

**COMMON CORE STATE STANDARDS FOR MATHEMATICS**

*Shift One: Focus strongly where the Standards focus.*

Review the table below and answer the questions ‘Which 2 of the following represent areas of major focus for the indicated grade?’

Grade	Which 2 of the following represent areas of major focus for the indicated grade?		
K	Compare numbers	Use tally marks	Understand meaning of addition and subtraction
1	Add and subtract within 20	Measure lengths indirectly and by iterating length units	Create and extend patterns and sequences
2	Represent and solve problems involving addition and subtraction	Understand place value	Identify line of symmetry in two dimensional
3	Multiply and divide within 100	Identify the measures of central tendency and distribution	Develop understanding of fractions as numbers
4	Examine transformations on the coordinate plane	Generalize place value understanding for multi-digit whole numbers	Extend understanding of fraction equivalence and ordering
5	Understand and calculate probability of single events	Understand the place value system	Apply and extend previous understandings of multiplication and division to multiply and divide fractions
6	Understand ratio concepts and use ratio reasoning to solve problems	Identify and utilize rules of divisibility	Apply and extend previous understandings of arithmetic to algebraic expressions
7	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers	Use properties of operations to generate equivalent expressions	Generate the prime factorization of numbers to solve
8	Standard form of a linear equation	Define, evaluate, and compare functions	Understand and apply the Pythagorean Theorem
Alg.1	Quadratic inequalities	Linear and quadratic functions	Creating equations to model situations
Alg.2	Exponential and logarithmic functions	Polar coordinates	Using functions to model situations

## Reflecting on Actions to Implement the Connecticut Core Standards for Mathematics

	What it looks like/sounds like when it is happening	Challenges to getting our school there	Early actions – Steps we can take right away
<b>Focus</b> strongly where the Standards focus			
<b>Coherence:</b> <b>Think</b> across grades, and <b>link</b> to major topics within grades			
<b>Rigor:</b> In major topics pursue <b>conceptual understanding</b> , procedural skill and <b>fluency</b> , and <b>application</b> with equal intensity			

## Rigor in the Language of the Standards

Read the standard and identify the aspect of rigor the most closely aligns, conceptual understanding (CU), procedural skill and fluency (PF), or application (A). If more than one component, identify which part of the standard applies.

K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem. **CU PF A**

1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions. **CU PF A**

1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. **CU PF A**

2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. **CU PF A**

3.NBT.A.2  
Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. **CU PF A**

4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. **CU PF A**

5.NBT.1: Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. **CU PF A**

6.RP.A: Understand ratio concepts and use ratio reasoning to solve problems. **CU PF A**

6.SP.3: Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

7.NS.3: Solve real-world and mathematical problems involving the four operations with rational numbers. **CU PF A**

7.SP.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **CU PF A**

7.EE.2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. **CU PF A**

8.F.1: Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. **CU PF A**

8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. **CU PF A**

N.RN.3: Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. **CU PF A**

A.SSE.2: Use the structure of an expression to identify ways to rewrite it. **CU PF A**

### Rigor in Tasks

- Write three fractions equivalent to  $\frac{40}{10}$ . All three numerators must be less than 40.
- Solve each equation or write that there are no solutions or infinitely many solutions. Show your work.

$$17 + 5(2x - 9) = (-6x + 10) + 4$$

$$\frac{2}{3}(2x + 12) = 16$$

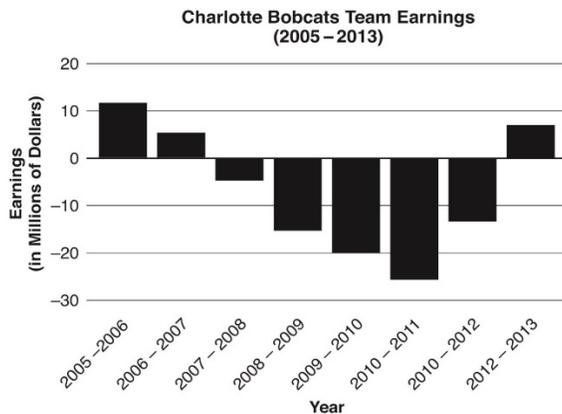
- Would you expect the relationship between the number of books a person buys at a bookstore and the total cost of the books to be proportional? Explain your answer and include any assumptions you made.
- 

Which number is larger?

1.7 or 17 twelfths

Explain how you can tell without drawing a picture.

- A box 2 centimeters high, 3 centimeters wide, and 5 centimeters long can hold 40 grams of clay. A second box has twice the height, three times the width, and the same length as the first box. How many grams of clay can it hold?
- Will owning an NBA Team make you rich?  
The graph below shows the earnings (the amount the team made or lost) for the Charlotte Bobcats from 2005–2013.



Based on the above graph, estimate the average yearly earnings for the Charlotte Bobcats between 2005 and 2013. Explain your answer with numbers, words, and/or pictures.

