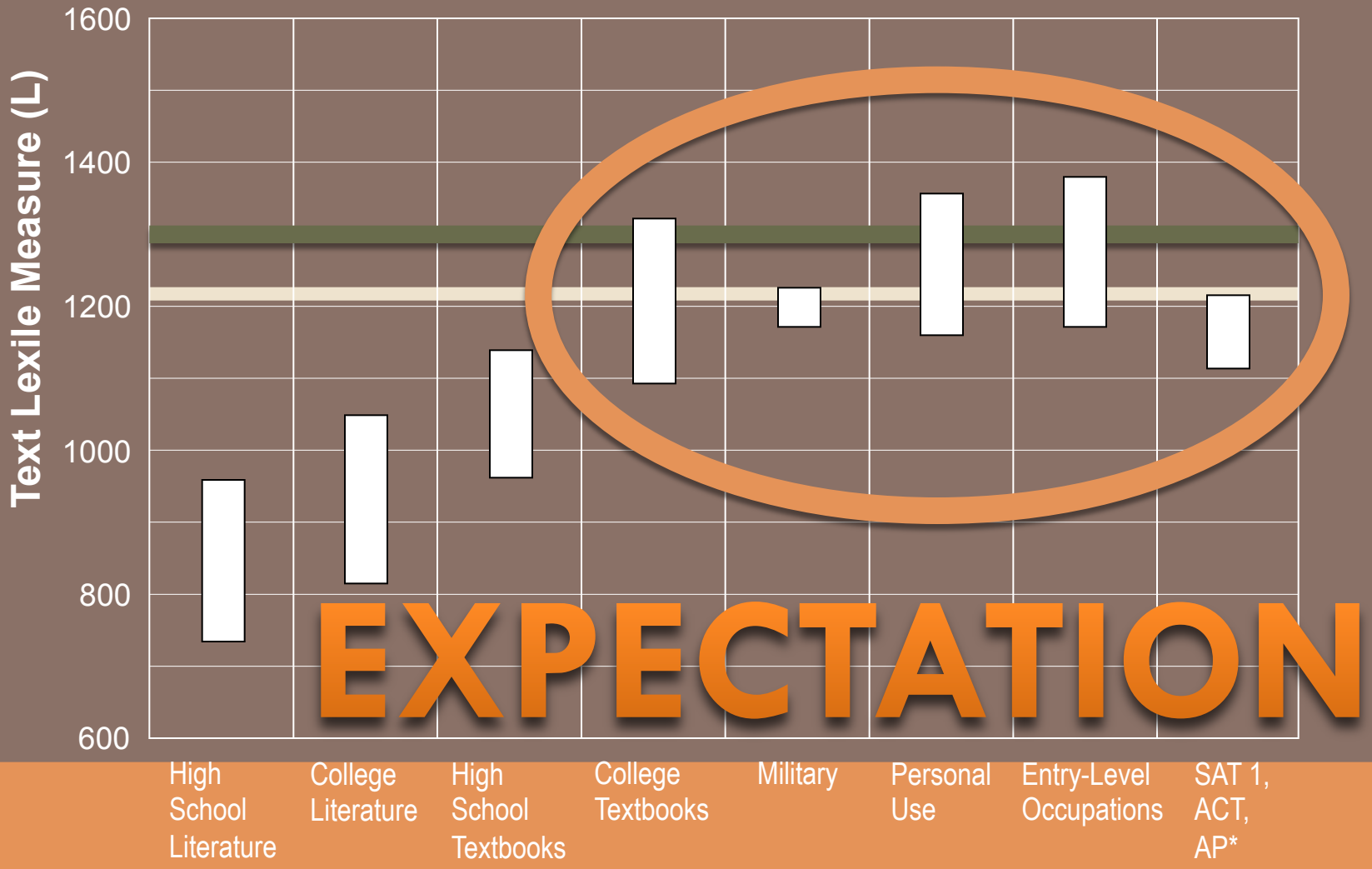

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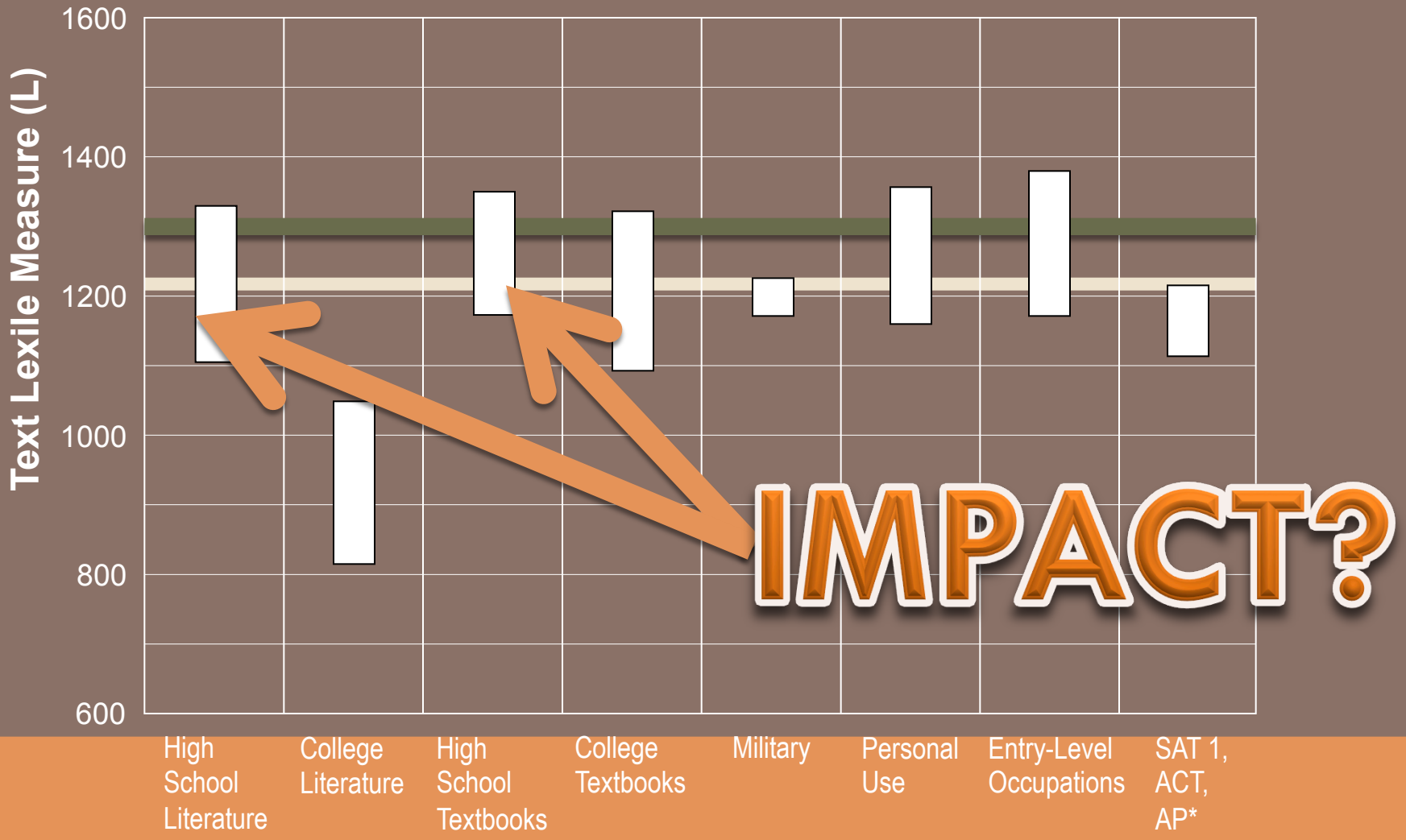


* Source of National Test Data: MetaMetrics

College and Career Readiness Capacities

1. Students demonstrate independence.
2. Students build strong content knowledge.
3. Students respond to the varying demands of audience, task, purpose, and discipline.
4. Students comprehend as well as critique.
5. Students value evidence.
6. Students use technology and digital media strategically and capably.
7. Students come to understand other cultures and perspectives.

College and Career Readiness Capacities: Implications for Higher Education

1. Students demonstrate independence. – Demonstration of independence through content knowledge means that learning is a construct of analytical thinking and students need to demonstrate, independently, that level of analysis.
2. Students build strong content knowledge. – Content knowledge is still important, though beyond just the comprehension level. “Build” is the strong verb here.

College and Career Readiness Capacities: Implications for Higher Education

3 Students respond to the varying demands of audience, task, purpose, and discipline. – Students engage with multiple audiences for the sake of authentic experiences within integrated disciplines.

4 Students comprehend as well as critique. – Students not only understand what they are reading beyond a rote level, they critically analyze for plausibility and ask evaluative questions.

5 Students value evidence. – Students speak and write from evidence. They look for evidence in claims.

College and Career Readiness Capacities: Implications for Higher Education

6. Students use technology and digital media strategically and capably. – This one is relative to the schools they come from, but students should have multiple tools in their toolboxes and know which tool to use in a task-dependent way.
7. Students come to understand other cultures and perspectives. – This is all about learning to collaborate and communicate with multiple cultures and perspectives, an extremely important skill in the modern workplace and modern collegiate pursuits.

College and Career Readiness Capacities: Implications for Higher Education

Checkpoint:

What are some ways college level instructors can embrace these Readiness Capacities in their course design and instructional practice?

Instructional Shifts

- CoreUpgrades.weebly.com
- Navigate to document and let's talk about collegiate implications.
- Purpose: How do these roles change in college?

