

Orange Public Schools

Office of Curriculum & Instruction
2019-2020 Mathematics Curriculum Guide



7th Grade Mathematics

Math in Focus - Unit 2: Expressions & Equations

November 14, 2019 – January 30, 2020

ORANGE TOWNSHIP BOARD OF EDUCATION

Tyrone Tarver
President

Brenda Daughtry
Vice President

Members

Guadalupe Cabido
Shawneque Johnson

Sueann Gravesande
Cristina Mateo
Jeffrey Wingfield

Derrick Henry
Siaka Sherif

SUPERINTENDENT OF SCHOOLS

Gerald Fitzhugh, II, Ed.D.

BUSINESS ADMINISTRATOR/BOARD SECRETARY

Adekunle O. James

EXECUTIVE DIRECTOR OF HUMAN RESOURCES

Glasshebra Jones-Dismuke

DIRECTORS

Karen Harris, *English Language Arts/Testing*
Tina Powell, Ed.D., *Math/Science*

Shelly Harper, *Special Services*
Terri Russo, D.Litt., *Curriculum & Instruction*

SUPERVISORS

Olga Castellanos, *Math (K-4)*
Meng Li Chi Liu, *Math (9-12)*
Daniel Ramirez, *Math (5-8)*
Donna Sinisgalli, *Visual & Performance Arts*
Kurt Matthews, *ELA (8-12) & Media Specialist*
Linda Epps, *Social Studies (5-12) /Tech Coordinator*
Tia Burnett, *Testing*
Jahmel Drakeford, *CTE (K-12)/Health & Phys Ed*

Janet McCloudden, Ed.D., *Special Services*
Rosa Lazzizera, *ELA (3-7) & Media Specialist*
Adrianna Hernandez, *ELA (K-2) & Media Specialist*
Frank Tafur, *Guidance*
Henie Parillon, *Science (K-12)*
Caroline Onyesonwu, *Bilingual/ESL & World Lang*
David Aytas, *STEM Focus (8-12)*
Amina Mateen, *Special Services*

PRINCIPALS

Faith Alcantara, *Heywood Avenue School*
Yancisca Cooke, Ed.D., *Forest St. Comm School*
Robert Pettit, *Cleveland Street School (OLV)*
Cayce Cummins, Ed.D., *Newcomers Academy*
Debra Joseph-Charles, Ed.D., *Rosa Parks Comm School*
Denise White, *Oakwood Ave. Comm School*

Jason Belton, *Orange High School*
Jacquelyn Blanton, *Orange Early Childhood Center*
Dana Gaines, *Orange Prep Academy*
Myron Hackett, Ed.D., *Park Ave. School*
Karen Machuca, *Scholars Academy*
Erica Stewart, Ed.D., *STEM Academy*
Frank Iannucci, Jr., *Lincoln Avenue School*

ASSISTANT PRINCIPALS

Carrie Halstead, *Orange High School*
Mohammed Abdelaziz, *Orange High/Athletic Director*
Oliverto Agosto, *Orange Prep Academy*
Terence Wesley, *Rosa Parks Comm School*
Samantha Sica-Fossella, *Orange Prep. Academy*
Kavita Cassimiro, *Orange High School*
Lyle Wallace, *Twilight Program*
Isabel Colon, *Lincoln Avenue School*

Nyree Delgado, *Forest Street Comm School*
Devonii Reid, Ed.D., *STEM Academy*
Joshua Chuy, *Rosa Parks Comm School*
Gerald J. Murphy, *Heywood Ave School*
Shadin Belal, Ed. D. *Orange Prep Academy*
April Stokes, *Park Avenue School*
Noel Cruz, *Dean of Students/Rosa Parks Comm School*
Patrick Yearwood, *Lincoln Avenue School*

From the Common Core State Standards:

In **Grade 7**, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

1. Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.

2. Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.

3. Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.

4. Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

A STORY OF UNITS

	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
K											
1											
2											
3											
4											
5											
6											
7	The Number System			Expressions & Equations		Ratios & Proportional Relationships		Statistics & Probability /Geometry			



The Number System:
Operations with Rational Numbers



Expressions & Equations: Use properties of operations to generate equivalent fractions and solve real-life problems using numerical & algebraic expressions & equations



Ratios & Proportional Relationships:
Analyze proportional relationships and use them to solve real-world and mathematical problems



Statistics & Probability / Geometry: Use random sampling, draw inferences, investigate chance processes, evaluate probability models, construct geometrical figures, and solve real-life problems.

Table of Contents

I.	Unit Overview	p. 1
II.	Pacing Guide	p. 2
III.	Pacing Calendar	p. 3-5
IV.	NJSLA Assessment Evidence Statement	p. 6-8
V.	Differentiated Instruction	p. 9-10
VI.	Vocabulary	p. 11
VII.	Assessment Framework	p. 12
VIII.	Performance Tasks	p. 13-19
IX.	Modifications	p. 20-23
X.	Core Instruction & Supplemental Resources	p. 24-27

References

“Math in Focus” *Houghton Mifflin Harcourt*. 2015 <<https://my.hrw.com>>

I. Unit Overview

Chapter 3: Algebraic Expressions: In this chapter, students extend their knowledge to more complex expressions. They learn to simplify, expand, and factor increasingly complex algebraic expressions. Students close the chapter by solving real-world problems. They create bar models and diagrams to help them visualize algebraic situations.