7.

A grower packs 4,568 peaches. He packs the most peaches possible, dividing them equally into 9 boxes, and then gives away the remaining peaches.

- How many peaches does he give away?
- If he sells 7 boxes, how many peaches does he have left?

8

$$9 + 3 = \square$$

$$12 - 7 = \square$$

$$8 + 6 = \square$$

9. Evaluate the following numerical expressions.

$$2(5+(3)(2)+4)$$

$$2((5+3)(2+4))$$

$$2(5+3(2+4))$$

Can the parentheses in any of these expressions be removed without changing the value the expression?

10. Adeline buys 8 packs of Fun Gum. Each pack has 7 pieces of gum. Marisol buys Juicy Gum. Each Juicy Gum pack has 9 pieces of gum.

Adeline has 11 more pieces of gum than Marisol.

How many packs of gum did Marisol buy?

11. The table below contains single equations in a single variable. Decide whether there are no real solutions, exactly 1 real solution, or exactly 2 real solutions. Check the appropriate box for each row.

		No Real Solutions	Exactly 1 Real Solution	Exactly 2 Real Solutions
a.	$(a + 5)^2 = 25$			
b.	$(n - 5)^2 = 25$			
c.	$(z + 5)^2 = -25$			
d.	$(x - 5)^2 = 0$			
e.	$16 - (l + 5)^2 = 25$			



## Lesson Plan Analysis Template - Math

### Core Action 1: The lesson focuses strongly where the standards focus

#### Discussion Questions

Which standard(s) and/or cluster(s) are targeted in this lesson?

Does the lesson address a part of the standard(s) or all aspects of the standard(s)?

Are they grade-level standards?

Are these standards major, supporting or additional work of the grade?

If the standard(s) targeted are Supporting or Additional Work of the grade, how will connections be made to engage students in the Major Work of the grade?

What ideas/concepts will be the focus of discussions?

How does the teacher plan to summarize the mathematics of the lesson? Will the summary include student work and discussion to reinforce the mathematical learning goal of the lesson?

**Core Action 2: The lesson intentionally relates new concepts to students' prior skills and knowledge.**

## Discussion Questions

How does the teacher plan to make explicit connections to build on students' prior skills and knowledge?

What will the teacher say to students or show students to make this connection clear?

What supports are planned for students who are struggling?

What extensions are planned for students who are above grade level?

**Core Action 3: As appropriate for the standards being addressed, the lesson targets the three aspects of rigor.**

## Discussion Questions

Which aspect(s) of Rigor (conceptual understanding, procedural skill and fluency, and application) do the targeted standards require?

What features of the lesson support the aspect(s) of Rigor present in the targeted standards?

How does the teacher plan to use explanations, representations, tasks, and/or examples that will make the mathematics of this lesson clear to students?

Are mathematical models, mathematical representations, mathematical arguments, and mathematical counter-arguments expected from students, as required by the Standards?

## CORE ACTIONS AND INDICATORS

For the complete Instructional Practice Guide, go to [achievethecore.org/instructional-practice](https://achievethecore.org/instructional-practice).

MATH  
SUBJECT

K–8  
GRADES

### Core Action 1

Ensure the work of the enacted lesson reflects the Focus, Coherence, and Rigor required by college- and career-ready standards in mathematics.

- A. The enacted lesson focuses on the grade-level cluster(s), grade-level content standard(s), or part(s) thereof.

Mathematical learning goal: \_\_\_\_\_

Standard(s) addressed in this lesson: \_\_\_\_\_

- B. The enacted lesson appropriately relates new content to math content within or across grades.
- C. The enacted lesson intentionally targets the aspect(s) of Rigor (conceptual understanding, procedural skill and fluency, application) called for by the standard(s) being addressed.

Circle the aspect(s) of Rigor targeted in the standard(s) addressed in this lesson: Conceptual understanding / Procedural skill and fluency / Application

Circle the aspect(s) of Rigor targeted in this lesson: Conceptual understanding / Procedural skill and fluency / Application

### Core Action 2

Employ instructional practices that allow all students to learn the content of the lesson.

- A. The teacher makes the mathematics of the lesson explicit through the use of explanations, representations, tasks, and/or examples.
- B. The teacher strengthens all students' understanding of the content by strategically sharing students' representations and/or solution methods.
- C. The teacher deliberately checks for understanding throughout the lesson to surface misconceptions and opportunities for growth, and adapts the lesson according to student understanding.
- D. The teacher facilitates the summary of the mathematics with references to student work and discussion in order to reinforce the purpose of the lesson.

### Core Action 3

Provide all students with opportunities to exhibit mathematical practices while engaging with the content of the lesson.

