

NJDOE MODEL CURRICULUM

CONTENT AREA: Mathematics GRADE: 5 UNIT: # 4 UNIT NAME: Fraction Multiplication by a Whole Number and Scaling

STUDENT LEARNING OBJECTIVES		CORRESPONDING CCSS	
1	Describe the place value of numeral digits relative to both the place to the right and the place to the left (decimal to hundredths and whole numbers to billions).	5.NBT.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
2	Add, subtract, multiply, and divide decimals to hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; and, explain the reasoning used.	5.NBT.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
3	Convert standard measurement units within the same system (e.g., centimeters to meters) to solve multi-step problems).	5.MD.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
4	Solve real world problems involving multiplication of fractions (including mixed numbers), using visual fraction models or equations to represent the problem.	5.NF.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g. by using visual fraction models or equations to represent the problem.
5	Divide a unit fraction by a non-zero whole number and interpret by creating a story context or visual fraction model.	5.NF.7a	Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.
6	Divide a whole number by a unit fraction and interpret by creating a story context or visual fraction model.	5.NF.7b	Interpret division of a whole number by a unit fraction, and compute such quotients. <i>For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.</i>

STUDENT LEARNING OBJECTIVES		CORRESPONDING CCSS	
7	Solve real world problems involving division of unit fractions by whole numbers or whole numbers by unit fractions.	5.NF.7c	Solve real world <i>problems</i> involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, how much chocolate will each person get if 3 people share $\frac{1}{2}$ pound of chocolate equally? How many $\frac{1}{3}$ cup servings are in 2 cups of raisins?</i>

Major Content **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks). **Bold type indicates grade level fluency requirements.** (Identified by PARCC Model Content Frameworks).

Selected Opportunities for Connection to Mathematical Practices

1. Make sense of problems and persevere in solving them.

SLO #2 Use concrete objects or pictures to help conceptualize adding, subtracting, multiplying, or dividing by decimals to the hundredths.

SLO #4 Explain correspondences between real world problems and equations involving multiplication of fractions.

SLO #5 Explain correspondences between story contexts and visual fraction models when dividing a unit fraction by a whole number.

SLO #6 Explain correspondences between story contexts and visual fraction models when a whole number by a unit fraction.

2. Reason abstractly and quantitatively.

SLO #1 Understand and make sense of quantities as they relate to place value of numeral digits.

SLO #2 Understand and make sense of quantities and their relationships when adding, subtracting, multiplying, or dividing by decimals to the hundredths.

SLO #3 Understand and make sense of quantities when converting measurements within a system.

SLO #5 Understand and make sense of the quantities and relationships when dividing unit fractions by whole numbers.

SLO #5 Use quantitative reasoning to create a coherent representation and understand the quantities when dividing unit fractions by whole numbers.

SLO #6 Understand and make sense of the quantities and relationships when dividing whole numbers by unit fractions.

SLO #6 Use quantitative reasoning to create a coherent representation and understand the quantities when dividing whole numbers by unit fractions.

3. Construct viable arguments and critique the Model with mathematics.

SLO #1 Understand and use stated assumptions, definitions, and previous results to describe place value of numeral digits.

SLO #2 Explain and justify the reasoning, based on models, drawings, or strategies, used to add, subtract, multiply, and divide by decimals.

4. Model with mathematics.

SLO #4 Apply previously learned concepts about multiplication of fractions in order to solve real world problems.

SLO #4 Map the relationship, using tools, between real world problems involving multiplication of fractions, and the models and equations that represent them.

SLO #7 Apply previously learned concepts about division of unit fractions and whole numbers to solve real world problems.

5. Use appropriate tools strategically.

SLO #1 Consider available tools, such as visual models and story contexts, when multiplying fractions by whole numbers.

6. SLO #2 Consider and use available tools, such as models and drawings, when solving addition, subtraction, multiplication, or division problems involving decimals.

SLO #4 Consider available tools, such as visual models and equations, when solving real world problems that involve multiplication of fractions.

SLO #5 Consider and use available tools, such as visual models and story contexts, when solving division problems involving unit fractions by whole numbers.

SLO #5 Consider and use available tools, such as visual models and story contexts, when solving division problems involving whole numbers by unit fractions.

7. Attend to precision.

SLO #1 Communicate and describe precisely quantities of numbers and how they relate to place value.

8. Look for and make use of structure.

SLO #1 Look for and discern a pattern when changing place value of numeral digits.

SLO #2 Look for and discern a pattern when adding, subtracting, multiplying, or dividing by decimals.

SLO #3 Look for and discern a pattern when converting standard measurement units within a system.

9. Look for and express regularity in repeated reasoning.

Bold type identifies possible starting points for connections to the SLOs in this unit.