Chapter 4: Algebraic Equations and Inequalities: In this chapter, students learn to identify equivalent equations. They solve multi-step equations with variables on both sides, including equations with parentheses, and they learn to solve real-world problems algebraically. After solving equations, students learn how to solve inequalities, graph the solution set of an inequality, and use inequalities to solve real-world problems.

Essential Questions

- How can we generate equivalent expressions?
- What is an equation?
- How can we create an equation (or inequality) for a given situation?
- What does it mean to evaluate algebraic expressions?
- How can we solve multi-step equations?
- How can we check that solution?
- How can we simplify equations, using the number properties, before looking for a solution?
- How should we apply inverse operations to solve equations and or inequalities?
- How should we deal with negative coefficients, when solving inequalities?
- How can we model solutions to multi-step inequalities?

Enduring Understanding

- Expressions are powerful tools for exploring, reasoning about, and representing situations.
- Variables have many different meanings, depending on context and purpose.
- Variables permit writing expressions whose values are unknown or vary under different circumstances.
- Equations and inequalities may be used as models to solve mathematical and real-world problems.
- Real world problems may be represented by the formation and solution of linear equations.
- An inequality is another way to describe a relationship between expressions; instead of showing that the values of two expressions are equal, inequalities indicate that the value of one expression is greater than (or greater than or equal to) the value of the other expression.
- In solving an inequality, multiplying or dividing both expressions by a negative number reverses the sign that indicates the relationships between the two expressions

II. Pacing Guide

Activity	New Jersey State Learning Standards (NJSLs)	Estimated Time (Blocks)
Chapter 3 Opener	7.EE.1; 7.EE.2; 7.EE.3	1 ½
Chapter 3 Pre-Test (MIF)	7.EE.1; 7.EE.2; 7.EE.3	½
3.1- Adding Algebraic Terms	7.EE.1	2
3.2- Subtracting Algebraic Terms	7.EE.1	1
3.3- Simplifying Algebraic Expressions	7.EE.1	2
3.4- Expanding Algebraic Expressions	7.EE.1	3
3.5- Factoring Algebraic Expressions	7.EE.1	2
3.6- Writing Algebraic Expressions	7.EE.2	3
3.7- Real World Problems: Algebraic Reasoning	7.EE.3	2
Chapter 3 Wrap Up/ Review Lesson	7.EE.1; 7.EE.2; 7.EE.3	1
Chapter 3 Test (MIF) *Optional*	7.EE.1; 7.EE.2; 7.EE.3	1
Performance Task 1	7.EE.1	1
Unit 2 Review Lesson	7.EE.1; 7.EE.2;	1
Unit 2 Assessment 1	7.EE.1; 7.EE.2;	1
Chapter 4 Opener	7.EE.4; 7.EE.4a; 7.EE.4b	1 ½
Chapter 4 Pre-Test (MIF)	7.EE.4; 7.EE.4a; 7.EE.4b	½
Transition Lesson Skills 23-26	7.EE.1; 7.EE.2; 7.EE.3	2
4.1- Understanding Equivalent Equations	7.EE.4	1
4.2- Solving Algebraic Equations	7.EE.4	3
4.3- Real-World Problems: Algebraic Equations	7.EE.4a	1
Performance Task 2	7.EE.4b	1
4.4- Solving Algebraic Inequalities	7.EE.4	3
4.5- Real-World Problems: Algebraic Inequalities	7.EE.4b	1
Chapter 4 Wrap Up/ Review Lesson	7.EE.3; 7.EE.4; 7.EE.4a; 7.EE.4b	1
Chapter 4 Test (MIF) *Optional*	7.EE.3; 7.EE.4; 7.EE.4a; 7.EE.4b	1
Unit 2 Review Lesson	7.EE.3; 7.EE.4	1
Unit 2 Assessment 2	7.EE.3; 7.EE.4	1
Solidify Unit 2 Concepts / Project Based Learning	7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4	5
Total Time		45 Blocks

Major Work Supporting Content Additional Content

III. Pacing Calendar

Please complete the pacing calendar based on the suggested pacing (*see Pacing Guide*).

