

Common Core State Standards Shifts in Math

Landels Elementary

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Instructional Coach – Ryan Santiago

Support teachers

- Planning, demonstrations, co-teach, and observe
- Provide ongoing support with workshops/initiatives.
- Provide professional development

Support teaching practices...

- School Site
- Grade level teams
- Individual teachers

What is emphasized in the Common Core State Standards?

Grade level Standards

Shifts in ELA

Shifts in Math

What are we doing to address these shifts here at Landels?



Why learn about the shifts?

The Common Core State Standards for *Mathematics and English Language Arts* build on the best of existing standards and reflect the skills and knowledge students will need to succeed in college, career, and life. **Understanding how the standards differ from previous standards—and the necessary shifts they call for—is essential to implementing them.**

corestandards.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.

Math Shifts Presented Differently

3 Shifts

1. Focus
2. Coherence
3. Rigor
 - Conceptual Understanding
 - Procedural Skills and Fluency
 - Application

6 Shifts

1. Focus
2. Coherence
3. Deep Understanding
4. Fluency
5. Application
6. Dual intensity

Key Shift #1 - Focus

- The Common Core calls for greater focus in mathematics. Rather than racing to cover many topics in a mile-wide, inch-deep curriculum, ***the standards ask math teachers to significantly narrow and deepen the way time and energy are spent in the classroom. This means focusing deeply on the major work of each grade as follows.***

- Corestandards.org

Move away from **"mile wide, inch deep"** standards.



Key Shift #1 - Focus

- 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

Key Areas of Focus in Mathematics

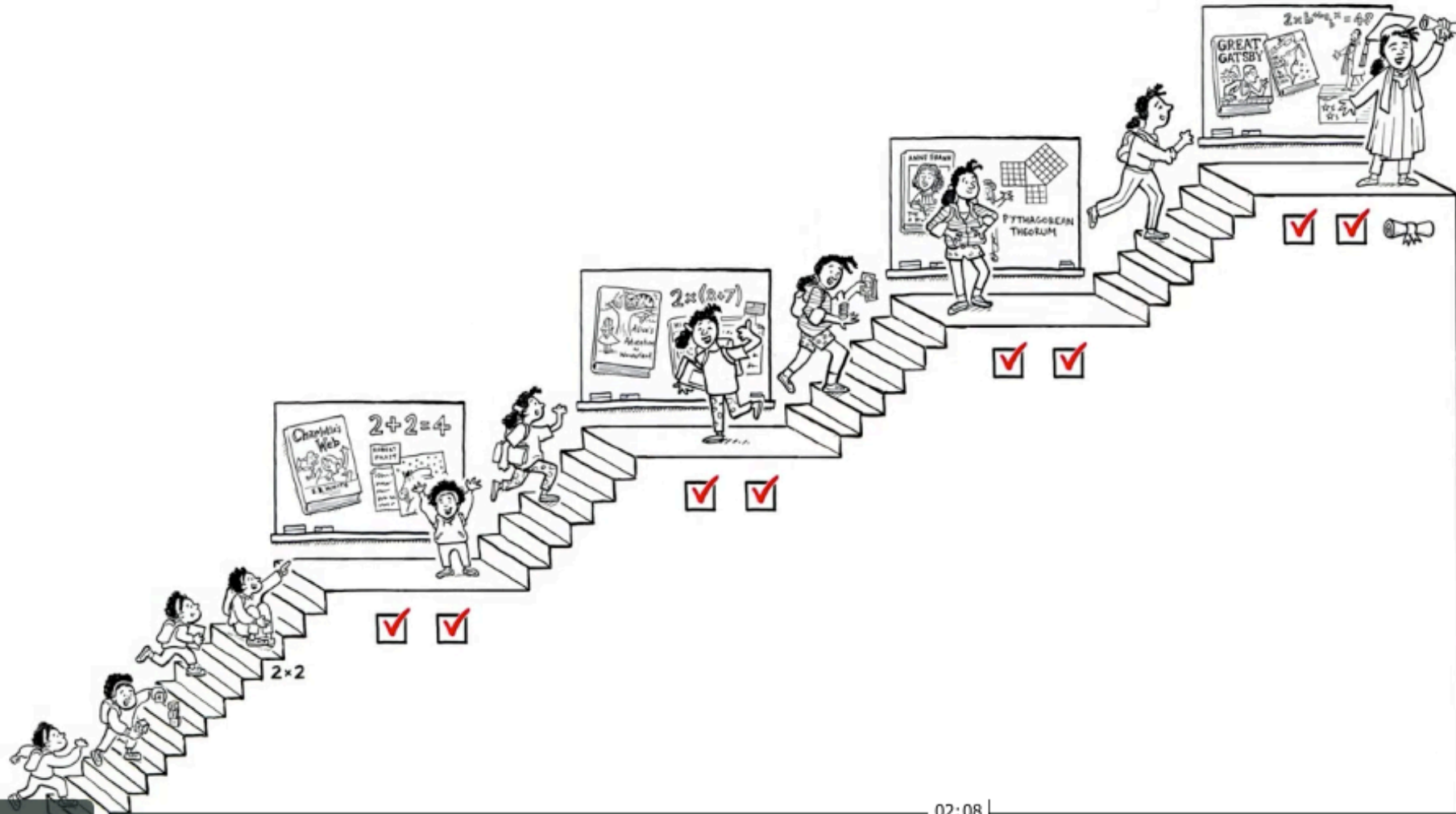
Grade	Focus Areas in Support of Rich Instruction and Expectations of Fluency and Conceptual Understanding
K–2	Addition and subtraction - concepts, skills, and problem solving and place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional reasoning; early expressions and equations
7	Ratios and proportional reasoning; arithmetic of rational numbers
8	Linear algebra and linear functions