- A. The teacher provides opportunities for all students to work with and practice grade-level problems and exercises.  
Students work with and practice grade-level problems and exercises.
- B. The teacher cultivates reasoning and problem solving by allowing students to productively struggle.  
Students persevere in solving problems in the face of difficulty.
- C. The teacher poses questions and problems that prompt students to explain their thinking about the content of the lesson.  
Students share their thinking about the content of the lesson beyond just stating answers.
- D. The teacher creates the conditions for student conversations where students are encouraged to talk about each other's thinking.  
Students talk and ask questions about each other's thinking, in order to clarify or improve their own mathematical understanding.
- E. The teacher connects and develops students' informal language and mathematical ideas to precise mathematical language and ideas.  
Students use increasingly precise mathematical language and ideas.

If any uncorrected mathematical errors are made during the context of the lesson (instruction, materials, or classroom displays), note them here.

**CORE ACTION 1: Ensure the work of the enacted lesson reflects the Focus, Coherence, and Rigor required by college- and career-ready standards in mathematics.**

**INDICATORS / NOTE EVIDENCE OBSERVED OR GATHERED FOR EACH INDICATOR**

**RATING**

A. The enacted lesson focuses on the grade-level cluster(s), grade-level content standard(s), or part(s) thereof.

Mathematical learning goal:

Standard(s) addressed in this lesson:

Yes- The enacted lesson focuses only on mathematics within the grade-level standards.  
 No- The enacted lesson focuses on mathematics outside the grade-level standards.

B. The enacted lesson appropriately relates new content to math content within or across grades.

Yes- The enacted lesson builds on students' prior skills and understandings.  
 No- The enacted lesson does not connect or has weak connections to students' prior skills and understandings.

C. The enacted lesson intentionally targets the aspect(s) of Rigor (conceptual understanding, procedural skill and fluency, application) called for by the standard(s) being addressed.

Circle the aspect(s) of Rigor targeted in the standard(s) addressed in this lesson:  
 Conceptual understanding / Procedural skill and fluency / Application

Circle the aspect(s) of Rigor targeted in this lesson:  
 Conceptual understanding / Procedural skill and fluency / Application

Yes- The enacted lesson explicitly targets the aspect(s) of Rigor called for by the standard(s) being addressed.  
 No- The enacted lesson targets aspects of Rigor that are not appropriate for the standard(s) being addressed.

**CORE ACTION 2: Employ instructional practices that allow all students to learn the content of the lesson.**

INDICATORS <sup>3</sup> / NOTE EVIDENCE OBSERVED OR GATHERED FOR EACH INDICATOR	RATING
<p>A. The teacher makes the mathematics of the lesson explicit through the use of explanations, representations, tasks, and/or examples.</p> <p style="text-align: right;"><input type="checkbox"/> NOT OBSERVED</p>	<p>4- A variety of instructional techniques and examples are used to make the mathematics of the lesson clear.</p> <p>3- Examples are used to make the mathematics of the lesson clear.</p> <p>2- Instruction is limited to showing students how to get the answer.</p> <p>1- Instruction is not focused on the mathematics of the lesson.</p>
<p>B. The teacher strengthens all students' understanding of the content by strategically sharing students' representations and/or solution methods.</p> <p style="text-align: right;"><input type="checkbox"/> NOT OBSERVED</p>	<p>4- Student solution methods are shared, and connections to the mathematics are explicit and purposeful. If applicable, connections between the methods are examined.</p> <p>3- Student solution methods are shared, and some mathematical connections are made between them.</p> <p>2- Student solution methods are shared, but few connections are made to strengthen student understanding.</p> <p>1- Student solution methods are not shared.</p>
<p>C. The teacher deliberately checks for understanding throughout the lesson to surface misconceptions and opportunities for growth, and adapts the lesson according to student understanding.</p> <p style="text-align: right;"><input type="checkbox"/> NOT OBSERVED</p>	<p>4- There are checks for understanding used throughout the lesson to assess progress of all students, and adjustments to instruction are made in response, as needed.</p> <p>3- There are checks for understanding used throughout the lesson to assess progress of some students; minimal adjustments are made to instruction, even when adjustments are appropriate.</p> <p>2- There are few checks for understanding, or the progress of only a few students is assessed. Instruction is not adjusted based on students' needs.</p> <p>1- There are no checks for understanding; therefore, no adjustments are made to instruction.</p>
<p>D. The teacher facilitates the summary of the mathematics with references to student work and discussion in order to reinforce the purpose of the lesson.</p> <p style="text-align: right;"><input type="checkbox"/> NOT OBSERVED</p>	<p>4- The lesson includes a summary with references to student work and discussion that reinforces the mathematics.</p> <p>3- The lesson includes a summary with a focus on the mathematics.</p> <p>2- The lesson includes a summary with limited focus on the mathematics.</p> <p>1- The lesson includes no summary of the mathematics.</p>

3. These actions may be viewed over the course of 2-3 class periods.