Greater Brunswick Charter School Curriculum

Grade level: 5		Subject: Math			Unit #: 4		
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
<p><i>This unit has two sections: a minor portion involves work with measurement. The SLOs require only that students convert measures within their own system. Your text does significantly more than that. The lessons that are not directly related to the SLO will be in gray to indicate they are optional but, probably, worthy of study. The major portion of this unit is more work with multiplication and division of mixed numbers and decimal place value. Both of those have been treated in prior units, although the mixed number work was introduced just recently. It is here as further practice, but also as a review for a major skill on the PARCC assessment. For those reasons, you can choose which to do first. If you wish to continue with the mixed numbers, you are welcomed to review difficulties students had on the Unit 3 Assessment and engage them on it then continue the practice in multiplication and division of mixed numbers. You can use some of the same text pages as you used in the last unit with the additional resources offered here. Alternatively, if you wish to provide a break and return to it later as a second time around with that content, the measurement lessons can be completed first.</i></p>							
1	Measurement	3	To determine readiness for study in measurement.	<i>What do I already know about measuring and converting units?</i>		<ul style="list-style-type: none"> Lesson/Guided practice Independent practice Intervention/Enrichment i-Ready 	MyMath p.789-800
2	Measure with a ruler	3	To accurately measure objects with a customary system ruler	<i>If I need 13 inches of rope, how can I get it?</i>		<ul style="list-style-type: none"> Lesson/Guided practice Independent practice Intervention/Enrichment i-Ready 	MyMath 11.1 p.801-806

Grade level: 5

Subject: Math

Unit #: 4

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
3	Converting length	3	To convert between inches, feet, yards, and miles	<i>How do I use the unit of measure I need when I don't have it?</i>	<p><i>Since they know multiplication of fractions, show them the scientific way to do all conversions. They'll thank you for it in the future.</i></p> <p><i>8 yards = X feet</i></p> <p><i>8 yards X 3 feet = 24 feet</i></p> <p><i>± 1 yard</i></p> <p><i>Mathematically, the fraction to the right of the X is equal to 1. Using the Commutative Property after you multiply, <u>yard=1</u></i></p> <p><i>Yard</i></p> <p><i>This works for multiple conversions:</i></p> <p><i>144 in = X yards</i></p> <p><i>144 in X 1 ft X <u>1 yard</u> =</i></p> <p><i>1 12 in 3 ft</i></p> <p><i><u>144 yd</u> = 4 yds</i></p> <p><i>36</i></p>	<ul style="list-style-type: none"> • Lesson/Guided practice • Independent practice • Intervention/Enrichment • i-Ready 	MyMath 11.2 p.807-812
4	Converting measures of length	3	To convert measures as part of solving problems.	<i>How am I going to use this in the real world?</i>		<ul style="list-style-type: none"> • Lesson/Guided practice • Independent practice • Intervention/Enrichment • i-Ready 	MyMath 11.3 p.813-818
5	Measuring in metric units	3	To measure using centimeters and meters.	<i>How long is that thing in metrics?</i>	<p><i>Be sure to have the students learn the general sizes at the bottom of page 851.</i></p>	<ul style="list-style-type: none"> • Independent practice • Intervention/Enrichment as needed for strugglers • i-Ready 	MyMath 11.9 p.851-856

Grade level: 5

Subject: Math

Unit #: 4

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
6	Convert metric units of length	3	To convert metric units of length	<i>How do I use the unit of measure I need when I don't have it?</i>	<i>The same scientific method for converting works here as well. But moving the decimal point is easier. If you line up the unit prefixes, highest to lowest, left to right, Kil Hec Dek 1 Dec Cen Mil the decimal will convert itself each time by counting the steps from one to another. The decimal will move in the same direction. 1234 cm = X m Go from cm to m is two steps to left. Move the decimal two places to the left: 12.34m</i>	<ul style="list-style-type: none"> • Lesson/Guided practice • Independent practice • Intervention/Enrichment • i-Ready 	MyMath 11.10 p.857-862
7	Estimate and measure customary weight	3	To make reasonably accurate estimates of the weight of objects.	<i>How can I get better at guessing something's weight?</i>		<ul style="list-style-type: none"> • Independent practice • Intervention/Enrichment as needed for strugglers • i-Ready 	MyMath 11.4 p.819-824
8	Convert customary weights	3	To convert between ounces, pounds, and tons.	<i>How do I use the unit of measure I need when I don't have it?</i>	<i>The same scientific method for converting works here as well.</i>	<ul style="list-style-type: none"> • Independent practice • Intervention/Enrichment as needed for strugglers • i-Ready 	MyMath 11.5 p.825-830
9	Estimate and measure metric weight	3	To make reasonably accurate estimates of the weight of objects.	<i>How can I get better at guessing something's weight?</i>	<i>Emphasize that mass and weight is the same thing until they get to 11th grade. ☺</i>	<ul style="list-style-type: none"> • Independent practice • Intervention/Enrichment as needed for strugglers • i-Ready 	MyMath 11.11 p.865-870
10	Convert metric units of weight	3	To convert metric units of weight	<i>How do I use the unit of measure I need when I don't have it?</i>		<ul style="list-style-type: none"> • Lesson/Guided practice • Independent practice • Intervention/Enrichment • i-Ready 	MyMath 11.12 p.871-876