Key Shift #2 - Coherence

- ...the standards are designed around coherent progressions from grade to grade. Learning is carefully connected across grades so that students can build new understanding onto foundations built in previous years.
 - Corestandards.org

Shift #2: 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.



$2+2=4$

$2x(n+7)$

PYTHAGOREAN THEOREM

GREAT GATSBY

2×2

02:08

HD

Questions/Comments

- About shift #1 (focus) and Shift #2 (coherence)
- About how we are addressing these shifts here at Landels
- Other

Key Shift #3 - Rigor

- Rigor refers to deep, authentic command of mathematical concepts, not making math harder or introducing topics at earlier grades.
- The CCSSM require a balance of:
 1. Solid conceptual understanding
 2. Procedural skill and fluency
 3. Application of skills in problem solving situations
- Pursuit of all three requires equal intensity in time, activities, and resources.

Key Shift #3 - Rigor: 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)

Key Areas of Focus in Mathematics

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Key Shift #3 Rigor: Conceptual Understanding

Example of rounding with “how to get the answer”

Example of rounding with conceptual understanding

- Define Rounding

- Purpose of Rounding

- Number Line

- Hundred Chart

Why is conceptual understanding important?

- Later in the school year...

 - Estimate the sums

 - Determine compatible numbers and add.

What are we doing here at Landels to develop conceptual understanding?

1. Determine what we are teaching and how to teach it to our students.

Planning days and grade level collaboration

2. Provide definition/explanations and examples of concepts.

Focusing on math vocabulary.

3. Problems requiring demonstration of conceptual understanding and not just skills.

Questions/Comments

- About math shift #3 – Rigor: Conceptual Understanding
- About how we are implementing math shift #3 (rigor: conceptual understanding) here at Landels
- Other

Key Shift #3 - Rigor: Procedural Skills and Fluency

- Fluency - *The word “fluent” is used in the standards to mean “reasonably fast and accurate” and the ability to use certain facts and procedures with enough facility that using them does not slow down or derail the problem solver as he or she works on more complex problems.*
 - *California CCSS Math Frameworks*
- Fluency can look different in each grade level

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

What are we doing here at Landels to address fluency?

- Teachers are structuring class time to provide practice throughout the week
- Timed math facts tests (automaticity and fluency)
- Researching and implementing new strategies to develop fluency

Questions/Comments

- About math shift #3 – Rigor: procedural skills and fluency
- About how we are implementing the shift here at Landels
- Other

Key Shift #3 – Rigor: 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.

Key Shift #3 – Rigor: Application

Example 1:

Daniel had to run laps around the park for his P.E. class. The lap was a rectangle and had a length of 82 yards and a width of 37 yards. How many yards will Daniel run if he had to complete 4 full laps? Draw a picture or write to explain your work.

Example 2:

Daniel ran 4 laps. The perimeter of the rectangular lap had a length of 82 yards and a width of 37 yards. How many yards did he run in all?

Note: rectangle perimeter formula = $l \times 2 + w \times 2$

What are we/we will be doing here at Landels to support application?

Problem Solving Strategies

Understand the situation/concept

Identify key vocabulary

What information is given

What information is missing

Think of a plan (strategy)

Solve

Check answer

Perseverance – don't give up, keep going!

Questions/Comments

- About the shift #3 – rigor: application
- About how we are implementing the shift here at Landels
- Other

Resources

www.achievethecore.org

www.corestandards.org

Ca Common Core Mathematics Framework <http://www.cde.ca.gov/ci/ma/cf/draft2mathfwchapters.asp>