Orange Public Schools

Office of Curriculum & Instruction
2019-2020 Mathematics Curriculum Guide

7th Grade Mathematics (Accelerated)

Illustrative Mathematics - Unit 1: Scale Drawings and Proportional Relationships

September 9, 2019 – October 9, 2019

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

Table of Contents

References

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

I. Unit Overview

In this unit, students learn to understand and use the terms “scaled copy,” “to scale,” “scale factor,” “scale drawing,” and “scale,” and recognize when two pictures or plane figures are or are not scaled copies of each other. They use tables to reason about measurements in scaled copies, and recognize that angle measures are preserved in scaled copies, but lengths are scaled by a scale factor and areas by the square of the scale factor. They make, interpret, and reason about scale drawings. These include maps and floor plans that have scales with and without units.

Additionally, students learn to understand and use the terms “proportional,” “constant of proportionality,” and “proportional relationship,” and recognize when a relationship is or is not proportional. They represent proportional relationships with tables, equations, and graphs. Students use these terms and representations in reasoning about situations that involve constant speed, unit pricing, and measurement conversions.

Essential Questions
• How can proportional relationships and scale be applied to create and draw geometric shapes? • How can you distinguish relationships that are proportional from relationships that are not proportional? • How can proportional relationships be used to determine similarity?
Enduring Understanding
• Scale Factor influences similarity between figures in that if their corresponding sides are not proportional, they cannot be similar. • Two figures are similar if they are the same shape and have congruent corresponding angles. • A proportion may be solved to convert between units of measurement.

II. Pacing Guide

Activity	New Jersey State Learning Standards (NJSLS)	Estimated Time (Blocks)
Lesson 1: What are Scaled Copies?	7.G.A.1	1
Lesson 2: Making Scaled Copies	7.G.A.1	1
Lesson 3: The Size of the Scale Factor	7.G.A.1	1
Lesson 4: Scaling and Area	7.G.A.1, 7.G.B.6	1
Lesson 5: Scale Drawings and Maps	7.G.A.1	1
Lesson 6: Changing Scales	7.G.A.1	1
Lesson 7: Scales without Units	7.G.A.1	1
Lesson 8: Units in Scale Drawings	7.G.A.1	1
Lesson 9: Introducing Proportional Relationships with Tables	7.RP.A.2.a, 7.RP.A.2.b, 7.RP.A.2	1
Lesson 10: More About Constant of Proportionality	7.RP.A.2.a, 7.RP.A.2.b, 7.RP.A.2	1
Lesson 11: Proportional Relationships and Equations	7.RP.A.2.b, 7.RP.A.2.c, 7.RP.A.2	1
Lesson 12: Using Equations to Solve Problems	7.RP.A.2.c, 7.RP.A.2	1
Lesson 13: Comparing Relationships with Tables	7.RP.A.2	1
Lesson 14: Comparing Relationships with Equations	7.G.B.6, 7.RP.A.1, 7.RP.A.2	1
Lesson 15: Solving Problems about Proportional Relationships	7.RP.A.2	1
Lesson 16: Interpreting Graphs of Proportional Relationships	7.RP.A.2.a, 7.RP.A.2.d, 7.RP.A.2	1
Lesson 17: Using Graphs to Compare Relationships	7.RP.A.2	1
Lesson 18: Two Graphs for Each Relationship	7.RP.A.2	1
Performance Task 1 *(Project Based Learning)*	7.G.A.1	**½**
Total Time		**18 ½ Blocks**

