



**The New York City
Department of Education**

**Grade 8 Mathematics Baseline
Assessment**

Teacher Version

September 24, 2012–June 14, 2013



Test Design and Instructional Purpose

The Mathematics Baseline Assessment is designed to help you collect *some* information about your students' mathematical readiness for the work they will encounter in eighth grade. This information can provide insight around students' understanding of the skills, concepts, and application necessary to support successful engagement in the major work of eighth grade. Consequently, the results from the Baseline Assessment may assist you in developing instructional plans that will help your students meet the Common Core expectations for eighth grade.

The assessment is composed of three sections that assess skills and content from the previous grade. Each section has a particular focus. The focus of each section was determined by identifying concepts from seventh grade that support major concepts in eighth grade. All of the items are multiple-choice and were developed to assess a student's understanding of a particular part(s) of a standard, cluster, or domain.

This assessment is meant to be a resource for identifying and understanding some of the skills and concepts that may need to be reinforced/taught if students did not learn them in the previous grade. Please note that since schools are at different points in their transition to the Common Core Learning Standards, students may or may not have been exposed to the Common Core Learning Standards of the preceding grade. The results of this assessment will best support your instruction and your students' learning if you are familiar with the Common Core Learning Standards including the fluency expectations, key advances, and culminating standards.

Limitations

The Baseline Assessment is not an exhaustive test. Some important Common Core Learning Standards contain prerequisite skills and concepts that could not be assessed on this test.

As a result, this assessment is best used as part of a comprehensive set of evaluative measures that include teacher observation, classwork, homework, and school- or teacher-made assessments.

Test Content

In Grade 7, the major work focuses largely on building fluency with rational numbers; solving problems involving rational numbers and measurements; analyzing proportional relationships; working with percentages (simple interest, percent increase and decrease, tax, etc.); solving problems involving unit rates associated with ratios of fractions; and analyzing proportional relationships in geometric figures. Additionally, Grade 7 focuses on solving multi-step problems with positive and negative rational numbers (whole numbers, fractions and decimals); applying properties of operations to rewrite linear expressions with rational coefficients fluently; and solving word problems leading to one-variable equations of the form $px + q = r$ and $p(x + q) = r$, fluently. In Grade 8, students build on their work with proportional relationships, unit rates, and graphing to understand the connections between proportional relationships, lines, and linear equations. Additionally, students advance their understanding of the number system to include irrational numbers (radical expressions) and build on their work with linear relationships by working with functions.

Section 1 (12 items): This section focuses on proportional relationships, unit rates, and graphing.

Section 2 (9 items): This section focuses operations with rational numbers, including integers.

Section 3 (9 items): This section focuses on generating equivalent expressions and solving problems with algebraic expressions and equations.

Math Baseline Grade 8 Report*	
Section 1 Standards 7.RP.1; 7.RP.2a; 7.RP.2b; 7.RP.2c; 7.RP.2d; 7.RP.3	A student who correctly answers the questions in Section 1 evidences an understanding of proportional relationships, unit rates, and graphing. These skills will support students in understanding the connections between proportional relationships, lines, and linear equations.
Section 2 Standards 7.NS.1d; 7.NS.2c; 7.NS.2d; 7.NS.3	A student who correctly answers the questions in Section 2 evidences an understanding of operations with rational numbers, including integers. These skills will support students in Grade 8 in advancing their understanding of the number system to include irrational numbers (radical expressions).
Section 3 Standards 7.EE.1; 7.EE.3; 7.EE.4a; 7.EE.4b	A student who correctly answers the questions in Section 3 evidences an understanding of how to generate equivalent expressions and how to solve problems using algebraic expressions and equations. Students will apply these concepts in Grade 8 as they begin working with functions.

*Listed standards indicate that at least one item is partially aligned to that standard.

Section 1 Items:

Grade	Domain	Cluster	Standard	Items
7	Ratios and Proportional Relationships	Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.	3,4
7	Ratios and Proportional Relationships	Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.2.a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	1,6
7	Ratios and Proportional Relationships	Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.2.b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	7
7	Ratios and Proportional Relationships	Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.2.c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed as $t = pn$.	2,5
7	Ratios and Proportional Relationships	Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.2.d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.	9,12
7	Ratios and Proportional Relationships	Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	8,10, 11

Section 2 Items:

Grade	Domain	Cluster	Standard	Items
7	The Number System	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	7.NS.1d. Apply properties of operations as strategies to add and subtract rational numbers.	15,16
7	The Number System	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	7.NS.2c. Apply properties of operations as strategies to multiply and divide rational numbers.	14,20
7	The Number System	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	7.NS.2d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	13,17
7	The Number System	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	7.NS.3. Solve real-world and mathematical problems involving the four operations with rational numbers.	18,19,21

Section 3 Items:

Grade	Domain	Cluster	Standard	Items
7	Expressions and Equations	Use properties of operations to generate equivalent expressions.	7.EE.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	23,27
7	Expressions and Equations	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	7.EE.3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	22,26, 30
7	Expressions and Equations	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	7.EE.4a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?	24,25
7	Expressions and Equations	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	7.EE.4b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.	28,29



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