

## Implementing a Common Core Curriculum with CMP2

### Introduction

This guide discusses meeting the Common Core State Standards for Mathematics (CCSSM) with CMP2. It shows you the Common Core curriculum resources that Pearson has developed and integrated into the program, so that you can prepare for a successful implementation.

### CMP2 Common Core Implementation Kit

The CMP2 Common Core Implementation Kit includes several resources to help you tackle the CCSSM. These resources are available in print or online. You can download the resources by clicking the Worksheet Center link.

The resources consist of *Implementing a Common Core Curriculum*, a *Common Core Investigations* Teacher’s Guide for each grade level, and a Common Core Additional Investigations grade-level student unit. *Implementing a Common Core Curriculum* is a great place to start.

### Implementing a Common Core Curriculum

This resource contains information about both the Standards for Mathematical Content and the Standards for Mathematical Practice, which are the two sets of standards that make up the CCSSM. First, take a look at the Standards for Mathematical Content.

### Standards for Mathematical Content

There are three sections in the chapter titled The Standards for Mathematical Content—Main Areas of Emphasis in Grades 6, 7, and 8, Domain Progressions Across Grades, and What’s Different?

### The Standards for Mathematical Content

The Common Core State Standards for Mathematics represent the collaborative efforts of mathematicians, researchers, educators, and state education officials from 48 states and the District of Columbia to develop a single set of rigorous and internationally benchmarked standards for K–12 mathematics. These standards set clear expectations for what students are to know and be able to do at each grade level from Kindergarten through High School.

The guiding principles framed the development of the Standards for Mathematical Content, that they be based on evidence and research and build on the strengths of current state standards and that at each grade level, the standards be fewer in number, but clearer and more rigorous. The reduced number of standards at each grade level challenged the writing team to articulate a progression of concepts and from that progression, to identify critical areas for each grade level.

#### Main Areas of Emphasis in Grade 6

- ratio and unit rate
- division of fractions and positive rational (or decimal) numbers
- variables, expressions, and equations
- statistical thinking
- area, surface area, and volume

Grade 6 students draw from their knowledge of whole-number multiplication and division as they begin their study of ratios and rates. They use equivalent ratios as derived from multiplication tables, and analyze drawings that illustrate relative size of quantities to expand their understanding of multiplication and division to ratios.

Students extend their work with fraction operations to dividing fractions and mixed numbers. They show an initial knowledge of multiplication and division

#### Main Areas of Emphasis in Grade 7

- proportional relationships and applying these relationships to solve problems
- operations with rational numbers, expressions and linear equations
- scale drawings and informal geometric constructions; attributes of circles
- drawing inferences about populations based on samples; concepts of chance

In Grade 7, students extend their study of ratios and rates to develop an understanding of proportionality. They solve problems related to proportional relationships, including a range of percent problems (e.g., discounts, interest, taxes, tip, percent of increase/decrease). They apply the concept of proportionality to scale drawings and solve problems of scale. They graph proportional relationships and develop an informal understanding of slope. They differentiate proportional relationships from other relationships.

Students develop a holistic understanding of number as they explore rational numbers in different forms of representation (e.g., fractions, decimals, and

#### Main Areas of Emphasis in Grade 8

- expressions and equations, including systems of linear equations
- functions to describe quantitative relationships
- analysis of two- and three-dimensional space and figures and the Pythagorean Theorem

In Grade 8, students engage in formal study of algebraic expressions and linear equations. They write and use linear equations, linear functions and

- geometry and interpret negative numbers in everyday context (e.g., temperature change). Students extend their knowledge of operations and properties of operations to solve problems with any rational numbers, both positive and negative rational numbers. They solve equations and equations in one variable to solve problems.

Students expand their reasoning about objects to include circles. They build on their knowledge of geometric attributes and formulas to determine the circumference and area of a circle and the surface area and volume of any polyhedron. They reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions. They solve problems involving angles formed by intersecting lines, and they examine cross-sections of three-dimensional figures.