Major Work Supporting Content Additional Content

III. Scope & Sequence

Accelerated Unit Lesson	Accelerated Lesson Name	Original Unit Lesson	Activity Name
1.1	What are Scaled Copies?	7.1.1	Printing Portraits
		7.1.1	Scaling F
		7.1.1	Pairs of Scaled Polygons
		7.1.2	Corresponding Parts
		7.1.2	Scaled Triangles
		7.1.2	Comparing Polygons ABCD and PQRS
1.2	Making Scaled Copies	7.1.3	More or Less?
		7.1.3	Which Operations? (Part 1)
		7.1.3	Which Operations? (Part 2)
		7.1.3	More Scaled Copies
		7.1.4	Three Quadrilaterals (Part 1)
		7.1.4	Three Quadrilaterals (Part 2)
		7.1.4	Scaled or Not Scaled?
		7.1.4	Comparing Pictures of Birds
1.3	The Size of the Scale Factor	7.1.5	Number Talk: Missing Factor
		7.1.5	Scaled Copies Card Sort
		7.1.5	Missing Figure, Factor, or Copy
		7.1.5	Scaling a Rectangle
1.4	Scaling and Area	7.1.6	Scaling a Pattern Block
		7.1.6	Scaling More Pattern Blocks
		7.1.6	Area of Scaled Parallelograms and Triangles
		7.1.6	Enlarged Areas
1.5	Scale Drawings and Maps	7.1.7	What is a Scale Drawing?
		7.1.7	Sizing Up a Basketball Court
		7.1.7	Tall Structures
		7.1.7	Length of a Bus and Width of a Lake
		7.1.8	Driving on I-90
		7.1.8	Biking Through Kansas
1.6	Changing Scales	7.1.9	Two Maps of Utah
		7.1.10	Appropriate Measurements
		7.1.10	Same Plot, Different Drawings
		7.1.10	A New Drawing of the Playground
1.7	Scales Without Units	7.1.11	One to One Hundred
		7.1.11	Apollo Lunar Module
		7.1.11	Same Drawing, Different Scales
		7.1.11	Scaled Courtyard Drawings
1.8	Units in Scale Drawings	7.1.12	Centimeters in a Mile
		7.1.12	Scales Card Sort
		7.1.12	The World's Largest Flag (optional)
		7.1.12	Pondering Pools (optional)
		7.1.12	Drawing the Backyard
1.9	Introducing Proportional Relationships with Tables	7.2.2	Notice & Wonder: Paper Towels by the Case
		7.2.2	Feeding a Crowd
		7.2.2	Making Bread Dough
		7.2.2	Quarters and Dimes
		7.2.2	Green Paint

1.10	More About Constant of Proportionality	7.2.3	Equal Measures
		7.2.3	Centimeters and Millimeters
		7.2.3	Pittsburgh to Phoenix
		7.2.3	Fish Tank
1.11	Proportional Relationships and Equations	7.2.4	Feeding a Crowd, Revisited
		7.2.4	Denver to Chicago
		7.2.5	Meters and Centimeters
		7.2.5	Filling a Water Cooler
1.12	Using Equations to Solve Problems	7.2.6	Number Talk: Quotients with Decimal Points
		7.2.6	Concert Ticket Sales
		7.2.6	Recycling
		7.2.6	Granola
1.13	Comparing Relationships with Tables	7.2.7	Adjusting a Recipe
		7.2.7	Visiting the State Park
		7.2.7	Running Laps
		7.2.7	Apples and Pizza
1.14	Comparing Relationships with Equations	7.2.8	Notice & Wonder: Patterns with Rectangles
		7.2.8	More Conversions
		7.2.8	Total Edge Length, Surface Area, & Volume
		7.2.8	All Kinds of Equations
		7.2.8	Tables and Chairs
1.15	Solving Problems about Proportional Relationships	7.2.9	What Do You Want to Know?
		7.2.9	Info Gap: Biking and Rain
		7.2.9	Moderating Comments
		7.2.9	Steel Beams
1.16	Interpreting Graphs of Proportional Relationships	7.2.10	Notice These Points
		7.2.10	T-shirts for Sale
		7.2.10	Matching Tables and Graphs
		7.2.11	What Could the Graph Represent?
		7.2.11	Seagulls Eat What?
1.17	Using Graphs to Compare Relationships	7.2.12	Number Talk: Fraction Multiplication & Division
		7.2.12	Race to the Bumper Cars
		7.2.12	Space Rocks and the Price of Rope
		7.2.12	Revisiting the Amusement Park
1.18	Two Graphs for Each Relationship	7.2.13	True or False? Fractions and Decimals
		7.2.13	Tables, Graphs, and Equations
		7.2.13	Hot Dog Eating Contest
		7.2.13	Spicy Popcorn

