

MOBILE COUNTY PUBLIC SCHOOLS
 DIVISION OF CURRICULUM & INSTRUCTION
 FOURTH GRADE MATHEMATICS INSTRUCTIONAL PLANNING GUIDE
 2017-2018: QTR3

Qtr. 3: Weeks 1-3

January 4 – January 25 (15 days)

Grade 4, Unit 7: Decimal Fractions

STATE MANDATED NAEP Resources for Nonnegotiable Review Follow Unit Materials

UNIT OVERVIEW: COMPARING DECIMAL FRACTIONS AND UNDERSTANDING NOTATION

In this unit of study, students use their previous work with fractions to represent special fractions in a new way. Students use their understanding of equivalent fractions to begin to use decimal notation. However, it is not the intent at this grade level to connect this notation to the base-ten system. The focus is on solving word problems involving simple fractions or decimals. Work with money can support this work with decimal fractions.

Essential Questions

- How are fractions and decimals related?
- When you compare two decimals, how can you determine which one has the greater value?
- How can you model the multiplication of a whole number by a fraction?
- What does it mean to take a fractional portion of a whole number?

Key Vocabulary

fraction, numerator, denominator, equivalent fractions, decimals, decimal point, tenths, hundreds, multiplication, compare, >, <, =, order

Basic Fact Assessment: Division divisors 1-9 and quotients 0-9

Standards/Objectives

Mastery Standards

Standards Clarification

[4-NF.5] Express a fraction with denominator of 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. (Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.)

- Example: Express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.

[4-NF.5] Fractions with denominators of 10 equivalent to denominators of 100, add/subtract these (partition into 10 equal parts, connect to \$1, 10 cents, 1 cent).

[4-NF.6] Use decimal notation for fractions with denominators 10 or 100.

- Example: Rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.

[4-NF.6] Write fractions with denominators of 10 and 100 as decimals.

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<p>[4-NF.7] Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, $<$, and justify the conclusions, e.g., by using a visual model.</p>	<p>[4-NF.7] Compare decimals to hundredths by reasoning about size.</p>
<p>[4-OA.1] Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.</p> <ul style="list-style-type: none"> A multiplicative comparison is a situation in which one quantity is multiplied by a specified number to get another quantity (e.g., “a is n times as much as b”). Students should be able to identify and verbalize which quantity is being multiplied and which number tells how many times. 	<p>[4-OA.1] Readdressed to include multiplication of fractions and apply the understanding of “times as much”.</p>
<p>Opportunity for Depth Standards</p>	<p>Standards Clarification</p>
<p>[4-NF.4a] Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p> <p>a. Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$.</p> <ul style="list-style-type: none"> Example: Use a visual fraction model to represent $\frac{5}{4}$ as the product $5 \times \frac{1}{4}$, recording the conclusion by the equation $\frac{5}{4} = 5 \times \frac{1}{4}$. 	<p>[4-NF.4a] This standard builds on students’ work of adding fractions and extending that work into multiplication. (unit fraction)</p> <p>Example: $3/6 = 1/6 + 1/6 + 1/6 = 3 \times (1/6)$</p>
<p>[4-NF.4b] Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p> <p>b. Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number.</p> <ul style="list-style-type: none"> Example: Use a visual fraction model to express $3 \times \frac{2}{5}$ as $6 \times \frac{1}{5}$, recognizing this product as $\frac{6}{5}$. (In general, $n \times \frac{a}{b} = \frac{n \times a}{b}$.) 	<p>[4-NF.4b] This standard extends the idea of multiplication as repeated addition. For example, $3 \times (2/5) = 2/5 + 2/5 + 2/5 = 6/5 = 6 \times (1/5)$. Students are expected to use and create visual fraction models to multiply a whole number by a fraction.</p>

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<p>[4-NF.4c] Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</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.</p> <ul style="list-style-type: none"> • Example: If each person at a party will eat $\frac{3}{8}$ 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 which two whole numbers does your answer lie? 	<p>[4-NF.4c] Solve word problems with multiplying fractions by whole numbers.</p>	
<p>[4-NF.3d] Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</p>	<p>[4-NF.3d] Solve word problems with fractions (add/subtract with like denominators).</p>	
Supporting Standards	Standards Clarification	
<p>[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.</p>	<p>[4-MD.2] Word problems with distance, time, volume, money (whole, fractions and decimals).</p>	
Continued (Not New)		
<p>NF1, NF2, NF3a, NF3b, NF3c</p>	<p>Continue for reinforcement and review</p>	
Resources Qtr. 3 Unit 7		
<p>Engage New York Module 5: Review – (NF3, NF4) https://www.engageny.org/resource/grade-4-mathematics-module-5</p> <p>Module 6 Topic A, B, C, D, E - (NF4, NF5, NF6, NF7, MD2) https://www.engageny.org/resource/grade-4-mathematics-module-6</p>	<p>Georgia Unit 4 - (OA1, NF4, NF4a, NF4b, NF4c, NF3d) https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-4.pdf</p> <p>Unit 5 - (NF5, NF6, NF7, MD2) https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-5.pdf</p>	<p>Math in Focus Chapter 6 - (NF3d) Chapter 7 - (NF6, NF7) Chapter 8 Lesson 3 - (NF4C, OA1, MD2)</p>

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Focus Standards for Mathematical Practice

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

MP.7 Look for and make use of structure.