Instructional Shifts

- **Shift 1: Balancing Informational and Literary Text**
- Collegiate Role:
  - Because of the specificity in college and the concentration in a particular content area, this shift could potentially be more about "informating," where access to multiple types of information/ media impact the learning rather than specifically scaffolded informational text supports for increasing comprehension of literary anchor texts.

Instructional Shifts

- **Shift 2: Knowledge in the Disciplines**
- Collegiate Role:
  - This shift is college ready. Discipline specific content is the focus and students would be expected to move beyond proficiency and into the mastery zone in the discipline. This may include different roles for the teacher and the student in terms of demonstrating mastery versus demonstrating understanding.

Instructional Shifts

- **Shift 3: Staircase of Complexity**
- Collegiate Role:
  - Have a deep understanding of what factors impact the complexity of the text.
  - Texts in a course are of an increasing complexity.
  - Tasks related to texts in a course are more sophisticated over time.

Instructional Shifts

- **Shift 4: Text Based Answers**
- Collegiate Role:
  - Students should continue this metacognitive practice in college. Extensions should come from experience with multiple texts (see Shift 5) and students should be extending their thinking which may be rooted in the evidence but conclusions are based on both evidence and extensions/experience.

Instructional Shifts

- **Shift 5: Writing From Sources**
- Collegiate Role:
  - Students need access to multiple texts / multiple types of media to both draw conclusions and construct new knowledge from the consideration of multiple perspectives.
  - In college, students need to appropriately use multiple texts to support research claims/problems, cite those sources in the proper way, and use amplification techniques to revise/edit their work.

Instructional Shifts

- **Shift 6: Academic Vocabulary**
- Collegiate Role:
  - Just like in K-12 schools, vocabulary should be contextual, authentic, and embedded into instructional practice.
  - College professors still need to address vocabulary as a process rather than the rote recitation of terms.

Instructional Shifts

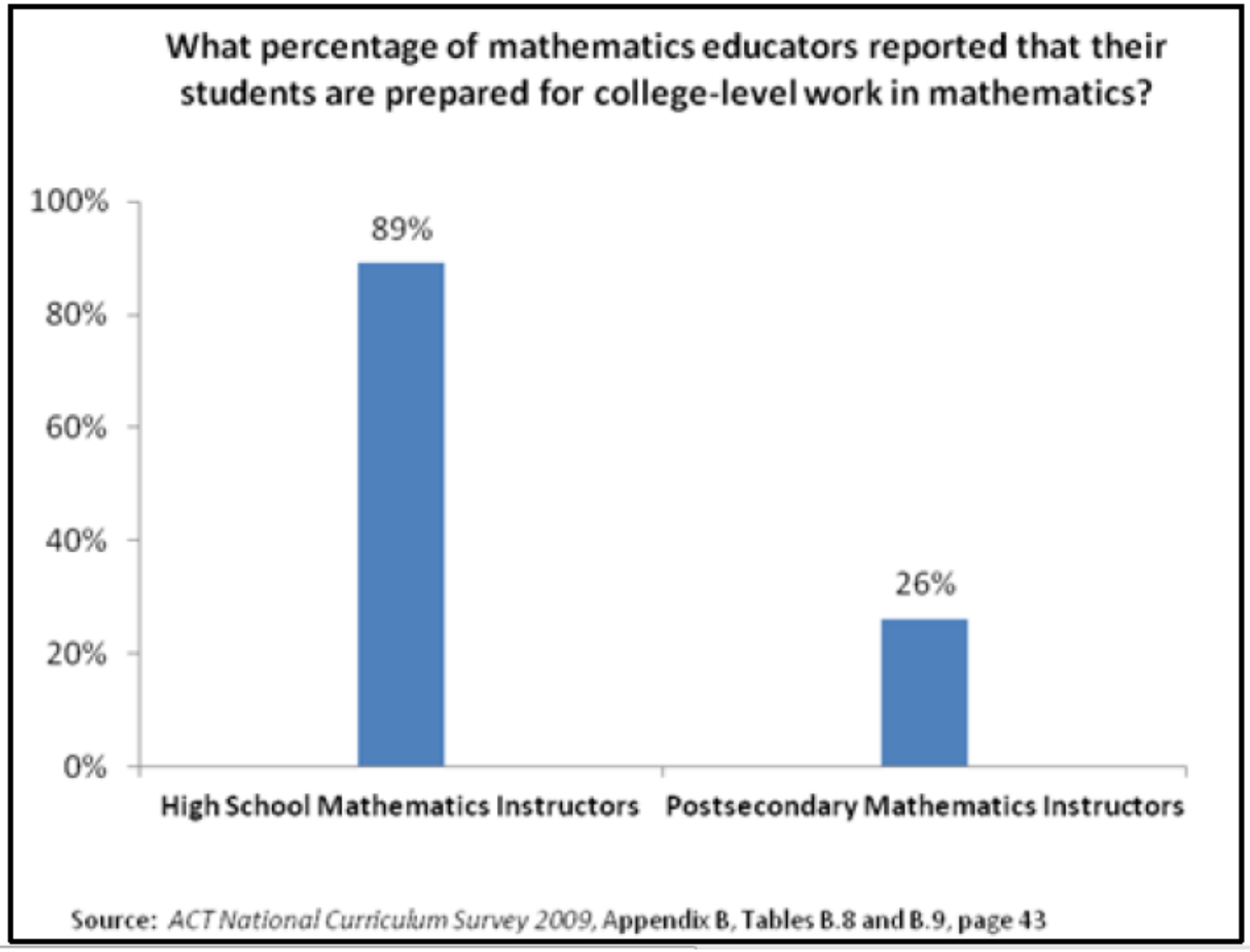
Checkpoint:

What have you heard me say so far that needs to be a priority for engaging these shifts in collegiate instructional practice?

Let's take a look at Math

- CoreUpgrades.weebly.com
- Navigate to document and let's talk about collegiate implications.
- Math section is from Achievethecore.org

Source: AchieveTheCore.org



Source: AchieveTheCore.org

What the disconnect means for students.

- Nationwide, many students in two-year and four-year colleges need remediation in math.
- Remedial classes lower the odds of finishing the degree or program.
- We need to set the agenda in high school math to prepare more students for postsecondary education and training.

Source: AchieveTheCore.org

The CCSS Requires Three Shifts in Mathematics

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

Shift #1: FOCUS

Focus Strongly where the Standards Focus

- Significantly narrow the scope of content and deepen how time and energy is spent in the math classroom.
- Focus deeply on what is emphasized in the standards, so that students gain strong foundations.
- Math Emphases document is available on EngageNY

Focus

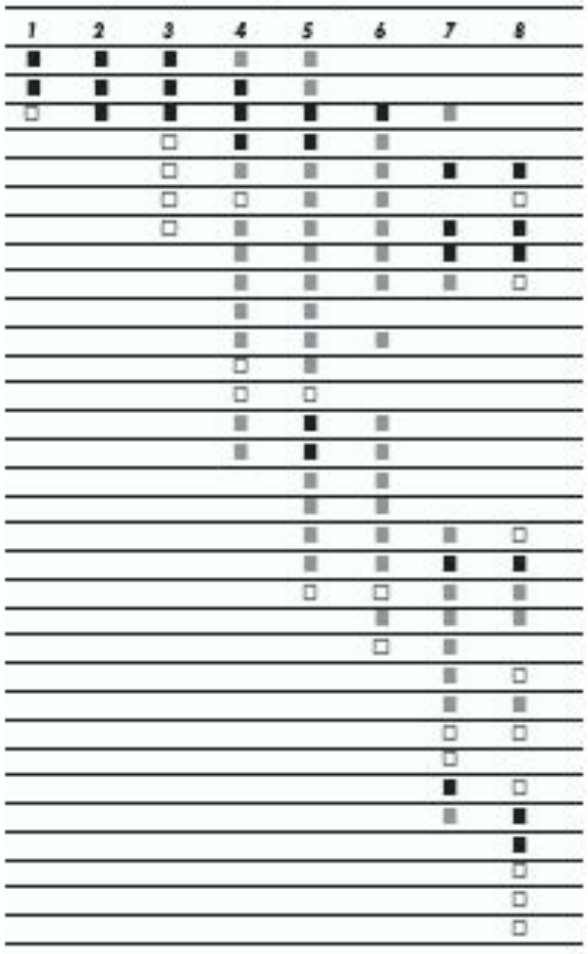
- Move away from **"mile wide, inch deep"** curricula identified in TIMSS.
- Learn from international comparisons.
- Teach less, learn more.

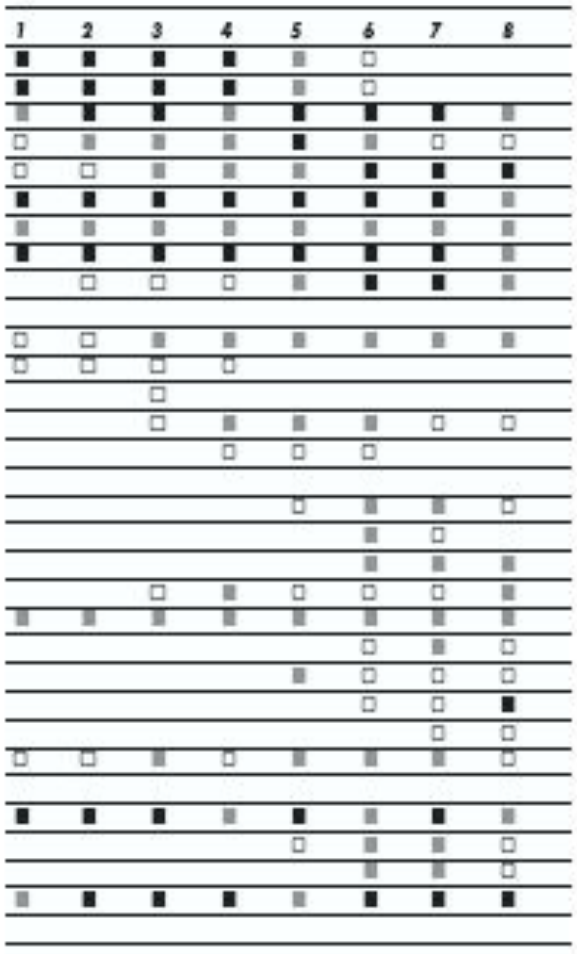
"Less topic coverage can be associated with higher scores on those topics covered because students have more time to master the content that is taught."

