Orange Public Schools

Office of Curriculum & Instruction
2019-2020 Mathematics Curriculum Guide

7th Grade Mathematics (Accelerated)

Illustrative Mathematics - Unit 5: Expressions, Equations, and Inequalities

December 13, 2019 – January 22, 2020

Board Approved: 1.14.2020

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From the New Jersey State Learning Standards:

Traditional Pathway Accelerated 7th Grade

In **Accelerated 7th Grade,** instructional time should focus on four critical areas: (1) Rational Numbers and Exponents; (2) Proportionality and Linear Relationships; (3) Introduction to Sampling Inference; (4) Creating, Comparing, and Analyzing Geometric Figures

1. 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. They extend their mastery of the properties of operations to develop an understanding of integer exponents, and to work with numbers written in scientific notation.

2. Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y= mx + b$), understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x-coordinate changes by an amount A, the output or y-coordinate changes by the amount $m \times A$. Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation.

3. 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

4. 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, 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. Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.

Yearlong Pacing Guide
Accelerated 7

Grade	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
6	Unit 1 6.G		Unit 2 6.RP	Unit 3 6.RP	Unit 4 6.NS		Unit 5 6.NS	Unit 6 6.EE	Unit 7 6.NS	Unit 8 6.SP
Acc 7	Unit 1 7.RP	Unit 2 7.G	Unit 3 7.RP	Unit 4 7.NS	Unit 5 7.EE	Unit 6 7.G	Unit 7 8.G	Unit 8 8.G	Unit 9 8.EE	Unit 10 8.EE	Unit 11 7.SP

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
7.RP: Scale Drawings & Proportional Relationships	**7.G:** Measuring Circles	**7.RP:** Proportional Relationships & Percentages	**7.NS:** Rational Number Arithmetic	**7.EE:** Expressions, Equations, & Inequalities

Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11
7.G: Angles, Triangles and Prisms	**8.G:** Rigid Transformations & Congruence	**8.G.** Dilations, Similarity, and Introducing Slope	**8.EE:** Linear Relationships	**8.EE:** Exponents and Scientific Notation	**7.SP:** Probability & Sampling

2019-2020 Accelerated Grade 7 (iM)										
Quarter 1			**Quarter 2**			**Quarter 3**			**Quarter 4**	
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11
iM 7.1 iM 7.2	iM 7.3	iM 7.4	iM 7.5	iM 7.6	iM 7.7	iM 8.1	iM 8.2	iM 8.3	iM 8.7	iM 7.8
7.G.1(A) 7.RP.2a(M) 7.RP.2b(M) 7.RP.2c(M) 7.RP.2d(M)	7.G.4(A)	7.RP.1(M) 7.RP.3(M)	7.NS.1(M) 7.NS.2(M) 7.NS.3(M)	7.EE.3(M) 7.EE.4(M) 7.EE.2(M) 7.EE.1(M)	7.G.5(A) 7.G.2(A) 7.G.3(A) 7.G.6(A)	8.G.1(M) 8.G.2(M) 8.G.5(M)	8.G.4(M) 8.G.3(M) 8.EE.6(M)	8.EE.5(M) 8.F.4(S) 8.EE.8(M)	8.EE.1(M) 8.EE.3(M) 8.EE.4(M)	7.SP.6(S) 7.SP.5(S) 7.SP.7(S) 7.SP.8(S) 7.SP.1(S) 7.SP.2(S) 7.SP.3(S) 7.SP.4(S)
20 Days	8 Days	11 Days	14 Days	18 Days	12 Days	13 Days	12 Days	12 Days	11 Days	15 Days
Oct. 9	Oct. 24	Nov. 15	Dec. 12	Jan. 22	Feb. 12	Mar. 11	Apr. 1	Apr. 29	May. 18	June 11

Major Work Supporting Content Additional Content

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References

"Illustrative Mathematics" *Open Up Resources.* 2018 <https://auth.openupresources.org/register/complete>

I. Unit Overview

In this unit, students solve equations of the forms $px+q=r$ and $p(x+q)=r$, and solve related inequalities, e.g., those of the form $px+q>r$ and $px+q\geq r$, where p, q, and r are rational numbers.