NOVEMBER						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

DECEMBER

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JANUARY

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

IV. NJSLA Assessment Evidence Statements

Type I

Type II

Type III

NJSLA	Evidence Statement	Clarification	Math Practices	Calculator ?
7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	i) Tasks are not limited to integer coefficients. ii) Tasks may involve issues of strategy, e.g., by providing a factored expression such as $y(3+x+k)$ and a fully expanded expression $3y + xy + ky$, and requiring students to produce or identify a new expression equivalent to both (such as $y(3+x) + yk$).	MP.7	No
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. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."	-	MP.7	No
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.	-	MP.5	Yes

7th Grade Unit 2: Expressions and Equations (MIF)

<u>7.EE.4a-1</u>	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. 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.	i) Comparison of an algebraic solution to an arithmetic solution is not assessed here; for this aspect of 7.EE.4a, see 7.C.5.	MP.1 MP.2 MP.6 MP.7	No
<u>7.EE.4a-2</u>	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Fluently solve equations of the form $px + q = r$ and $p(x+q) = r$, where p , q , and r are specific rational numbers.	i) Each task requires students to solve two equations (one of each of the given two forms). Only the answer is required. ii) Comparison of an algebraic solution to an arithmetic solution is not assessed here; for this aspect of 7.EE.4a, see 7.C.5.	MP.6 MP.7	No
<u>7.EE.4b</u>	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. 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.	i) Tasks may involve $, \leq$ or \geq .	MP.1 MP.2 MP.5 MP.6 MP.7	No
<u>7.C.1.2</u>	Base explanations/reasoning on the properties of operations. Content Scope: Knowledge and skills articulated in 7.EE.	i) Tasks should not require students to identify or name properties.	MP.3 MP.6 MP.7	Yes
<u>7.C.5</u>	Given an equation, present the solution steps as a logical argument that concludes with the set of solutions (if any). Content Scope: Knowledge and skills articulated in 7.EE.4a	-	MP.1 MP.2 MP.3 MP.6 MP.7	Yes



7th Grade Unit 2: Expressions and Equations (MIF)

<p><u>7.C.7.4</u></p>	<p>Present solutions to multi-step problems in the form of valid chains of reasoning, using symbols such as equals signs appropriately (for example, rubrics award less than full credit for the presence of nonsense statements such as $1 + 4 = 5 + 7 = 12$, even if the final answer is correct), or identify or describe errors in solutions to multi-step problems and present corrected solutions. Content Scope: Knowledge and skills articulated in 7.EE.3</p>	<p>-</p>	<p>MP.1 MP.3 MP.6 MP.7 MP.8</p>	<p>Yes</p>
<p><u>7.C.8</u></p>	<p>Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. Content Scope: Knowledge and skills articulated in 6.NS.C, 6.EE.A, 6.EE.B.</p>	<p>i) Tasks may have scaffolding 1, if necessary, in order to yield a degree of difficulty appropriate to Grade 7.</p>	<p>MP.3 MP.6</p>	<p>Yes</p>
<p><u>7.D.1</u></p>	<p>Solve multi-step contextual word problems with degree of difficulty appropriate to Grade 7, requiring application of knowledge and skills articulated in Type I, Sub-Claim A Evidence Statements.</p>	<p>i) Tasks may have scaffolding, if necessary, in order to yield a degree of difficulty appropriate to grade 7. ii) Tasks involving writing or solving an equation should not go beyond the equation types described in 7.EE.4a. ($px + q = r$ and $p(x + q) = r$ where p, q, and r are specific rational numbers.</p>	<p>MP.1 MP.2 MP.4 MP.5 MP.7</p>	<p>Yes</p>

V. Differentiated Instruction

Chapter 3

Assessment and Intervention

	ASSESSMENT	 STRUGGLING LEARNERS
DIAGNOSTIC	<ul style="list-style-type: none"> Quick Check in Recall Prior Knowledge in Student Book A, pp. 129–131 Chapter 3 Pre-Test in Assessments 	<ul style="list-style-type: none"> Skills 16–22 in <i>Transition Guide, Course 2</i>
ON-GOING	<ul style="list-style-type: none"> Guided Practice Lesson Check Ticket Out the Door 	<ul style="list-style-type: none"> Reteach worksheets Extra Practice worksheets Activity Book, Chapter 3
END-OF-CHAPTER	<ul style="list-style-type: none"> Chapter Review/Test Chapter 3 Test in Assessments  ExamView® Assessment Suite CD-ROM Course 2 	<ul style="list-style-type: none"> Reteach worksheets

ELL ENGLISH LANGUAGE LEARNERS

Review the terms *variable*, *coefficient*, *algebraic expression*, and *term*.

Model Write the expression $4 + 3x$. Point to x .

Say You can use a letter like x to stand for a quantity that can change. The letter x is called a *variable*. It stands for a number that can change. x might be 2. It might be -6 . It might be 1.5. (Point to the 3.) A number right before a variable is called a *coefficient*. A coefficient tells you how many times to multiply the variable. (Under $3x$, write “ $3 \cdot x$.”) $3x$ means “3 times x .”

Explain Contrast the expression $3x$ with the equation $3x = 12$. The expression can have infinitely many values, depending on what value of x is multiplied by 3. In the equation, only one value, 4 can be multiplied by 3 to get 12.

Say An *algebraic expression* must have one or more variables. This expression $4 + 3x$ means “4 plus 3 times a number x .” An algebraic expression is made up of *terms*. (Box the 4 and the $3x$.) This expression has two terms, 4 and $3x$, that are added together. (Circle the + sign.)

For definitions, see Glossary, page 308, and



Online Multi-Lingual Glossary.