– Ginsburg et al., 2005

The shape of math in A+ countries

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

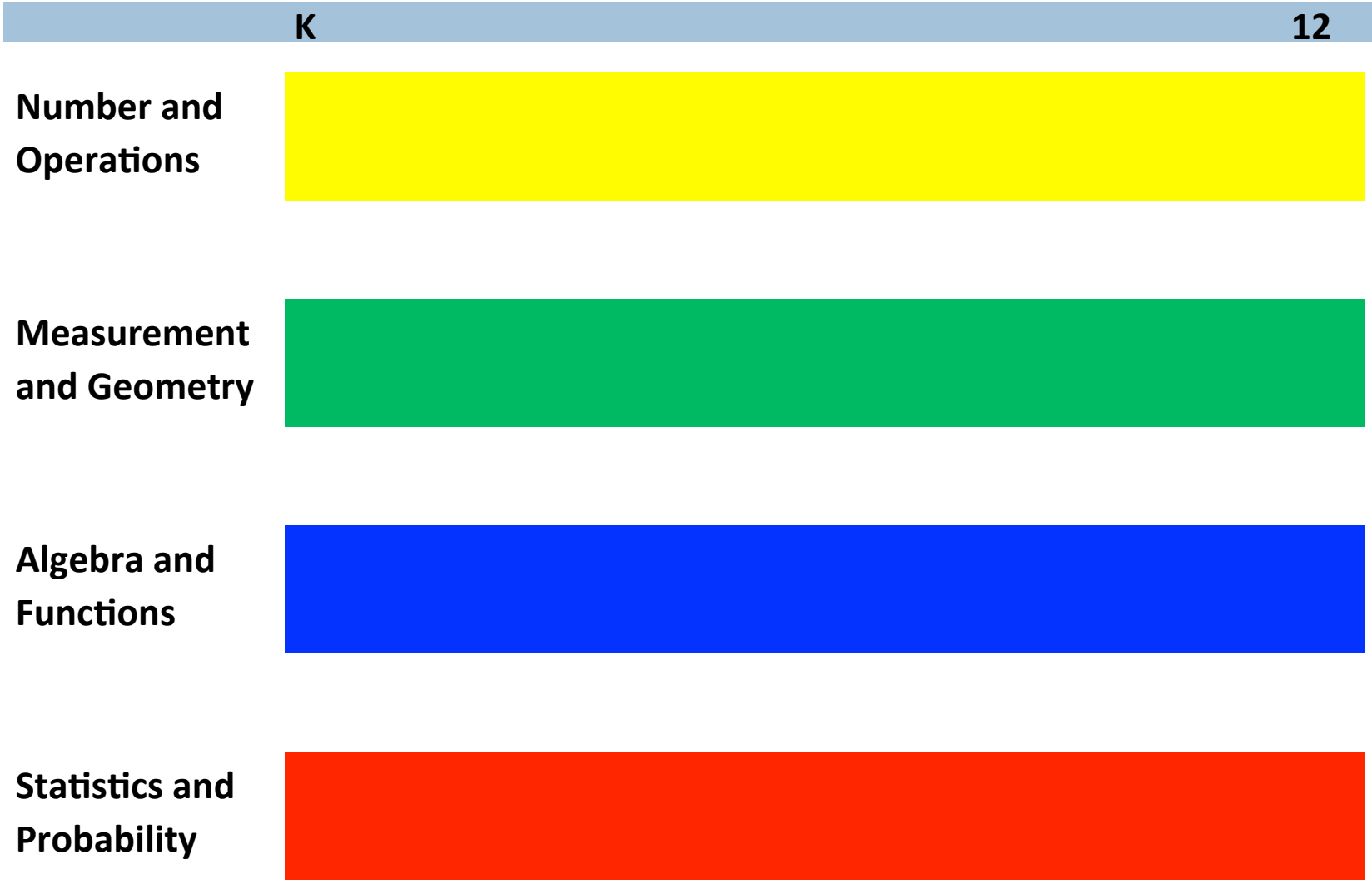




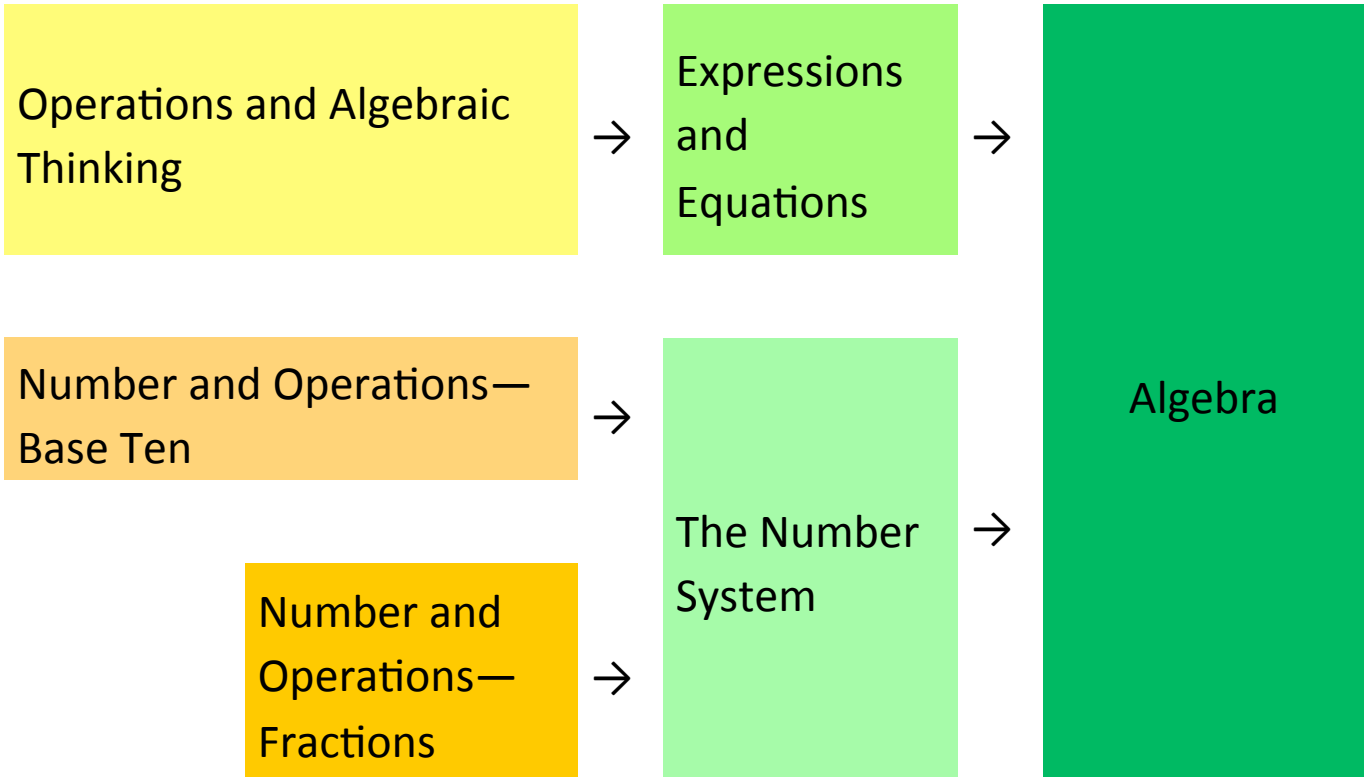
Mathematics topics intended at each grade by at least two-thirds of 21 U.S. states

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

Traditional U.S. Approach



Focusing Attention Within Number and Operations



Shift #2: Coherence

Coherence: Think Across Grades, and Link to Major Topics Within Grades

- Carefully connect the learning within and across grades so that students can build new understanding on foundations built in previous years.
- Begin to count on solid conceptual understanding of core content and build on it. Each standard is not a new event, but an extension of previous learning.

Coherence: *Think* Across Grades

- *Example: Fractions*

- "The **coherence** and sequential nature of mathematics dictate the foundational skills that are necessary for the learning of algebra. The most important foundational skill not presently developed appears to be proficiency with fractions (including decimals, percents, and negative fractions). **The teaching of fractions must be acknowledged as critically important and improved before an increase in student achievement in algebra can be expected**."

- Final Report of the National Mathematics Advisory Panel (2008, p. 18)

Gr. 4	Gr. 5	Gr. 6
Addition and subtraction: • Add and subtract like fractions • Add and subtract related fractions (denominators of given fractions should not exceed 12) Multiplication of a proper or improper fraction and a whole number	Addition and subtraction of fractions with unlike denominators: • Add and subtract fractions with unlike denominators Multiplication and division of fractions: • Multiply proper fractions, improper fractions, mixed numbers and whole numbers by proper fractions, improper fractions, and mixed numbers • Divide fractions by whole numbers and whole numbers by fractions	Division of fractions: • Divide proper fractions by proper fractions Mixed calculations with fraction and decimal: • Know how to solve simple calculations with both fractions and decimals

Informing Grades 1-6 Mathematics Standards Development: What Can Be Learned from High-Performing Hong Kong, Singapore, and Korea? American Institutes for Research (2009, p. 13)

CCSS

Grade 4

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

Grade 5

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

5.NF.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

Grade 6

6.NS. Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

6.NS.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent

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

Shift #3: Rigor

- The CCSSM 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.