In the first section of the unit, students represent relationships of two quantities with tape diagrams and with equations, and explain correspondences between the two types of representations (MP1). They begin by examining correspondences between descriptions of situations and tape diagrams, then draw tape diagrams to represent situations in which the variable representing the unknown is specified. Next, they examine correspondences between equations and tape diagrams, then draw tape diagrams to represent equations, noticing that one tape diagram can be described by different (but related) equations. At the end of the section, they draw tape diagrams to represent situations in which the variable representing the unknown is not specified, then match the diagrams with equations.

In the second section of the unit, students solve equations of the forms $px+q=r$ and $p(x+q)=r$, then solve problems that can be represented by such equations (MP2). They begin by considering balanced and unbalanced "hanger diagrams," matching hanger diagrams with equations, and using the diagrams to understand two algebraic steps in solving equations of the form $px+q=r$: subtract the same number from both sides, then divide both sides by the same number. Like a tape diagram, the same balanced hanger diagram can be described by different (but related) equations, e.g., $3x+6=18$ and $3(x+2)=18$. The second form suggests using the same two algebraic steps to solve the equation, but in reverse order: divide both sides by the same number, then subtract the same number from both sides.

So far, the situations in the section have been described by equations in which p is a whole number and q and r are positive (and frequently whole numbers). In the remainder of the section, students use the algebraic methods that they have learned to solve equations of the forms $px+q=r$ and $p(x+q)=r$ in which p, q, and r are rational numbers. They use the distributive property to transform an equation of one form into the other (MP7) and note how such transformations can be used strategically in solving an equation (MP5). They write equations in order to solve problems involving percent increase and decrease (MP2).

In the third section of the unit, students work with inequalities. They begin by examining values that make an inequality true or false, and using the number line to represent values that make an inequality true. They solve equations, examine values to the left and right of a solution, and use those values in considering the solution of a related inequality. In the last two lessons of the section, students solve inequalities that represent real-world situations (MP2).

In the last section of the unit, students work with equivalent linear expressions, using properties of operations to explain equivalence (MP3). They represent expressions with area diagrams, and use the distributive property to justify factoring or expanding an expression.

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)
Lesson 1: Reasoning about Contexts with Tape Diagrams	7.EE.B.4	1
Lesson 2: Reasoning about Contexts with Tape Diagrams	7.EE.B.3	1
Lesson 3: Representing Situations with Tape Diagrams and Equations	7.EE.B.3, 7.EE.B.4, 7.EE.B.4.a	1
Lesson 4: Distinguishing between Two Types of Situations	7.EE.B.3, 7.EE.B.4, 7.EE.B.4.a	1
Lesson 5: Reasoning about Solving Equations With Balanced Hangers	7.EE.B.4.a	1
Lesson 6: Dealing with Negative Numbers in Equations	7.EE.B.4, 7.EE.B.4.a	1
Lesson 7: Different Options for Solving One Equation	7.EE.B.4.a	1
Lesson 8: Solving Problems 1	7.EE.B.3, 7.EE.B.4, 7.EE.B.4.a	1
Lesson 9: Solving Problems 2	7.EE.A.2, 7.EE.B.3, 7.EE.B.4, 7.EE.B.4.a	1
Lesson 10: Comparing Solutions to Equations and Inequalities	7.EE.B.4, 7.EE.B.4.b	1
Lesson 11: Inequalities with Negatives	7.EE.B.4, 7.EE.B.4.b	1
Lesson 12: Which Side Are the Solutions?	7.EE.B.4, 7.EE.B.4.b	1
Lesson 13: Solving Problems with Inequalities (choose among these)	7.EE.B.4.b	1
Lesson 14: Expanding and Factoring	7.EE.A.1	1
Lesson 15: Combining Like Terms	7.EE.A.1	1
Lesson 16: Combining Like Terms	7.EE.A.1	1
Unit 5 Performance Task *(Project Based Learning)*	7.EE.B.4	**½**
Accelerated Grade 7 Interim Assessment 3	7.RP.1, 7.RP.3-1, 7.RP.3-2	**1**
Total Time		**17½ Blocks**

