

**MOBILE COUNTY PUBLIC SCHOOLS  
DIVISION OF CURRICULUM & INSTRUCTION  
FIFTH GRADE MATHEMATICS INSTRUCTIONAL PLANNING GUIDE  
2017-2018: QTR 3**

**Qtr. 3: Weeks 1-3**

**January 4 – January 25 (15 days)**

**Grade 5 , Unit 7: Multiplication of Fractions**

**UNIT OVERVIEW: MULTIPLYING FRACTIONS AND ALGEBRAIC EXPRESSIONS**

In this unit, students extend work of multiplication from earlier grades. In fourth grade, students worked with recognizing that a fraction such as  $\frac{3}{5}$  actually could be represented as 3 pieces that are each one-fifth ( $3 \times (\frac{1}{5})$ ). This unit references both multiplication of fraction by a whole number and the multiplication of two fractions.

**ESSENTIAL QUESTIONS:**

- How can you use compatible numbers to estimate with fractions and mixed numbers?
- How can you multiply a fraction by a fraction?
- How can you find the area of a rectangle with fractional side lengths?
- How can you multiply mixed numbers?
- How do you use multiplication to scale or resize?

**KEY VOCABULARY:**

fraction, numerator, denominator, operations, multiplication/multiply, division/divide, mixed numbers, product, quotient, partition, equal parts, equivalent, factor, unit fraction, area, side lengths, fractional sides lengths, scaling, comparing, fraction greater than 1

*Basic Fact Assessment: Multiplication (factors 0-12) & Division (divisors 0-12 & quotients 0-12) - Separated*

**Standards/Objectives**

**Mastery Standards**

**Standards Clarification**

**[5.NF.5a]** Interpret multiplication as scaling (resizing), by:  
a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication

**[5-NF.5a]** Examine magnitude of products in terms of the relationship between two types of problems.

**[5-NF.5b]** Interpret multiplication as scaling (resizing), by:  
b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence  $\frac{a}{b} = \frac{(n \times a)}{(n \times b)}$  to the effect of multiplying  $\frac{a}{b}$  by 1

**[5-NF.5b]** Examine how numbers change when we multiply by fractions.

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<p><b>[5-NF.6]</b> Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.</p>	<p><b>[5-NF.6]</b> Solve real-world problems w/ multiplying fraction or whole by fraction w/ equations – <b><u>NO MIXED.</u></b></p>
<p><b>Opportunity for Depth Standards</b></p>	<p><b>Standards Clarification</b></p>
<p><b>[5-NF.4a]</b> Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product <math>(a/b) \times q</math> as a parts of a partition of <math>q</math> into <math>b</math> equal parts; equivalently, as the result of a sequence of operations <math>a \times q \div b</math>.</p>	<p><b>[5-NF.4a]</b> Multiply fraction or whole number by fraction, (partitioning, equal parts, visual models).</p>
<p><b>[5-NF.4b]</b> Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.</p>	<p><b>[5-NF.4b]</b> Students should continue the process of covering (with tiles).</p>
<p><b>[5-OA.1]</b> Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.</p>	<p><b>[5-OA.1]</b> Evaluate expressions w/ parentheses, brackets, braces.</p>
<p><b>[5-OA.2]</b> Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.</p>	<p><b>[5-OA.2]</b> Write expressions connected to calculations, interpret expressions w/o evaluating.</p>

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 DIVISION OF CURRICULUM & INSTRUCTION  
 FIFTH GRADE MATHEMATICS INSTRUCTIONAL PLANNING GUIDE  
 2017-2018: QTR 3