State Mandated NAEP Resources

<u>Daily Practice Items</u>	<u>Classroom Tasks</u> (Tasks are interchangeable with the practice items but do not have to be completed in the ordered listed.)	
MD Set 1, Week 1	MD Task 1- Measuring the Jump Ropes	MD Task 4 - Adding UP and Comparing Our Jumps
MD Set 2, Week 2	MD Task 2 - Shipping Packages	MD Task 5 - Area & Perimeter Exploration
MD Set 3, Week 3	MD Task 3 - Getting Ready for School	MD Task 6 - Making a Dog Pen
		MD Task 7 - How High Did it Bounce?
		MD Task 8 - Adding Up Angles

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Qtr. 3 Weeks 4-6

January 26 – February 22 (15 days)

Grade 4, Unit 8: Multiplication and Division With Larger Numbers

UNIT OVERVIEW: MULTIPLICATION AND DIVISION STRATEGIES WITH LARGER NUMBERS

In this unit students continue using computational and problem-solving strategies, with a focus on building conceptual understanding of multiplication of larger numbers and division with remainders. Area and perimeter of rectangles provide one context for developing such understanding.

Essential Questions

- How can multiplication help me to divide?
- Why is important to look for the knowns and unknowns when beginning a word problem?
- What is the meaning of a remainder in a division problem?
- How can we organize our work when solving a multi-step word problem?

Key Vocabulary

factors, multiples, product, dividend, divisor, quotient, remainder, division, properties, compare, unknown, reasonableness, estimate, round, mental computation

Basic Fact Assessment: Division divisors 1-9 and quotients 0-9

Standards/Objectives

Mastery Standards

Standards Clarification

[4-OA.2] Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

- This standard calls for students to translate comparative situations into equations with an unknown and solve.

[4-OA.2] Multiply/divide word problems, examine role of factors in different situations – all problem types – WHOLE NUMBERS ONLY; examine remainders in different types.

[4-OA.3] Solve multi-step 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.

- The focus in this standard is to have students use and discuss various strategies to solve multi-step problems with whole numbers. It refers to estimation strategies, including using compatible numbers (numbers that sum to 10 or 100) or rounding.

[4-OA.3] Multi-step problems with whole numbers (include rounding) – 3 steps, any +/- and medium mult/div.

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Opportunity for Depth Standards	Standards Clarification
<p>[4-NBT.5] Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</p> <ul style="list-style-type: none"> This standard calls for students to multiply numbers using a variety of strategies. Multiple strategies enable students to develop fluency with multiplication and transfer that understanding to division. Use of the standard algorithm for multiplication is an expectation in the 5th grade. 	<p>[4-NBT.5] Multiply 2 digits by 2 digits (using open area arrays, groups of, partial products).</p>
<p>[4-NBT.6] Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</p> <ul style="list-style-type: none"> Multi-digit division requires working with remainders. In preparation for working with remainders, students can compute sums of a product and a number, such as $4 \times 8 + 3$. In multi-digit division, students will need to find the greatest multiple less than a given number. For example, when dividing by 6, the greatest multiple of 6 less than 50 is $6 \times 8 = 48$. Students can think of these “greatest multiples” in terms of putting objects into groups. 	<p>[4-NBT.6] Divide 2, 3, and 4 digits by 1 digit (connect to multiplication); types – number of groups, size of group, examine remainders.</p>
Continued (Not New)	
OA4, NBT4 Continued for reinforcement and review	