Major Work Supporting Content Additional Content

III. Scope & Sequence

Accelerated Unit Lesson	Accelerated Lesson Name	Original Unit Lesson	Activity Name
5.1	Reasoning About Contexts with Tape Diagrams	7.6.2	Remembering Tape Diagrams
		7.6.2	Every Picture Tells a Story
		7.6.2	Every Story Needs a Picture
		7.6.2	Red and Yellow Apples
5.2	Reasoning About Equations and Tape Diagrams	7.6.3	Find Equivalent Expressions
		7.6.3	Matching Equations to Tape Diagrams
		7.6.3	Drawing Tape Diagrams to Represent Equations
		7.6.3	Three of These Equations Belong Together
5.3	Representing Situations with Tape Diagrams and Equations	7.6.4	Algebra Talk: Seeing Structure
		7.6.5	Algebra Talk: Seeing More Structure
		7.6.4	Situations and Diagrams
		7.6.4	Situations, Diagrams, and Equations
		7.6.5	More Situations and Diagrams
		7.6.5	More Situations, Diagrams, and Equations
5.4	Distinguishing Between Two Types of Situations	7.6.4	Finding Solutions
		7.6.5	More Finding Solutions
		7.6.6	Even More Situations, Diagrams, and Equations
		7.6.6	After School Tutoring
5.5	Reasoning About Solving Equations With Balanced Hangers	7.6.7	Hanger Diagrams
		7.6.7	Hanger and Equation Matching
		7.6.7	Use Hangers to Understand Equation Solving
		7.6.8	Either Or
		7.6.8	Use Hangers to Understand Equation Solving, Again
		7.6.7	Solve the Equation
		7.6.8	Solve Another Equation
5.6	Dealing With Negative Numbers in Equations	7.6.9	Which One Doesn't Belong: Rational Number Arithmetic
		7.6.9	Old and New Ways to Solve
		7.6.9	Keeping It True
		7.6.9	Solve Two More Equations
5.7	Different Options for Solving One Equation	7.6.10	Algebra Talk: Solve Each Equation
		7.6.10	Analyzing Solution Methods
		7.6.10	Solution Pathways
		7.6.10	Solve Two Equations
5.8	Solving Problems 1	7.5.12	Remember Tape Diagrams
		7.5.12	At the Fair
		7.5.12	Running Around
		7.5.12	The Basketball Game
5.9	Solving Problems 2	7.6.12	20% Off
		7.6.12	Walking More Each Day
		7.6.12	A Sale on Shoes
		7.6.12	Timing the Relay Race

5.10	Comparing Solutions to Equations and Inequalities	7.6.13	Is the Inequality True or False?
		7.6.13	Some Values, All Values
		7.6.14	Solutions to Equations and Solutions to Inequalities
		7.6.14	Earning Money for Soccer Stuff
5.11	Inequalities with Negatives	7.6.14	Granola Bars and Savings
		7.6.14	Colder and colder
		7.6.15	Lots of Negatives
		7.6.15	Inequalities with Tables
5.12	Which Side Are the Solutions?	7.6.15	Which Side are the Solutions?
		7.6.15	Testing for Solutions
		7.6.16	Solve Some Inequalities!
		7.6.16	Club Activities Matching
5.13	Solving Problems with Inequalities (choose among these)	7.6.16	Club Activities Display
		7.6.16	Party Decorations
		7.6.17	Possible Values
		7.6.17	Elevator
		7.6.17	Giving Advice
		7.6.17	Movies on a Hard Drive
5.14	Expanding and Factoring	7.6.18	Organizing Work
		7.6.19	Factoring and Expanding with Negative Numbers
		7.6.19	Equivalent Expressions
5.15	Combining Like Terms	7.6.20	A's and B's
		7.6.20	Making Sides Equal
		7.6.21	Seeing it Differently
		7.6.21	Grouping Differently
5.16	Combining Like Terms	7.6.21	How Many are Equivalent?
		7.6.22	X's and Y's
		7.6.22	Seeing Structure and Factoring
		7.6.22	R’s and T’s

IV. Pacing Calendar

Please complete the pacing calendar based on the suggested pacing (*see Pacing Guide on page 2)*.

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**				

Please complete the pacing calendar based on the suggested pacing (*see Pacing Guide on page 2)*.