ADVANCED LEARNERS

- Students can identify algebraic situations in their own lives or in the world around them. Encourage students to identify situations that involve two variables and two or more operations. Then have students describe each situation using words and using an algebraic expression, as shown below.

Mary’s job pays her the same amount of money each week. Last year, she also received an end-of-year bonus of \$2,000. Mary’s total pay for the year can be describes as $(52p + 2,000)$ dollars, where p represents her weekly salary.



- As needed, provide direction for students, such as suggesting that they look for situations that recur on a regular basis but include one or more values that can change. You may also point out that real-world situations that involve money, time, or distance are a good place to start.

To provide additional challenges use:

- Enrichment*, Chapter 3
- Student Book A, Brain@Work problem

Chapter 4

Assessment and Intervention

	ASSESSMENT	 STRUGGLING LEARNERS
DIAGNOSTIC	<ul style="list-style-type: none"> Quick Check in Recall Prior Knowledge in Student Book A, pp. 189–191 Chapter 4 Pre-Test in Assessments 	<ul style="list-style-type: none"> Skills 23–26 in <i>Transition Guide, Course 2</i>
ON-GOING	<ul style="list-style-type: none"> Guided Practice Lesson Check Ticket Out the Door 	<ul style="list-style-type: none"> Reteach worksheets Extra Practice worksheets Activity Book, Chapter 4
END-OF-CHAPTER	<ul style="list-style-type: none"> Chapter Review/Test Chapter 4 Test in Assessments  ExamView® Assessment Suite CD-ROM Course 2 	<ul style="list-style-type: none"> Reteach worksheets

ENGLISH LANGUAGE LEARNERS

Review the terms *expression*, *equation*, and *inequality*.

Model Write the expression $2y + 3$. Next to it, write the equation $2y + 3 = 8$. Next to that, write the inequality $2y + 3 > 4$. Then, write the symbols \neq , $>$, $<$, \geq , and \leq .

Say $2y + 3$ is an algebraic *expression*. It includes the letter y , a variable, to stand for a value you do not know.

Say $2y + 3 = 8$ is an *equation*. An equation has an equal sign. This equation tells you that the expression $2y + 3$ is equal to 8. $2y + 3$ has the same value as 8.

Say $2y + 3 > 4$ is an *inequality*. An inequality has an inequality sign. An inequality tells you that two numbers or expressions may not be equal. They may not have the same value. This inequality tells you that $2y + 3$ is greater than 4. There are five different inequality symbols. (Review the meaning of each symbol.)

For definitions, see Glossary, page 308, and



Online Multi-Lingual Glossary.

ADVANCED LEARNERS

- Tell students that performing identical operations on both sides of an equation or inequality does not always produce an equivalent statement.
- Challenge students to identify a real number for which this is the case. Ask students to explain for each of the four operations with the number whether the result is an equivalent statement, as well as whether it is a true statement. (*Addition or subtraction of 0 results in the equation or inequality being unchanged, so the statements are identical, rather than equivalent, and true. Multiplication by 0 results in an equation or inequality that is not equivalent. The new equation is a true statement, but the new inequality may not be a true statement. Division by zero is undefined, so the result can be neither true nor equivalent.*)

To provide additional challenges use:

- Enrichment, Chapter 4
- Student Book A, Brain@Work problem

VI. Vocabulary

Term	Definition
Chapter 3	
No new terminology in Chapter 3	
Chapter 4	
<i>equivalent equations</i>	Algebraic equations with the same solution.
<i>equivalent inequalities</i>	Algebraic inequalities with the same solution set.
<i>solution set</i>	A set of values that make an inequality true
<i>Terminating Decimal</i>	A decimal that has a finite number of nonzero decimal places. Examples: 0.5, 0.28, and 0.75 are terminating decimals

VII. Assessment Framework

Unit 2 Assessment Framework				
Assessment	NJSLS	Estimated Time	Format	Graded ?
Chapter 3 Pretest (Beginning of Unit) <i>Math in Focus</i>	7.EE.1; 7.EE.2; 7.EE.3	½ Block	Individual	Yes (No Weight)
Chapter 4 Pretest (After Chapter 3) <i>Math in Focus</i>	7.EE.4; 7.EE.4a; 7.EE.4b	½ Block	Individual	Yes (No Weight)
Unit 2 Assessment 1 (After Chapter 3) <i>District Assessment</i>	7.EE.1; 7.EE.2;	½ Block	Individual	Yes
Unit 2 Assessment 2 (Conclusion of Unit) <i>District Assessment</i>	7.EE.3; 7.EE.4	½ Block	Individual	Yes
Chapter 3 Test (Optional) <i>Math in Focus</i>	7.EE.1; 7.EE.2; 7.EE.3	½ Block	Individual	Yes, if administered
Chapter 4 Test (Optional) <i>Math in Focus</i>	7.EE.4; 7.EE.4a; 7.EE.4b	½ Block	Individual	Yes, if administered
Grade 7 Interim Assessment 2 (Mid-January) <i>District Assessment</i>	7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4	1 Block	Individual	Yes

