

NJDOE MODEL CURRICULUM

CONTENT AREA: Mathematics	GRADE: 4	UNIT: # 4	UNIT NAME: Extend Understanding of Fractions, Solve Word Problems, and Introduce Decimals.
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#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Multiply a fraction by a whole number using visual fraction models and equations, demonstrating a fraction a/b as a multiple of 1/b .	4.NF.4
2	Solve 1-step word problems involving multiplication of a fraction by a whole number. <i>For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</i>	4.NF.4
3	Add two fractions with respective denominators of 10 and 100 by writing each fraction as a fraction with denominator 100.	4.NF.5
4	Use decimal notation to write fractions with denominators of 10 or 100 by writing each fraction as a fraction with denominator 100.	4.NF.6
5	Apply area and perimeter formulas for rectangles in real world math problems (whole numbers).	4.MD.3
6	Make a line plot to display a data set in measurements in fractions of a unit (1/2, 1/4, 1/8) and use it to solve problems involving addition and subtraction of fractions with like denominators.	4.MD.4
7	Compose equations from information supplied in word problems, using letters to represent unknowns in formulas, and solve the word problems (with all four operations).	4.OA.3
8	Solve word problems involving simple fractions or decimals that incorporate measurement comparisons of like units (including problems that require measurements given in a larger unit in terms of a smaller unit).	4.MD.2 4.NF.4

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).

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**UNIT NAME: Extend Understanding of Fractions,
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Selected Opportunities for Connection to Mathematical Practices

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

SLO #2 Explain the meaning and the process of finding a solution to a word problem that involves multiplication of a fraction by a whole number.

SLO #5 Analyze the relationship between area and perimeter in order to solve real world problems involving rectangles.

SLO #6 Draw diagrams and construct graphs of important features contained in a dataset.

SLO #7 Be able to explain the meaning of equations derived from word problems, and know the process involved in composing equations.

SLO #7 Explain correspondences between composed equations and information supplied in a word problem.

SLO #8 Be able to explain the meaning of fractions or decimals that incorporate measurement, and know the process to solve word problems that incorporate both.

2. Reason abstractly and quantitatively.

SLO #1 Understand and make sense of multiplied fraction quantities.

SLO #1 Use quantitative reasoning to create a coherent representation of fraction multiplication and understand the fraction quantities involved.

SLO #2 Understand and makes sense of whole number and fraction quantities in the context of multiplication.

SLO #3 Understand and make sense of fraction quantities with denominators of 10 or 100.

SLO #4 Understand and make sense of quantities expressed in decimal notation and as fractions.

SLO #6 Use and apply two abilities (making a line plot, solving addition and subtraction problems with fractions) to solve problems.

SLO #8 Understand and make sense of both decimal and fraction quantities and understand their relationship to each other.

SLO #8 Use quantitative reasoning to create a coherent representation of word problems involving fractions and decimals.

3. Construct viable arguments and critique the reasoning of others.

4. Model with mathematics.

SLO #2 Apply previously learned concepts regarding rectangles to solve area and perimeter problems involving rectangles.

SLO #6 Draw diagrams and construct graphs of important features contained in a dataset.

SLO #7 Apply previously learned concepts regarding composing equations, and all four operations.

5. Use appropriate tools strategically.

SLO #1 When multiplying fractions consider and use available tools that include equations and visual fraction models.

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<p>6. Attend to precision. SLO #4 Use clear reasoning and definitions to describe writing fractions in decimal notation. SLO #6 Specify units of measure when making a line plot from a dataset.</p> <p>7. Look for and make use of structure. SLO #1 Look for and discern patterns in the multiplication of fraction by a whole number. SLO #2 Look for and discern patterns in the multiplication of a fraction by a whole number. SLO #3 Look for and discern patterns when adding two fraction with denominators of 10 or 100. SLO #4 Look for and discern a pattern when using decimal notation to express a fraction quantity.</p> <p>8. Look for and express regularity in repeated reasoning.</p>

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

Code #	Common Core State Standards
<p>4.NF.4</p> <p>4.NF.4a</p> <p>4.NF.4b</p> <p>4.NF.4c</p>	<p>Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p> <p>a. Understand a fraction a/b as a multiple of 1/b. <i>For example, use a visual fraction model to represent 5/4 as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.</i></p> <p>b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. <i>For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as 6/5. (In general, $n \times (a/b) = (n \times a)/b$).</i></p> <p>c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. <i>For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</i></p>

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4.MD.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
4.NF.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. <i>For example, express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.</i>
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</i>
4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. <i>For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.</i>
4.MD.4	Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. <i>For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.</i>
4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

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