IV. Pacing Calendar

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

SEPTEMBER

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**					

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

OCTOBER

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.G.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	i) Tasks may or may not have context	MP.2 MP.5	No
7.G.6	Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	i) Tasks may or may not have context	MP.2 MP.5	No
7.RP.2a	Recognize and represent proportional relationships between quantities: 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.	i) Tasks have "thin context"2 or no context. ii) Tasks are not limited to ratios of whole numbers. iii) Tasks use only coordinates in Quadrant 1 and use only a positive constant of proportionality.	MP.2 MP.5	Yes
7.RP.2b	Recognize and represent proportional relationships between quantities: b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	i) Tasks may or may not have a context. ii) Tasks sample equally across the listed representations (graphs, equations, diagrams, and verbal descriptions). iii) Tasks use only coordinates in Quadrant 1 and use only a positive constant of proportionality.	MP.2 MP.5 MP.8	No
7.D.2	Solve multi-step contextual problems with degree of difficulty appropriate to grade 7, requiring application of knowledge and skills articulated in 6.RP.A, 6.EE.C, 6.G.	i) Tasks may have scaffolding, if necessary, in order to yield a degree of difficulty appropriate to grade 7.	MP.1 MP.2 MP.4 MP.5 MP.7	Yes
7.C.6.1	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. Content Scope: Knowledge and skills articulated in 7.RP.2	i) Tasks use only coordinates in Quadrant 1 and use only a positive constant of proportionality.	MP.2 MP.3 MP.6	Yes

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

VII. Vocabulary

Corresponding:	If a part of the original figure matches up with a part of the copy, we call them corresponding parts. The part could be an angle, point, or side, and you can have corresponding angles, corresponding points, or corresponding sides. If you have a distance between two points in the original figure, then the distance between the corresponding points in the copy is called the corresponding distance.
Constant of Proportionality	See proportional relationship.
Origin	In the coordinate plane, the origin is the point (0,0).
Proportional Relationship	If there is a positive constant k so that the quantities *x* and *y* are related by the equation $y=kx$, then we say that *y* and *x* are in a proportional relationship, and that y is proportional to *x*. The constant *k* is called the constant of proportionality.
Scaled Copy:	Scaled copy of a figure is a figure in which every length in the original figure is increased or decreased by the same scale factor.
Scale Drawing:	A scale drawing of an object is a drawing in which all lengths in the drawing correspond to lengths in the object by the same scale. The scale tells you how the lengths correspond; for example, a scale of "1 inch to 2 feet" means that 1 inch in the drawing represents 2 feet in the object.
Scale Factor:	Scale factor is the factor by which every length in an original figure is increased or decreased when you make a scaled copy. For example, if you draw a copy of a figure in which every length is magnified by 2, then you have a scaled copy with a scale factor of 2.

VIII. Assessment Framework

Unit 1 Assessment Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Pre-Unit 1 Diagnostic Assessment (Beginning of Unit – Optional) *Illustrative Mathematics*	4.MD.A.1, 5.MD.A.1, 5.NF.B.5.a, 6.G.A.1, 6.EE.A.2.c, 6.RP.A.3.a, 7.G.A.1	½ Block	Individual	Yes (No Weight)
End-of-Unit 1 Assessment (End of Unit – Optional) *Illustrative Mathematics*	7.G.A.1, 7.RP.A.2.a	1 Block	Individual	Yes
Pre-Unit 2 Diagnostic Assessment (Beginning of Unit – Optional) *Illustrative Mathematics*	6.RP.A.1,6.RP.A.3.a, 6.RP.A.2,6.RP.A.3.b, 6.RP.A.3,	½ Block	Individual	Yes (No Weight)
End-of-Unit 2 Assessment (End of Unit – Optional) *Illustrative Mathematics*	7.RP.A.2a, 7.RP.A.2d,7.RP.A.2c, 7.RP.A.2b, 7.RP.A.2	1 Block	Individual	Yes