Grade level: 5		Subject: Math			Unit #: 4		
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
11	Estimating and converting customary and metric units of length and weight	3	To determine mastery of content	<i>What do I know so far?</i>		<ul style="list-style-type: none"> Independent practice Intervention for strugglers 	MyMath p.831, 832 Make up your own metric problems
12	Estimating and converting customary and metric units of length and weight	3				<ul style="list-style-type: none"> Review Assessment 	
13	Estimate and measure customary system capacity	3	To make reasonably accurate estimates of the weight of objects.	<i>How can I get better at guessing how much is in that container?</i>		<ul style="list-style-type: none"> Lesson/Guided practice Independent practice Intervention/Enrichment i-Ready 	MyMath 11.6 p.833-838
14	Convert customary system units of capacity	3	To convert customary units of capacity	<i>How do I use the unit of measure I need when I don't have it?</i>	<i>Use the same scientific conversion method.</i>	<ul style="list-style-type: none"> Independent practice Intervention/Enrichment as needed for strugglers i-Ready 	MyMath 11.7 p.839-844
15	Estimate and measure metric capacity	3	To make reasonably accurate estimates of capacities.	<i>How can I get better at guessing how much is in that container?</i>		<ul style="list-style-type: none"> Review Assessment 	<ul style="list-style-type: none"> A YouTube lesson and more on the side A wksht for after the lesson Another one A bunch more
16	Convert metric units of capacity	3	To convert metric units of capacity.	<i>How do I use the unit of measure I need when I don't have it?</i>		<ul style="list-style-type: none"> Lesson/Guided practice Independent practice Intervention/Enrichment i-Ready 	MyMath 11.13 p.877-882
17	Measurement on a number line	3, 4	To estimate placement of a fraction on a number line.	<i>How is a number line with fractions a lot like a ruler between 0 and 1 inch?</i>	<i>This is peripherally related to SLO 4 in that it returns students to thinking about fractions and models.</i>	<ul style="list-style-type: none"> Lesson/Guided practice Independent practice Intervention/Enrichment i-Ready 	MyMath 11.8 p.845-850

Grade level: 5		Subject: Math			Unit #: 4		
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
18	Converting customary and metric units of length, weight, and capacity	3	To determine mastery of converting skills		Just assess the converting skills in all six areas.	<ul style="list-style-type: none"> Review Assessment 	
<p><i>Below are lessons for review of decimal place value, operations with decimals, and mixed number multiplication and division. If you are reading ahead here, you could use the worksheets in the resource column below as a station during small group rotations. Best placed in the group before the lesson (so you can check them and remediate as needed) or at the intervention station.</i></p>							
19	Place value in decimals	1	To identify the place value in a decimal number.			<ul style="list-style-type: none"> Independent practice Intervention/Enrichment i-Ready 	List of KhanAcademy lessons Worksheet 1 Worksheet 2
20	Adding and subtracting decimals	2	To add and subtract decimal numerals			<ul style="list-style-type: none"> Independent practice Intervention/Enrichment i-Ready 	<ul style="list-style-type: none"> KhanAcademy lesson for addition KhanAcademy lesson for subtraction Worksheets for all decimal operations
21	Multiplying and dividing decimals	2	To multiply and divide decimals		<i>Use small numbers. You're only making sure they know how to move the decimal in the operation.</i>	<ul style="list-style-type: none"> Lesson/Guided practice Independent practice Intervention/Enrichment i-Ready 	<ul style="list-style-type: none"> KhanAcademy lesson for multiplication Simple KhanAcademy lesson for division Worksheets for all decimal operations
22	Operations with decimals	1, 2	To accurately and fluently perform operations with decimals		<i>Take an additional day to solidify these skills for struggling students with very small group instruction while achievers work with something else of interest or problems from the next lessons.</i>	<ul style="list-style-type: none"> Independent practice Intervention for strugglers i-Ready 	Resources as listed above