**Resources for Quarter 3 Unit 7**

<p>Engage New York Module 4 Topics C, D, E (Lessons 13-16), F, H – (NF4, NF5, NF6, OA1, OA2)  <a href="https://www.engageny.org/resource/grade-5-mathematics-module-4">https://www.engageny.org/resource/grade-5-mathematics-module-4</a></p> <p>Module 5 Topic C – (NF4, NF6)  <a href="https://www.engageny.org/resource/grade-5-mathematics-module-5">https://www.engageny.org/resource/grade-5-mathematics-module-5</a></p> <p>FAL – <i>Where are the Cookies?</i> – (NF4, NF5, NF6)  <a href="http://education.ky.gov/curriculum/connpro/Math/Documents/KDE_Fractions_%20Where%20are%20the%20Cookies_Problem%20Solving_Grades%204_6%20%20%20v5.0.pdf">http://education.ky.gov/curriculum/connpro/Math/Documents/KDE_Fractions_%20Where%20are%20the%20Cookies_Problem%20Solving_Grades%204_6%20%20%20v5.0.pdf</a></p>	<p>Georgia Standards Unit 1 – (OA1, OA2)  <a href="https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-1.pdf">https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-1.pdf</a></p> <p>Unit 4 – (NF4, NF5, NF6)  <a href="https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-4.pdf">https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-4.pdf</a></p> <p>FAL – <i>Where are the Cookies?</i> – (NF4, NF5, NF6)  <a href="http://education.ky.gov/curriculum/connpro/Math/Documents/KDE_Fractions_%20Where%20are%20the%20Cookies_Problem%20Solving_Grades%204_6%20%20%20v5.0.pdf">http://education.ky.gov/curriculum/connpro/Math/Documents/KDE_Fractions_%20Where%20are%20the%20Cookies_Problem%20Solving_Grades%204_6%20%20%20v5.0.pdf</a></p>	<p>Howard County (NF4)  <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-4-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-4-assessment-tasks</a> (NF5)  <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-5-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-5-assessment-tasks</a> (NF6)  <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-6-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-6-assessment-tasks</a> (OA1, OA2)  <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-oa-dot-2-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-oa-dot-2-assessment-tasks</a></p> <p>FAL – <i>Where are the Cookies?</i> – (NF4, NF5, NF6)  <a href="http://education.ky.gov/curriculum/connpro/Math/Documents/KDE_Fractions_%20Where%20are%20the%20Cookies_Problem%20Solving_Grades%204_6%20%20%20v5.0.pdf">http://education.ky.gov/curriculum/connpro/Math/Documents/KDE_Fractions_%20Where%20are%20the%20Cookies_Problem%20Solving_Grades%204_6%20%20%20v5.0.pdf</a></p>	<p>Math In Focus        Chapter 4 Lessons 1-7 – (NF4, NF5, NF6)        Chapter 5 Lessons 1-4 – (OA1, OA2)</p> <p>FAL – <i>Where are the Cookies?</i> – (NF4, NF5, NF6)  <a href="http://education.ky.gov/curriculum/connpro/Math/Documents/KDE_Fractions_%20Where%20are%20the%20Cookies_Problem%20Solving_Grades%204_6%20%20%20v5.0.pdf">http://education.ky.gov/curriculum/connpro/Math/Documents/KDE_Fractions_%20Where%20are%20the%20Cookies_Problem%20Solving_Grades%204_6%20%20%20v5.0.pdf</a></p>
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**Xtra Math** <https://xtramath.org/#/home/index> Free, individualized web based program that helps to build student fluency.

**Focus Standards for Mathematical Practice**

MP.7 Look for and make use of structure.

MP.8 Look for and express regularity in repeated reasoning.

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 2017-2018: QTR 3

Qtr. 3: Weeks 4-6

January 26 – February 22 (15 days)

**Grade Level 5, Unit 8: Fraction with Algebraic Expressions and Line Plots**

**UNIT OVERVIEW: OPERATIONS WITH FRACTIONS , ALGEBRIAC EXPRESSIONS, AND LINE PLOTS**

In this unit students will add and subtract fractions and mixed numbers by writing equivalent fractions, solve word problems involving fractions, perform algorithmic operations involving decimals, and write and evaluate algebraic expressions. Students should work with fractions by measuring objects to one-eighth of a unit. This includes length, mass, and liquid volume. Students are making a line plot of this data and then adding and subtracting fractions based on data in the line plot. The line plot should also include mixed numbers in fifth grade.