Solid Conceptual Understanding

- Teach more than "how to get the answer" and instead support students' ability to access concepts from a number of perspectives
- Students are able to see math as more than a set of mnemonics or discrete procedures
- Conceptual understanding supports the other aspects of rigor (fluency and application)

Name: _____

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

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

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

Fluency in High School

Fluency Recommendations

A/G Algebra I students become fluent in solving characteristic problems involving the analytic geometry of lines, such as writing down the equation of a line given a point and a slope. Such fluency can support them in solving less routine mathematical problems involving linearity, as well as in modeling linear phenomena (including modeling using systems of linear inequalities in two variables).

A-APR.1 Fluency in adding, subtracting and multiplying polynomials supports students throughout their work in algebra, as well as in their symbolic work with functions. Manipulation can be more mindful when it is fluent.

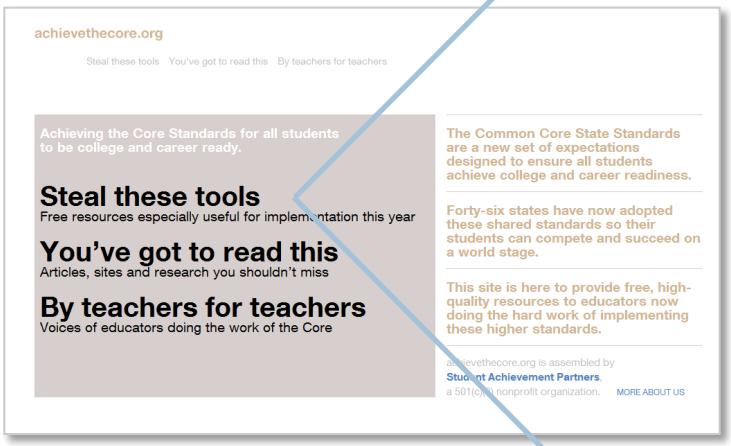
A-SSE.1b Fluency in transforming expressions and chunking (seeing parts of an expression as a single object) is essential in factoring, completing the square and other mindful algebraic calculations.