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23	Multiplying mixed numbers and making stories from problems	4, 5, 6, 7	To accurately multiply mixed numbers and create stories from numbers and operations	<i>How can I show that I really understand what multiplying by a fraction means?</i>	<i>The resource to the right provides many models for making stories. It also provides many problems to be solved.</i>	<ul style="list-style-type: none"> Lesson/Guided practice Independent practice Intervention/Enrichment i-Ready 	<ul style="list-style-type: none"> Great resource for fraction stories KhanAcademysolutions 																																										
24	Dividing a unit fraction by a whole number	5	To divide unit fraction by a whole number	<i>How is dividing by a whole number just like multiplying by a fraction?</i>		<ul style="list-style-type: none"> Lesson/Guided practice Independent practice Intervention/Enrichment i-Ready 	<ul style="list-style-type: none"> KhanAcademy lesson and problems Worksheetsland Many varieties of fractions dividing worksheets 																																										
25	Dividing a whole number by a unit fraction	6	To divide a whole number by a fraction	<i>How is any dividing of fractions just like multiplying?</i>		<ul style="list-style-type: none"> Lesson/Guided practice Independent practice Intervention/Enrichment i-Ready 	<ul style="list-style-type: none"> Lesson for making stories Another lesson for making stories Many varieties of fractions dividing worksheets 																																										
26	Real life fraction problems	4, 5, 6, 7	To apply knowledge of operations with fractions to solve real world problems	<i>How can I use what I know about making stories to better understand stories I read?</i>	<i>Remember to stay away from keywords and focus students on making a movie in their mind as they read the problem.</i>	<ul style="list-style-type: none"> Independent practice Intervention/Enrichment i-Ready 	<ul style="list-style-type: none"> Varieties of word problems using fractions A ton of fraction sheets – dividing near the bottom 																																										
27																																																	
28	Assessment	4				<ul style="list-style-type: none"> Review Assessment 																																											
<p>Word Wall Candidates</p> <p><i>In this portion of the vocabulary box, the measures are paired and staggered at their relative sizes</i></p> <table> <tr> <td>Capacity</td> <td>Customary System</td> <td>Inch</td> <td>Millimeter</td> <td>Fluid ounce</td> <td>Milliliter</td> <td>Milligram</td> </tr> <tr> <td>Length</td> <td>Metric System</td> <td>Foot</td> <td>Centimeter</td> <td>Cup</td> <td></td> <td>Gram</td> </tr> <tr> <td>Mass</td> <td>Fair share</td> <td>Yard</td> <td>Meter</td> <td>Pint</td> <td></td> <td>Ounce</td> </tr> <tr> <td>Weight</td> <td>Convert</td> <td>Mile</td> <td>Kilometer</td> <td>Quart</td> <td>Liter</td> <td>Pound</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>Gallon</td> <td></td> <td>Kilogram</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Ton</td> </tr> </table>								Capacity	Customary System	Inch	Millimeter	Fluid ounce	Milliliter	Milligram	Length	Metric System	Foot	Centimeter	Cup		Gram	Mass	Fair share	Yard	Meter	Pint		Ounce	Weight	Convert	Mile	Kilometer	Quart	Liter	Pound					Gallon		Kilogram							Ton
Capacity	Customary System	Inch	Millimeter	Fluid ounce	Milliliter	Milligram																																											
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Grade level: 5

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Unit #: 4

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	

Authentic Application

Your goal: Make a tale of one day in your life with stories that involve fractions

Your role: Master Story Teller.

Your audience: Your classmates.

The situation: You are to make a series of stories that provide details about one day in your life and how you used fractions a different points in the day. These can be real things that happened or stories you make up. However, each story must require your audience to make a computation with a fraction or mixed number. The stories should include a length of something, the weight of something, or a liquid container that you used.

Example 1: "When I made my breakfast, I poured milk for my cereal from a 64 ounce container of milk. I used 1/16 of the container. How much milk did I need for my cereal?"

Example 2: "My friend and I had to move a carton of bricks from one side of his house to the other side. The carton weighed 250 pounds and was too heavy for us so we had to take the bricks out and move them separately. I moved 150 pounds of bricks. What fraction of the bricks did my friend move?"

Your Product: A least four stories that describe your day. The correct solutions must also be provided with your stories. The best stories will be used for the class test.

Success Criteria: Scoring rubric:

	4 points	3 points	2 points	1 point	0 points
Stories	5 points is awarded for each story that contains fractions as part of the problem. (Like Ex. 1 above) 3 points is awarded for each story if the only fraction is the solution. (Like Ex. 2 above)				
Fraction count	1 point is awarded for each proper fraction used in a story. 2 points are awarded for each mixed number used in a story 2 points are awarded for each solution that involves a mixed number 1 point is awarded for each customary system measure that is used in a story 2 points are awarded for each metric measure used in a story				
Creativity	1 point is awarded for each story that includes an unusual happenstance 2 points are awarded for each story that makes the reader/listener laugh or smile 1 point is awarded for each noun used that is listed on the classroom Word Wall				