**ESSENTIAL QUESTIONS:**

- How can we model dividing a unit fraction by a whole number?
- What strategies can you use to estimate measurements?
- What happens to a measurement when you change its unit of measure to a related unit?
- How is data collected and displayed on a line plot?
- What strategies help when solving problems with line plots?

**KEY VOCABULARY:** line plot, length, mass, liquid volume, relative size, liquid volume, mass, length, kilometer (km), meter (m), centimeter (cm), kilogram (kg), gram (g), liter (L), milliliter (mL), inch (in), foot (ft), yard (yd), mile (mi), ounce (oz), pound (lb), cup (c), pint (pt), quart (qt), gallon (gal), fraction, numerator, denominator, operations, division/divide, mixed numbers, quotient, partition, equal parts, equivalent, factor, unit fraction,

*Basic Fact Assessment: Multiplication (factors 0-12) & Division (divisors 0-12 & quotients 0-12) - Separated*

**Standards/Objectives**

**Mastery Standards**

**Standards Clarification**

**[5-NF.7a]** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

a. 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  $(1/12) \times 4 = 1/3$

**[5-NF.7a]** Divide unit fraction by whole number (**with story context**).

**[5-NF.7b]** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

b. Interpret division of a whole number by a unit fraction, and compute such quotients.

- 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  $20 \times (1/5) = 4$

**[5-NF.7b]** Divide whole number by unit fraction (**with story context**).

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<p><b>[5-NF.7c]</b> Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</p> <p>c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole by unit fractions, e.g. by using visual fraction models and equations to represent the problem.</p> <ul style="list-style-type: none"> <li>For example, how much chocolate will each person get if 3 people share <math>\frac{1}{2}</math> lb. of chocolate equally? How many <math>\frac{1}{3}</math> cup servings are 2 cups of raisins?</li> </ul>	<p><b>[5-NF.7c]</b> Dividing fraction word problems.</p>		
<b>Supporting Standards</b>	<b>Standards Clarification</b>		
<p><b>[5-MD.1]</b> 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 multistep, real-world problems.</p>	<p><b>[5-MD.1]</b> Convert among customary units including length, weight, capacity - <b>fraction portion not covered in quarter 1.</b></p>		
<p><b>[5-MD.2]</b> Make a line plot to display a data set of measurements in fractions of a unit (<math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{8}</math>). Use operations on fractions for this grade to solve problems involving information presented in line plots.</p> <ul style="list-style-type: none"> <li>For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.</li> </ul>	<p><b>[5-MD.2]</b> This standard provides a context for students to work with fractions by measuring objects to one-eighth of a unit. This includes length, mass, and liquid volume. Students are making a line plot of this data and then adding and subtracting fractions based on data in the line plot. The line plot should also include mixed numbers in fifth grade.</p>		
<b>Resources for Quarter 3 Unit 8</b>			
<p><b>Engage New York Module 4 Topics A, E (Lessons 19 &amp; 20), G – (MD1, MD2, NF7)</b> <a href="https://www.engageny.org/resource/grade-5-mathematics-module-4">https://www.engageny.org/resource/grade-5-mathematics-module-4</a></p>	<p><b>Georgia Standards Unit 4 – (NF7)</b> <a href="https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-4.pdf">https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-4.pdf</a></p> <p><b>Unit 6 – (MD1, MD2)</b> <a href="https://www.georgiastandards.org/Georgia-Standards/Frameworks/5-Math-Unit-6.pdf">https://www.georgiastandards.org/Georgia-Standards/Frameworks/5-Math-Unit-6.pdf</a></p>	<p><b>Howard County (NF7)</b> <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-7-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-nf-dot-7-assessment-tasks</a> (MD1) <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-md-dot-1-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-md-dot-1-assessment-tasks</a> (MD2) <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-md-dot-2-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-md-dot-2-assessment-tasks</a></p>	<p><b>Math In Focus</b> <b>Chapter 4 Lessons 6-7 – (NF7)</b> <b>Chapter 15 Lesson 5 – (MD1)</b> <b>Chapter 11 Lesson 4 – (MD2)</b></p>