Unit 1 Performance Assessment Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Unit 1 Performance Task 1 (Early October) *Map Distance*	7.G.A.1	½ Block	Individual	Yes; Rubric
Unit 1 Performance Task Option 1 (Optional) *Buy Coffee*	7.RP.A.2	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

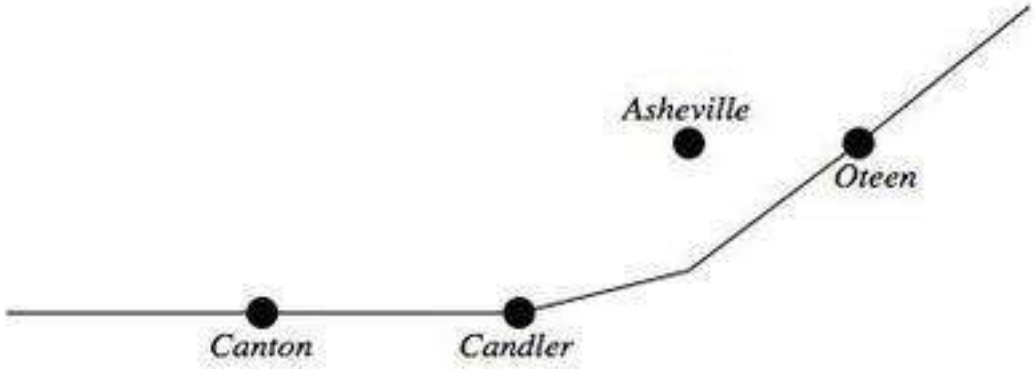
* Use the following links to access ECR protocol and district assessment scoring documents:

- *Assessment & Data in Mathematics Bulletin*
- *Extended Constructed Response Protocol*

Name _____ Block _____ Date _____

Map Distance (7.G.A.1)

On the map below, ¼ inch represents one mile. Candler, Candor, and Oteen are three cities on the map.



a. If the distance between the real towns of Candler and Canton is 9 miles, how far apart are Canton and Candler on the map?

b. If Candler and Oteen are 3½ inches apart on the map, what is the actual distance between Candler and Oteen in miles?

Accelerated 7th Grade Map Distance – Rubric Name: _____ Date: _____

NJSLS: 7.G.A.1 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	*5 pts*	*4 pts*	*3 pts*	*2 pts*	*0-1 pt*
Task Score & PLD Assigned					

7th Grade Map Distance – Scoring Guide **NAME: _____**

#	Answer	Scoring
Part A	**** Solutions may vary *** A distance of nine miles means 9 quarter inches on the map. This is $9 \times \frac{1}{4} = 9/4$ Or 2¼ inches between Candler and Canton on the map. 	2 points: 1 point for the correct strategy and 1 point for an accurate explanation **2 TOTAL POINTS**
Part B	To find this, we divide: $3\frac{1}{2} \div \frac{1}{4} = 7/2 \times 4/1 = 14$ So, there are 14 miles between Chandler and Oteen.	2 points: for correctly dividing the fractions. OR 1 point: for identifying the necessary expression with minor mistakes. 1 point for correct explanation. **3 TOTAL POINTS**

Name _____ Block _____ Date _____

Buying Coffee (7.RP.A.2)

Coffee costs $18.96 for 3 pounds.

1. What is the cost for one pound of coffee?

2. At this store, the price for a pound of coffee is the same no matter how many pounds you buy. Let x be the number of pounds of coffee and y be the total cost of x pounds. Draw a graph of the relationship between the number of pounds of coffee and the total cost.

3. Where can you see the cost per pound of coffee in the graph? What is it?

X. 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 and texts*, building on others' ideas and expressing their own clearly.
W.7.1	Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

XI. 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/