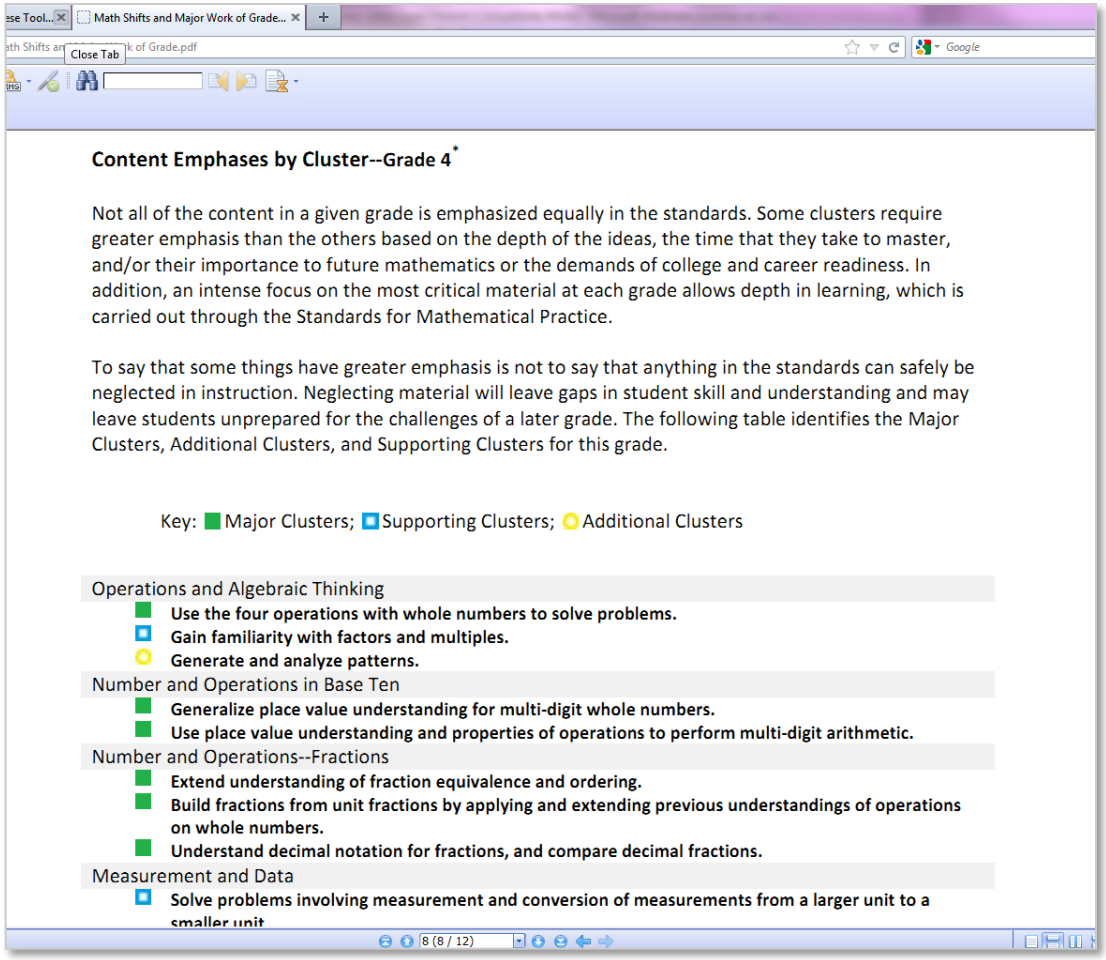
Application

- 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.

It Starts with Focus

- The current U.S. curriculum is "a mile wide and an inch deep."
- Focus is necessary in order to achieve the rigor set forth in the standards.
- Remember Hong Kong example: more in-depth mastery of a smaller set of things pays off.





www.achievethecore.org

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.

Shifts and Practices in Math

Checkpoint:

What is the implication from now on?

What are the most apparent gaps between secondary preparation and post-secondary expectations?

Additional Considerations

- 21st Century Skills including:
- The 4 C's: Collaboration, Communication, Creative Problem Solving, and Critical Thinking
- Navigate to P21.org

See pages 8-11 of the APLU document at the end of this presentation for more information.

Considerations for ELA

- Engage with the standards review and the CCSS implementation at the state level.
- Participate with university government relationships staff in advocating for CCSS and the university role in promoting their successful implementation.
- Create task forces of literacy specialists to question the content of introductory courses and consider what it would take to align those courses with the CCSS in ELA/Literacy, paying particular attention to the College and Career Readiness Capacities and transforming introductory courses so that they are aligned with CCSS (in both content and approach – mindful of the shifts).

See pages 8-11 of the APLU document at the end of this presentation for more information.

Considerations for ELA

- Create partnerships with teacher educators and K–12 educators to develop content courses that will ensure teachers have the content background needed to support students' progress in meeting the CCSS, with particular attention to the College and Career Readiness capacities and the P21 Framework for 21st Century Readiness.
- Engage in collaborative efforts related to supporting K–12 education in the implementation of the CCSS, including teacher recruitment, setting standards for teacher preparation, and providing content support for practicing teachers.

Considerations for Math

- Engage with the standards review and the CCSS implementation at the state level.
- Participate with university government relationships staff in advocating for CCSS and the university role in promoting their successful implementation.
- Create task forces of mathematicians and scientists to question the content of introductory courses and consider what it would take to align those courses with the CCSS in mathematics and science, paying particular attention to the Standards for Mathematical Practice and transforming introductory courses so that they are aligned with CCSS (in both content and approach).

Considerations for Math

- Create task forces of mathematicians and mathematics teacher educators, scientists and science teacher educators to question the content of disciplinary courses targeted for prospective elementary and secondary mathematics and science teachers and consider their alignment with the CCSS in mathematics.
- Create partnerships with teacher educators and K–12 educators to develop content courses that will ensure teachers have the content background needed to support students' progress in meeting the CCSS, with particular attention to the Standards for Mathematical Practice and scientific and engineering practices as described in A Framework for K–12 Science Education.
- Engage in collaborative efforts related to supporting K–12 education in the implementation of the CCSS, including teacher recruitment, setting standards for teacher preparation, and providing content support for practicing teachers.

Source: Montana Office of Public Instruction

What else can Higher Education do now?

- Aligning higher education curriculum with the Common Core State Standards (including revising placement policies and revising curricula of first year courses that act as bridges between K–12 and college majors)
- Representing the voice of higher education in the development of Common Core-aligned assessments.
- Preparing and educating teachers, both prospective and practicing, including revising curriculum in disciplinary departments to prepare teachers to teach the Common Core, revising professional preparation coursework and experiences, and working in partnerships with professional development programs.
- Conducting research on issues of teaching and learning the Common Core State Standards, teacher quality, and the implementation of the Common Core State Standards.

What else can Higher Education do now?

- Increase communication between the colleges and K-12 schools.
- Examine dated methodologies and consider skills related to how students are expected to learn in secondary preparation. (P21.org)
- Let the shifts, capacities, and practices inform collegiate practice
- Create a 2015 action plan.

Questions?

Resources

- The Role of Higher Education from the Association of Public and Land-Grant Universities
- The American Association of State Colleges and Universities
- State Higher Education Executive Officers Association
- CoreStandards.org
- Council of Chief State School Officers
- AchievetheCore.org (Note: Math Shifts section is verbatim from their presentation and used here with permission via their Creative Commons License.)

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