Students continue their study of statistical thinking by exploring the concept of random sampling. By comparing two data distributions and describing differences between the populations, students begin to understand the importance of representative samples for drawing valid inferences about populations.

### Main Areas of Emphasis

The Main Areas of Emphasis section lists the instructional focus and gives examples of how each focus progresses throughout the middle grades.

**Domain Progressions Across Grades**

The next section, Domain Progressions Across Grades, shows how key concepts develop through Grades 6 through 8.

Look at an example with Ratios and Proportional Relationships. Students begin their study of ratios in Grade 6.

Kai is responsible for feeding the animals at the shelter.

**A.** He makes a table to record the amount of food each dog gets.

Dogs		
Name	Weight (in pounds)	Food (in cups)
Beauty	24	2
Scruffy	48	4
Sport	36	3
Fifi	12	
Honey		5

1. Write ratios for Beauty, Scruffy, and Sport that compare the dog's weight to the amount of food that the dog receives.
2. Compare the ratios and explain what the comparison tells you about how the dogs are fed.
3. Complete the table for Fifi and Honey.
4. Explain how to use a ratio to find the amount of food any new dog at the shelter should receive.

In Grade 7, students build on their knowledge of ratios as they apply proportional relationships to real-life problems.

**8. a.** Find the unit price for each size of packaging.

**b.** Which size offers the best unit price?

**c.** Find the new unit price for the 8-pack if it goes on sale for \$1.99.

**d.** What is the least expensive way to buy 24 bottles of water during the sale period?

Bottled Water	
Price	Quantity
\$2.19	4
\$3.59	8
\$6.99	24

In Grade 8, students compare proportional relationships in the formal study of slopes.

**C.** Suppose Ramon's twin brother, Ricardo, also runs in the race. Ramon gives Ricardo a 10-m head-start in the race, and they run at the same speed. The graph shows their results.

1. Represent Ramon's position with an equation.
2. What do the points (0, 0) and (0, 10) on the graph represent?
3. Are the lines parallel? Explain.
4. How does a translation of Ramon's line 10 units up compare with Ricardo's line on the graph?
5. Ricardo runs at a constant rate of 5 m/sec and has a head start of 10 m. Write an equation of the line representing Ricardo's position,  $y$ , at time  $x$ .
6. Write an equation in slope-intercept form for a line that has slope  $m$  and contains the point  $(0, b)$ .

If you have been teaching with CMP2, you have probably noticed that you are teaching many of the Standards for Mathematical Content already. What math content may differ in your new Common Core curriculum?

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**What's Different?**

Each grade-level curriculum has content that typically was not covered in that grade. For example, in geometry, circles were previously taught in sixth grade and are now a seventh-grade standard. Whereas, surface area and nets have shifted from seventh grade to sixth grade.

Students in eighth grade are now prepared to learn more complex geometry topics that they were previously taught in high school geometry.

To see the topics in Grades 6 through 8 that have shifted to a previous or subsequent grade, look at the What's Different? page in *Implementing a Common Core Curriculum*.

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**Standards for Mathematical Practice**

Focusing on the eight Standards for Mathematical Practice will help your students develop mathematical behaviors. These behaviors help them build a deep understanding of important math concepts and make connections among these important concepts.

For example, go to page 9 where you will learn about the standard, "Reason abstractly and quantitatively."

**Mathematical Practices**

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.

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**Reason Abstractly and Quantitatively**

Students who are mathematically proficient in this practice

- use symbolic expressions to represent problems; and
- explain the meaning of numbers and quantities.

CMP2 supports students in this practice by requiring them to

- translate a problem situation into an equation and verify the solution; and
- acquire mathematical language and ways of reasoning by engaging in mathematical arguments.

You can also find specific investigations throughout the CMP2 units that give students an opportunity to put the standard into practice.

**Other Available Resources**

The *Implementing a Common Core Curriculum* Teacher’s Guide contains other useful resources to help you prepare to teach the CCSSM.