Unit 2 Performance Assessment Framework				
Assessment	NJSLS	Estimated Time	Format	Graded ?
Unit 2 Performance Task 1 (Mid-December) <i>Miles to Kilometers</i>	7.EE.A.1	1 Block	Individual	Yes; Rubric
Unit 2 Performance Task 2 (Mid-January) <i>Fishing Adventures</i>	7.EE.B.4	1 Block	Individual w/ Interview Opportunity	Yes; Rubric
Extended Constructed Response (ECR)* (click here for access)	Dependent on unit of study & month of administration	Up to 30 minutes	Individual	Yes; Rubric

* Use the following links to access ECR protocol and district assessment scoring documents:

- [Assessment & Data in Mathematics Bulletin](#)
- [Extended Constructed Response Protocol](#)

7th Grade Portfolio Assessment: Unit 2 Performance Task 1

Name _____

Block _____

Date _____

Miles to Kilometers (NJSLS 7.EE.A.1)

The students in Mr. Sanchez's class are converting distances measured in miles to kilometers. To estimate the number of kilometers, Abby takes the number of miles, doubles it, and then subtracts 20% of the result. Renato first divides the number of miles by 5, and then multiplies the result by 8.

a. Write an algebraic expression for each method.

b. Use your answer to part (a) to decide if the two methods give the same answer. Explain your work.

<p>Task Description</p>	<ul style="list-style-type: none"> • Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams. • Clearly constructs and communicates a complete response by <ul style="list-style-type: none"> ➤ using a logical approach based on a conjecture and/or stated assumptions ➤ providing an efficient and logical progression of steps ➤ using grade-level vocabulary, symbols, and labels ➤ providing a justification of a conclusion with minor computational error ➤ evaluating, interpreting and critiquing the validity and efficiency of others’ responses 				
<p>Command Level Description</p>	<p>Level 5: <i>Distinguished Command</i></p> <p>Perform the task items accurately or with minor computation errors.</p>	<p>Level 4: <i>Strong Command</i></p> <p>Perform the task items with some non-conceptual errors</p>	<p>Level 3: <i>Moderate Command</i></p> <p>Perform the task items with minor conceptual errors and some computation errors.</p>	<p>Level 2: <i>Partial Command</i></p> <p>Perform the task items with some errors on both math concept and computation.</p>	<p>Level 1: <i>No Command</i></p> <p>Perform the task items with serious errors on both math concept and computation.</p>
<p>Score range</p>	<p>5 pts</p>	<p>4 pts</p>	<p>3 pts</p>	<p>2 pts</p>	<p>0-1 pt</p>
<p>Task Score & PLD Assigned</p>					

#	Answer	Scoring
Part A	<p>**** Solutions may vary ***</p> <p>Abby's method starts doubling m, giving $2m$. She then takes 20% of the result, which we can write $0.2(2m)$. Finally she subtracts this from $2m$, giving $2m - (0.2)2m$.</p> <p>Renato's method starts by dividing m by 5, giving $m \div 5 = \frac{m}{5}$, and then multiplies the result by 8, giving</p> $8 \left(\frac{m}{5} \right)$	<p>2 points: 1 point for each correct expression.</p> <p>2 TOTAL POINTS</p>
Part B	<p>Abby's expression can be simplified as follows:</p> $2m - (0.2)2m = 2m - 0.4m = (2 - 0.4)m = 1.6m.$ <p>(The step where we rewrite $2m - 0.4m$ as $(2 - 0.4)$ uses the distributive property.)</p> <p>Renato's method gives</p> $8 \cdot \frac{m}{5} = 8 \cdot \frac{1}{5} \cdot m = \frac{8}{5} \cdot m = 1.6m.$ <p>So the two methods give the same answer and the expressions are equivalent.</p>	<p>2 points: for the correctly simplifying Abby's and Renato's expression. OR 1 point: for correctly simplifying Abby's and Renato's expression with minor mistakes.</p> <p>1 point for correct explanation.</p> <p>3 TOTAL POINTS</p>

7th Grade Portfolio Assessment: Unit 2 Performance Task 2

Name _____

Block _____

Date _____

Fishing Adventures (7.EE.B.4)

Fishing Adventures rents small fishing boats to tourists for day long fishing trips. Each boat can only carry 1200 pounds of people and gear for safety reasons. Assume the average weight of a person is 150 pounds. Each group will require 200 lbs of gear for the boat plus 10 lbs of gear for each person.

- a. Several groups of people wish to rent a boat.