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**				

V. NJSLA Assessment Evidence Statements

Type I Type II Type III

NJSLS	Evidence Statement	Clarification	Math Practices	Calculator ?
7.NS.1a	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.	-	MP.5	No
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	-	MP. 5	Yes

	mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 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 3/4 inches long in the center of a door that is 27 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.			
7.EE.4a-1	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
7.EE.4a-2	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
7.EE.4b	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 ≤ or ≥.	MP. 1 MP. 2 MP. 5 MP. 6 MP. 7	No
7.C.1.1	Base explanations/reasoning on the properties of operations. Content Scope: Knowledge and skills	i) Tasks should not require students to identify or name properties.	MP. 1 MP. 2 MP. 3	Yes

	articulated in 7.NS.1 and 7.NS.2		MP. 5 MP. 6 MP. 7	
7.C.1.2	Base explanations/reasoning on the properties of operations. Content Scope: Knowledge and skills articulated in 7.EE.1	i) Tasks should not require students to identify or name properties.	MP. 3 MP. 6 MP. 7	Yes
7.C.2	Base explanations/reasoning on the relationship between addition and subtraction or the relationship between multiplication and division. Content Scope: Knowledge and skills articulated in 7.NS.1 and 7.NS.2	-	MP. 1 MP. 2 MP. 3 MP. 5 MP. 6 MP. 7	Yes
7.C.3	Base explanations/reasoning on a number line diagram (whether provided in the prompt or constructed by the student in her response). Content Scope: Knowledge and skills articulated in 7.NS.A	-	MP. 1 MP. 2 MP. 3 MP. 5 MP. 6 MP. 7	Yes
7.C.5	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
7.C.7.4	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	-	MP. 1 MP. 3 MP. 6 MP. 7 MP. 8	Yes
7.D.1	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.	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	MP.1 MP.2 MP.4 MP.5 MP.7	Yes

		in 7.EE.4a. ($px + q = r$ and $p(x + q) = r$ where p, q, and r are specific rational number		

VI. Differentiated Instruction

Supporting English Language Learners

The purpose of this document is to nudge the field forward by offering support to the next generation of mathematics learners and by challenging persistent assumptions about how to support and develop students' disciplinary language. The goal is to provide guidance to mathematics teachers for recognizing and supporting students' language development processes in the context of mathematical sense making. UL/SCALE provides a framework for organizing strategies and special considerations to support students in learning mathematics practices, content, and language. The framework is intended to help teachers address the specialized academic language demands in math when planning and delivering lessons, including the demands of reading, writing, speaking, listening, conversing, and representing in math (Aguirre & Bunch, 2012). Therefore, while the framework can and should be used to support all students learning mathematics, it is particularly well-suited to meet the needs of linguistically and culturally diverse students who are simultaneously learning mathematics while acquiring English.

For more information, click the link below:

Supporting ELL Learners

Supporting Students with Disabilities

The philosophical stance that guided the creation of these materials is the belief that with proper structures, accommodations, and supports, all children can learn mathematics. Lessons are designed to maximize access for all students and include additional suggested supports to meet the varying needs of individual students. While the suggested supports are designed for students with disabilities, they are also appropriate for many children who struggle to access rigorous, grade-level content. Teachers should use their professional judgment about which supports to use and when, based on their knowledge of the individual needs of students in their classroom.

For more information, click the link below:

Supporting Students with Disabilities

VI. Vocabulary

New vocabulary terms are not introduced within Unit 6.

VII. Assessment Framework

Unit 5 Assessment Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Pre-Unit Diagnostic Assessment (Beginning of Unit – Optional) *Illustrative Mathematics*	6.EE.B.7, 7.EE.B.4, 6.EE.B.8, 6.EE.B.5, 7.NS.A.1, 7.NS.A.2, 6.EE.A.3, 6.EE.A.4, 2.OA.A, 3.OA.A, 6.EE.A.4	½ Block	Individual	Yes (No Weight)
End-of-Unit Assessment (End of Unit – Optional) *Illustrative Mathematics*	7.EE.B.4.b, 7.EE.A.1, 7.EE.B.3, 7.EE.B.4	1 Block	Individual	Yes
Accelerated Grade 7 Interim Assessment 2 (Late March) *iReady Standards Mastery*	7.RP.1, 7.RP.3-1, 7.RP.3-2	1 Block	Individual	Yes

Unit 5 Performance Assessment Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Unit 5 Performance Task *Fishing Adventures*	7.EE.B.4	½ Block	Individual	Yes; Rubric
Unit 5 Performance Task Option 1 (Optional) *Miles to Kilometers*	7.EE.A.1	Teacher Discretion	Teacher Discretion	Yes, if administered
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*

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.