There are so many resources to use in *Implementing a Common Core Curriculum*, but for now, open the Common Core Investigations Teacher’s Guide.

**Common Core Investigations Teacher’s Guide**

In your Teacher’s Guide, you will find a correlations chart that aligns the CCSSM with the CMP2 program. You will see the Grade 7 Correlations chart.

Every Grade 7 standard aligns to corresponding CMP2 units and specific Investigations in the Content column. These are Investigations from your CMP2 curriculum, which also include supplemental Investigations from the Common Core Additional Investigations unit. Your Teacher’s Guide refers to these as Common Core Investigations.

CONTENT
CC Inv. 1: Graphing Proportions
Inv. 1: Making Comparisons Inv. 2: Comparing Ratios, Percents, and Fractions Inv. 3: Comparing and Scaling Rates Inv. 4: Making Sense of Proportions
Inv. 4: Making Sense of Proportions CC Inv. 1: Graphing Proportions
Inv. 3: Comparing and Scaling Rates Inv. 4: Making Sense of Proportions Inv. 1: Walking Rates Inv. 2: Exploring Linear Functions With Graphs and Tables Inv. 3: Solving Equations Inv. 4: Exploring Slope

**Pacing Guide**

The Teacher’s Guide also provides a Pacing Guide that offers suggestions as you prepare to implement the CCSSM into your CMP2 classroom. The chart shows placement recommendations for the additional Common Core Investigations.

Take a look at an example from Grade 7 and see how to incorporate the Common Core Investigations.

Moving Straight Ahead	Standard 30 days • Block 15 days	
Inv. 1 Walking Rates	7.EE.3, 7.EE.4, 7.EE.4.a	✓
Inv. 2 Exploring Linear Functions With Graphs and Tables	7.EE.3, 7.EE.4, 7.EE.4.a, 7.EE.4.b (ACE 44)	✓
Inv. 3 Solving Equations	7.EE.1, 7.EE.3, 7.EE.4, 7.EE.4.a	✓
Inv. 4 Exploring Slope	7.EE.1, 7.EE.3, 7.EE.4, 7.EE.4.a	✓
CC Inv. 1 Graphing Proportional Relationships	7.RP.1, 7.RP.2.a, 7.RP.2.d	✓
CC Inv. 2 Equivalent Expressions	7.EE.1, 7.EE.2	✓
CC Inv. 3 Inequalities	7.NS.3, 7.NS.4.b	✓

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**Common Core Investigations**

The first column in the Pacing Guide lists the CMP2 unit and suggested Investigations. The second column lists the CCSSM taught in each Investigation. The third column identifies the Investigations as Core Content, Review (to activate prior knowledge), or Extending (to go deeper).

The suggested number of standard days for each unit is based on a forty-five-minute class period; a block period is assumed to be ninety minutes of instructional time. Where will you find the extra time to teach these additional Common Core Investigations?

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**A Pacing Example**

Common Core students entering Grade 7 are introduced to ratios and rates, expressions and equations, integers, and volumes and nets of solids in Grade 6. Because of these prior understandings, students will begin Variables and Patterns, Comparing and Scaling, Accentuate the Negative, and Filling and Wrapping with the requisite skills to complete these units at an accelerated pace. This will leave time in the year for you to teach the Common Core Investigations needed for Grade 7.

With the additional resources in your CMP2 Common Core Implementation Kit, you can be assured that you have all the tools you need to fully embrace the CCSSM and prepare your students for the rigor of high school mathematics.

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**Review**

This guide discussed how to implement the CCSSM using the CMP2 Common Core Implementation Kit.

It looked at the additional Common Core resources developed for CMP2 and discussed how to use them to effectively integrate the standards into your math classroom.

This guide also discussed how to use the Correlation chart, the Pacing Guide, and the Common Core Investigations to maintain the successful instructional approach of the CMP2 Math program, while highlighting the connections to the Standards for Mathematical Practice.