Group 1 has 4 people

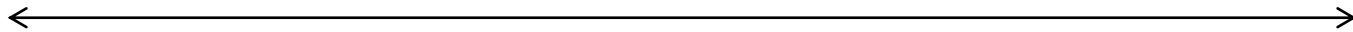
Group 2 has 5 people

Group 3 has 8 people

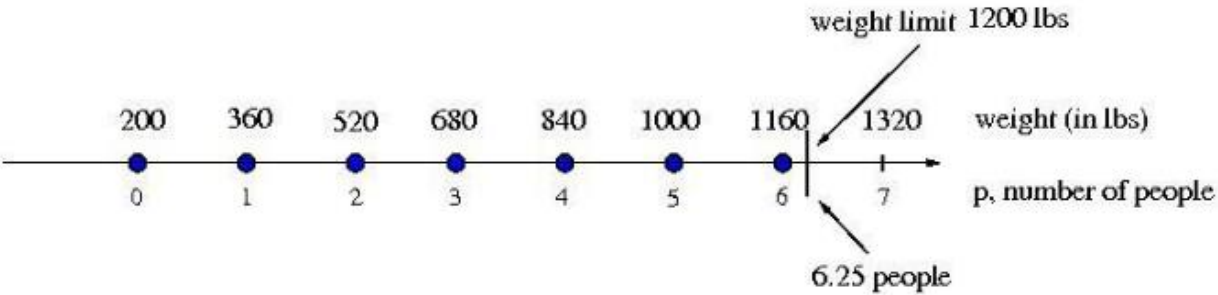
Which of the groups, if any, can safely rent a boat? Justify your answer algebraically.

7th Grade Unit 2: Expressions and Equations (MIF)

- b. Create an inequality describing the restrictions on the number of people possible in a rented boat. Graph the solution set.



<p>Task Description</p>	<ul style="list-style-type: none"> • Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams. • Clearly constructs and communicates a complete response by <ul style="list-style-type: none"> ➤ using a logical approach based on a conjecture and/or stated assumptions ➤ providing an efficient and logical progression of steps ➤ using grade-level vocabulary, symbols, and labels ➤ providing a justification of a conclusion with minor computational error ➤ evaluating, interpreting and critiquing the validity and efficiency of others' responses 				
<p>Command Level Description</p>	<p>Level 5: <i>Distinguished Command</i></p> <p>Perform the task items accurately or with minor computation errors.</p>	<p>Level 4: <i>Strong Command</i></p> <p>Perform the task items with some non-conceptual errors</p>	<p>Level 3: <i>Moderate Command</i></p> <p>Perform the task items with minor conceptual errors and some computation errors.</p>	<p>Level 2: <i>Partial Command</i></p> <p>Perform the task items with some errors on both math concept and computation.</p>	<p>Level 1: <i>No Command</i></p> <p>Perform the task items with serious errors on both math concept and computation.</p>
<p>Score range</p>	<p><i>11-12 pts</i></p>	<p><i>8-10 pts</i></p>	<p><i>6-7 pts</i></p>	<p><i>3-5 pts</i></p>	<p><i>0-2 pts</i></p>
<p>Task Score & PLD Assigned</p>					

#	Answer	Scoring
Part A	<p>For Group 1 : $160(4) + 200 = 840 \leq 1200$</p> <p>For Group 2 : $160(5) + 200 = 1000 \leq 1200$</p> <p>For Group 3 : $160(8) + 200 = 1480 \not\leq 1200$</p>	<p>2 points: for each group (1 point for correctly saying if they will arrive safely and 1 point for algebraic justification) (6 points possible)</p> <p style="text-align: center;">6 TOTAL POINTS</p>
Part B	<ul style="list-style-type: none"> • P= the number of people • $160p + 200 \leq 1200$ • Graph 	<p>1 point for correctly defining their own variables</p> <p><i>Inequality</i></p> <ul style="list-style-type: none"> • 3 points: Correct inequality (or something equivalent) • 2 points: Students disregards the extra 10 lbs per person OR the extra 200 pounds per group OR uses “<” instead of “<=” (ex: $150p \leq 1000$; $160p \leq 1200$; $160p < 1000$) • 1 point: Students disregard the extra 10 lbs per person AND the extra 200 lbs per group AND/OR uses “<” instead of “<=” (ex: $150p < 1000$; $160p \leq 1200$; $160p < 1200$) <p><i>Graph</i></p> <ul style="list-style-type: none"> • 2 points: correct intervals and solution shading; • 1 point: student uses “<” instead of “<=” <p style="text-align: center;">6 TOTAL POINTS</p>