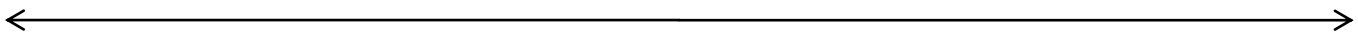
Group 1 has 4 people

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.

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

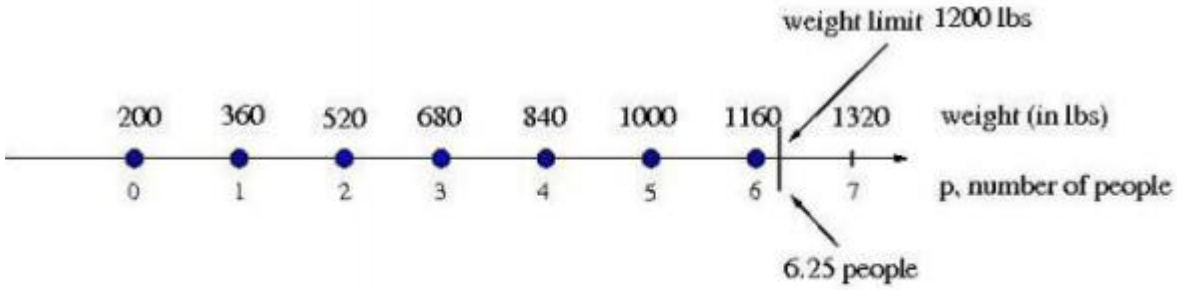


Accelerated 7th Grade Fishing Adventures – Rubric Name: _____ Date: _____

NJSLS: 7.EE.B.4 Type: _____ Teacher: _____

Task Description	• 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 ➢ 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				
Command Level Description	***Level 5:*** ***Distinguished Command*** Perform the task items accurately or with minor computation errors.	***Level 4:*** ***Strong Command*** Perform the task items with some non-conceptual errors	***Level 3:*** ***Moderate Command*** Perform the task items with minor conceptual errors and some computation errors.	***Level 2:*** ***Partial Command*** Perform the task items with some errors on both math concept and computation.	***Level 1:*** ***No Command*** Perform the task items with serious errors on both math concept and computation.
Score range	*11-12 pts*	*8-10 pts*	*6-7 pts*	*3-5 pts*	*0-2 pts*
Task Score & PLD Assigned					

Accelerated 7th Grade Fishing Adventures – Scoring Guide **NAME: _____**

#	Answer	Scoring
Part A	$\text{For Group 1 : } 160(4) + 200 = 840 \leq 1200$ $\text{For Group 2 : } 160(5) + 200 = 1000 \leq 1200$ $\text{For Group 3 : } 160(8) + 200 = 1480 \not\leq 1200$	2 points: for ***each*** group 1 point for correctly saying whether or not they will arrive safely and 1 point for each algebraic justification. **6 TOTAL POINTS**
Part B	• P= the number of people • $160p + 200 \leq 1200$ • Graph  	1 point for correctly defining their own variables. INEQUALITY • 3 points: Correct inequality (or something equivalent) • 2 points: Student disregards the extra 10 pounds per person OR the extra 200 pounds per group OR uses "<" instead of "<=" (ex: 150p<1000; 160p<1200) GRAPH • 2 points: correct intervals and solution shading • 1 point: student uses "<" instead of "<=" **6 TOTAL POINTS**

Name _____ Block _____ Date _____

Miles to Kilometers (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.

IX. Modifications

Special Education/ 504:	English Language Learners:
-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	- 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:**
- 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: ● 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)	- 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

- **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.
- **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

ILLUSTRATIVE MATHEMATICS V. 2019
(OPEN UP RESOURCES)

GRADE	TEACHER RESOURCES	STUDENT RESOURCES
6	• **Teacher Edition: Unit 1-9** • Online Course Guide	• Student Workbook Set: Unit 1-9 • Online Student Access (Digital Applets)
7	• **Teacher Edition: Unit 1-9** • Online Course Guide	• Student Workbook Set: Unit 1-9 • Online Student Access (Digital Applets)
8	• **Teacher Edition: Unit 1-9** • Online Course Guide	• Student Workbook Set: Unit 1-9 • Online Student Access (Digital Applets)

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

* 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/

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/