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**Focus Standards for Mathematical Practice**

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Qtr. 3: Weeks 7-9

February 23 – March 16 (16 days)

Grade Level 5, Unit 9: Graph on the Coordinate Plane

**UNIT OVERVIEW: GRAPH POINTS ON THE COORDINATE PLANE TO SOLVE REAL-WORLD AND MATHEMATICAL PROBLEMS**

These standards deal with only the first quadrant (positive numbers) in the coordinate plane. Although students can often “locate a point,” these understandings are beyond simple skills. For example, initially, students often fail to distinguish between two different ways of viewing the point (2, 3), say, as instructions: “right 2, up 3”; and as the point defined by being a distance 2 from the y-axis and a distance 3 from the x-axis. In these two descriptions the 2 is first associated with the x-axis, then with the y-axis. Students are given two rules and generate two numerical patterns. The graphs that are created should be line graphs to represent the pattern. This is a linear function which is why we get the straight lines.

**ESSENTIAL QUESTIONS:**

How do you name and graph points on a coordinate grid?  
 How can you find the horizontal or vertical distance between 2 ordered pairs?  
 How can you use coordinate graphs to show mathematical relationships?

**KEY VOCABULARY:**

coordinate system, coordinate plane, first quadrant, points, lines, axis/axes, x-axis, y-axis, horizontal, vertical, intersection of lines, origin, ordered pairs, coordinates, x-coordinate, y-coordinate, numerical patterns, rules

*Basic Fact Assessment: Multiplication (factors 0-12) & Division (divisors 0-12 & quotients 0-12) - Separated*

**Standards/Objectives**

**Mastery Standards**

**[5-G.2]** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

**Standards Clarification**

**[5-G.2]** Real-world and mathematical problems, including the traveling from one point to another and identifying the coordinates of missing points in geometric figures, such as squares, rectangles, and parallelograms.

**Opportunity for Depth Standards**

**[5-G.1]** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

**Standards Clarification**

**[5-G.1]** Coordinate grid (**Quadrant I only**), axes, ordered pairs, x and y.

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Additional Standards		Standards Clarification	
<p><b>[5-OA.3]</b> Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.</p>		<p><b>[5-OA.3]</b> Generate patterns w/ two rules (i.e. <math>x + 2 + 4</math>) and identify relationships between corresponding terms.</p>	
<b>Resources for Quarter 3 Unit 9</b>			
<p><b>Engage New York Module 6 Topics A, B, C, D – (G1, G2, OA3)</b>  <a href="https://www.engageny.org/resource/grade-5-mathematics-module-6">https://www.engageny.org/resource/grade-5-mathematics-module-6</a></p>	<p><b>Georgia Standards Unit 7 – (G1, G2, OA3)</b>  <a href="https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-7.pdf">https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit-7.pdf</a></p>	<p><b>Howard County (G1)</b>  <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-g-1-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-g-1-assessment-tasks</a>  <b>(G2)</b>  <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-g-2-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-g-2-assessment-tasks</a>  <b>(OA3)</b>  <a href="https://hcpss.instructure.com/courses/108/pages/5-dot-oa-dot-3-assessment-tasks">https://hcpss.instructure.com/courses/108/pages/5-dot-oa-dot-3-assessment-tasks</a></p>	<p><b>Math In Focus Chapter 11 lesson 2 (G1, G2, OA3)</b></p>
<p><b>Xtra Math</b> <a href="https://xtramath.org/#/home/index">https://xtramath.org/#/home/index</a> <i>Free, individualized web based program that helps to build student fluency.</i></p>			
<b>Focus Standards for Mathematical Practice</b>			
MP.7 Look for and make use of structure.			
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