IX. Modifications

Special Education/ 504:	English Language Learners:
<ul style="list-style-type: none"> -Adhere to all modifications and health concerns stated in each IEP. -Give students a MENU options, allowing students to pick assignments from different levels based on difficulty. -Accommodate Instructional Strategies: reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), handouts, definition list with visuals, extended time -Allow students to demonstrate understanding of a problem by drawing the picture of the answer and then explaining the reasoning orally and/or writing , such as Read-Draw-Write -Provide breaks between tasks, use positive reinforcement, use proximity -Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum by using manipulatives -Implement supports for students with disabilities (click here) - Make use of strategies imbedded within lessons -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 17-18) - Strategies for students with 504 plans 	<ul style="list-style-type: none"> - Use manipulatives to promote conceptual understanding and enhance vocabulary usage - Provide graphic representations, gestures, drawings, equations, realia, and pictures during all segments of instruction - During i-Ready lessons, click on “Español” to hear specific words in Spanish - Utilize graphic organizers which are concrete, pictorial ways of constructing knowledge and organizing information - Use sentence frames and questioning strategies so that students will explain their thinking/ process of how to solve word problems - Utilize program translations (if available) for L1/ L2 students - Reword questions in simpler language - Make use of the ELL Mathematical Language Routines (click here for additional information) -Scaffolding instruction for ELL Learners -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 16-17)
Gifted and Talented:	Students at Risk for Failure:
<ul style="list-style-type: none"> - Elevated contextual complexity - Inquiry based or open ended assignments and projects - More time to study concepts with greater depth - Promote the synthesis of concepts and making real world connections - Provide students with enrichment practice that are imbedded in the curriculum such as: <ul style="list-style-type: none"> ● Application / Conceptual Development ● Are you ready for more? - Provide opportunities for math competitions - Alternative instruction pathways available - Common Core Approach to Differentiate Instruction: Students with Disabilities (pg. 20) 	<ul style="list-style-type: none"> - Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum - Modify Instructional Strategies, reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), inclusion of more visuals and manipulatives, Peer Support - Constant parental/ guardian contact - Provide academic contracts to students & guardians - Create an interactive notebook with samples, key vocabulary words, student goals/ objectives. - Plan to address students at risk in your learning tasks, instructions, and directions. Anticipate where the needs will be, then address them prior to lessons. -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 19)

21st Century Life and Career Skills:

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

<https://www.state.nj.us/education/cccs/2014/career/9.pdf>

- | | |
|--|--|
| <ul style="list-style-type: none">● CRP1. Act as a responsible and contributing citizen and employee.● CRP2. Apply appropriate academic and technical skills.● CRP3. Attend to personal health and financial well-being.● CRP4. Communicate clearly and effectively and with reason.● CRP5. Consider the environmental, social and economic impacts of decisions.● CRP6. Demonstrate creativity and innovation. | <ul style="list-style-type: none">● CRP7. Employ valid and reliable research strategies.● CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.● CRP9. Model integrity, ethical leadership and effective management.● CRP10. Plan education and career paths aligned to personal goals.● CRP11. Use technology to enhance productivity.● CRP12. Work productively in teams while using cultural global competence. |
|--|--|

Students are given an opportunity to communicate with peers effectively, clearly, and with the use of technical language. They are encouraged to reason through experiences that promote critical thinking and emphasize the importance of perseverance. Students are exposed to various mediums of technology, such as digital learning, calculators, and educational websites.

Technology Standards:

All students will be prepared to meet the challenge of a dynamic global society in which they participate, contribute, achieve, and flourish through universal access to people, information, and ideas.

<https://www.state.nj.us/education/cccs/2014/tech/>

8.1 Educational Technology:

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

- A. **Technology Operations and Concepts:** Students demonstrate a sound understanding of technology concepts, systems and operations.
- B. **Creativity and Innovation:** Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
- C. **Communication and Collaboration:** Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
- D. **Digital Citizenship:** Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- E. **Research and Information Fluency:** Students apply digital tools to gather, evaluate, and use of information.
- F. **Critical thinking, problem solving, and decision making:** Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

- A. **The Nature of Technology: Creativity and Innovation-** Technology systems impact every aspect of the world in which we live.
- B. **Technology and Society:** Knowledge and understanding of human, cultural, and societal values are fundamental when designing technological systems and products in the global society.
- C. **Design:** The design process is a systematic approach to solving problems.
- D. **Abilities in a Technological World:** The designed world in a product of a design process that provides the means to convert resources into products and systems.
- E. **Computational Thinking: Programming-** Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Connections:

English Language Arts:

L.7.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
SL.7.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
W.7.1	Write arguments to support claims with clear reasons and relevant evidence.

X. Core Instruction & Supplemental Resources

Core Instruction

MATH IN FOCUS v. 2015
(HOUGHTON MIFFLIN HARCOURT)

GRADE	TEACHER RESOURCES	STUDENT RESOURCES
2-5	<ul style="list-style-type: none">• Teacher Edition (A & B)• Implementation Guide• Assessment Package• Enrichment Bundle• Extra Practice Guide• Transition Guides• Reteaching Guide• Home -to- School Connection Book• Online Teacher Technology Kit• Fact Fluency• Online Interactive Whiteboard Lessons	<ul style="list-style-type: none">• Student Texts (A & B)• Student Workbooks• Online Student Technology Kit• Student Interactivities
6-7	<ul style="list-style-type: none">• Teacher Edition (A & B)• Implementation Guide• Assessment Package• Enrichment Bundle• Extra Practice Guide• Transition Guides• Reteaching Guide• Home -to- School Connection Book• Online Teacher Technology Kit	<ul style="list-style-type: none">• Student Texts (A & B)• Online Student Interactive Manipulatives

5 Practices for Orchestrating Productive Mathematics Discussions

Anticipate

Consider how students might mathematically interpret a problem, the array of strategies—both correct and incorrect—that they might use to tackle it, and how those strategies and interpretations might relate to the mathematical concepts, representations, procedures, and practices that you would like the students to learn.

- Solve the problem yourself first. If possible work with colleagues.
- Ask yourself the following questions:
 - What strategies have students used in the past?
 - What representations are students most likely to use?
 - What incorrect or unproductive strategies are students likely to try?
 - What things might get in the way of students being able to engage with the problem? How can you remove those barriers?
 - What questions will you ask those who struggle?

Monitor

Pay close attention to students' mathematical thinking and solution strategies as they work on the task.

- Create a list of strategies the students may produce.
- Circulate the room. Watch and listen to students as they work.
- If any students use strategies you anticipated, write their name or group number on your list.
- Ask questions that will help students make their thinking visible.
- Ask questions that will help students clarify their thinking.
- Press students to consider aspects of the task to which they need to attend.

Select

Select particular students to share their work with the rest of the class to get specific mathematics into the open for discussion. The selection of particular students and their solutions is guided by the previously anticipated strategies and your assessment of how each approach will contribute to that goal.

- Based on the previously anticipated strategies and the mathematical goal of the activity, decide which student strategies to highlight.
- Select students who will share their work with the class.

Sequence

Make purposeful choices about the order in which students' work is shared to maximize the chances of achieving the mathematical goals for the discussion.

- Based on the mathematical goal, decide on the purpose for the sequence of work. For example: least efficient to most efficient, concrete to abstract, misconceptions to conceptions, or building representations.
- Decide in which order students will present their work.

Connect

Help students draw connections between their solutions and other students' solutions as well as the key mathematical ideas in the lesson. Help students to make judgments about the consequences of different approaches for the range of problems that can be solved, one's likely accuracy and efficiency in solving them, and the kinds of mathematical patterns that can be most easily discerned. Know where you want the discussion to "land" and make choices that are likely to get you there. If necessary, you may have to demonstrate an approach that students didn't come up with themselves.

- As students share, ask questions to elicit and clarify student thinking.
- After each student shares, ask questions to connect it to previously shared work or ask a student to summarize what another student said in their own words.
- Ask students to compare and contrast strategies or representations during the discussion.
- If students did not come up with an approach that you need them to see in order for the discussion to "land," demonstrate this approach and connect it to the work that students did.

IDEAL MATH BLOCK				
Whole Group Instruction	55min	<p>INSTRUCTION (Grades 3 – 8) Daily Routine: Mathematical Content or Language Routine (7 – 10 min)</p> <p>Anchor Task: Anticipate, Monitor, Select, Sequence, Connect Tech Integration: Digital applets embedded within lessons designed to enhance student learning</p> <p>Collaborative Work* Guided Learning/Guided Practice</p> <p>Independent Work (Demonstration of Student Thinking) Additional Activities / Let's Practice</p>		
Rotation Stations (Student Notebooks & Chromebooks Needed)	1-2X 30 min	<p>STATION 1: Focus on current Grade Level Content</p> <p>STUDENT EXPLORATION* Independent or groups of 2-3 Emphasis on MP's 3, 6 (Reasoning and Precision) And MP's 1 & 4 (Problem Solving and Application)</p> <p>TOOLS/RESOURCES Practice Problems Extra Practice/Enrichment Are you ready for more? Put Your Thinking Cap On</p>	<p>STATION 2: Focus on Student Needs</p> <p>TECH STATION Independent</p> <p>TECH INTEGRATION iReady - <i>i-Ready</i> delivers online lessons driven by student data to provide tailored instruction that meets students where they are in their learning trajectory.</p> <p>Dreambox (ELL) – Adaptive online learning platform.</p>	<p>TEACHER STATION: Focus on Grade Level Content; heavily scaffolded to connect deficiencies</p> <p>TARGETED INSTRUCTION 4 – 5 Students</p> <p>TOOLS/ RESOURCES Homework Manipulatives Reteach Workbook Transition Guide *all students seen in 2 weeks</p>
Closure	5 min	<p>INSTRUCTION Exit Ticket (Demonstration of Student Thinking)</p> <p>TOOLS/RESOURCES Notebooks or Exit Ticket Slips</p>		

* Promotes discourse and collaboration



Supplemental Resources

Achieve the Core

Tasks - <https://achievethecore.org/category/416/mathematics-tasks>

Coherence Map - <https://achievethecore.org/page/1118/coherence-map>

Embarc

<https://embarc.online/>

Engage NY

https://www.engageny.org/ccss-library/?f%5B0%5D=field_subject%253Aparents_all%3A13601

iReady Digital Platform

<https://login.i-ready.com/>

Math in Focus

<https://my.hrw.com/>

Illustrative Mathematics

Content Standard Tasks - <https://tasks.illustrativemathematics.org/content-standards>

Practice Standard Tasks - <https://tasks.illustrativemathematics.org/practice-standards>

Open Up Resources - https://access.openupresources.org/sign_in

iM Additional Resources - <https://bit.ly/imshare>

Khan Academy

<https://www.khanacademy.org/math/illustrative-math>

NJDOE Digital Item Library

<https://nj.digitalitemlibrary.com/home?subject=Math>

Ready Teacher Toolbox

<https://teacher-toolbox.com/>