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Resources Qtr. 2 Unit 8

<p>Engage New York Module 3 Topics H (new), Topics A, B, C, D, E, F, G (review & reinforce) - (OA2, OA3, OA4, NBT5, NBT6) https://www.engageny.org/resource/grade-4-mathematics-module-3</p> <p>FAL Multi-Digit Multiplication Strategies (NBT5) http://education.ky.gov/curriculum/connpro/Math/Documents/4_KDE_Number_and_Operations_Base_Ten_Multi-Digit_Multiplication_Strategies_Grade_4.pdf</p>	<p>Georgia Unit 2 - (OA2, OA3, OA6, NBT5) https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-2.pdf</p> <p>FAL Multi-Digit Multiplication Strategies (NBT5) http://education.ky.gov/curriculum/connpro/Math/Documents/4_KDE_Number_and_Operations_Base_Ten_Multi-Digit_Multiplication_Strategies_Grade_4.pdf</p>	<p>Illustrative Math (OA2, OA3) https://www.illustrativemathematics.org/4.OA.A (NBT4, NBT5, NBT6) https://www.illustrativemathematics.org/4.NBT.B</p> <p>FAL Multi-Digit Multiplication Strategies (NBT5) http://education.ky.gov/curriculum/connpro/Math/Documents/4_KDE_Number_and_Operations_Base_Ten_Multi-Digit_Multiplication_Strategies_Grade_4.pdf</p>	<p>Math in Focus Chapter 3 - (OA2, OA3, NBT5, NBT6)</p> <p>FAL Multi-Digit Multiplication Strategies (NBT5) http://education.ky.gov/curriculum/connpro/Math/Documents/4_KDE_Number_and_Operations_Base_Ten_Multi-Digit_Multiplication_Strategies_Grade_4.pdf</p>
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Focus Standards for Mathematical Practice

- MP.1 Make sense of problems and persevere in solving them.
- MP.2 Reason abstractly and quantitatively.
- MP.8 Look for and express regularity in repeated reasoning.

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Qtr. 3: Weeks 7-9

February 23 – March 16 (16 days)

Grade 4, Unit 9: Measurement

UNIT OVERVIEW: INTRODUCING MEASUREMENT CONVERSIONS

In this unit students build a conceptual understanding of the relative sizes of units of measure within a single system of measurement. Measurement conversions are using multiplicative comparison.

Essential Questions

- Why are units important in measurement?
- How do we use length, weight, and volume measurement?
- How do you convert between units of measurement?
- Can different size containers have the same capacity?

Key Vocabulary

measure, length, capacity, volume, mass, weight, metric, centimeter (cm), meter (m), kilometer (km), gram (g), kilogram (kg), milliliter (mL), liter (L), customary, inch (in), foot (ft), yard (yd), mile (mi), cup (c), pint (pt), quart (qt), gallon (gal), ounce (oz), pound (lb), ton (T), decompose

Basic Fact Assessment: Division divisors 1-9 and quotients 0-9

Standards/Objectives

Mastery Standards

[4-OA.1] Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

- A multiplicative comparison is a situation in which one quantity is multiplied by a specified number to get another quantity (e.g., “a is n times as much as b”). Students should be able to identify and verbalize which quantity is being multiplied and which number tells how many times.

Standards Clarification

[4-OA.1] Multiplicative comparison applied in 4.MD.1

Example: 1 ft. is 12 times as long as 1 in.

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Opportunity for Depth Standards	Standards Clarification
<p>[4-MD.1] Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; and hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.</p> <ul style="list-style-type: none"> • Examples: Know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36) • Students need to understand customary units and the metric system. To convert from one unit to another unit, either multiply or divide. To change from a greater unit to a lesser unit (i.e. foot to inches), multiply. To change from a smaller unit to a larger unit, divide. 	<p>[4-MD.1] Multiplicative comparison with measurement; students need ample opportunities to become familiar with these new units of measure and explore the patterns and relationships in conversion tables that they create.</p>
<p>[4-MD.3] Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.</p> <ul style="list-style-type: none"> • 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. • Students learn to apply understandings and formulas to the solution of real-world and mathematical problems. 	<p>[4-MD.3] Apply area/perimeter formula in real-life situations.</p>
Supporting Standards	Standards Clarification
<p>[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.</p>	<p>[4-MD.2] Word problems with distance, time, volume, and money (whole numbers, fractions and decimals).</p>

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Additional		Standards Clarification	
<p>[4-OA.5] Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.</p> <ul style="list-style-type: none"> Patterns involving numbers either repeat or grow. Patterns and rules are related. A pattern is a sequence that repeats the same process over and over. A rule dictates what that process will look like. Students investigate different patterns to find rules, identify features in the patterns, and justify the reason for those features. 		<p>[4-OA.5] Number patterns for a rule.</p>	
Continued (Not New)			
NBT1, NBT2, NBT3		Continue for reinforcement and review	
Resources Qtr. 3 Unit 9			
<p>Engage New York Module 7 Topics A, B, & C - (OA1, MD1, MD2) https://www.engageny.org/resource/grade-4-mathematics-module-7</p> <p>Module 5 Topic H - (OA5) https://www.engageny.org/resource/grade-4-mathematics-module-5</p>	<p>Georgia Unit 7 - (MD1, MD2, MD3, OA1) https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th_Math-Unit-7.pdf</p>	<p>Howard County MD1 https://hcpss.instructure.com/courses/107/pages/4-dot-md-dot-1-assessment-tasks</p> <p>MD2 https://hcpss.instructure.com/courses/107/pages/4-dot-md-dot-2-assessment-tasks</p> <p>MD3 https://hcpss.instructure.com/courses/107/pages/4-dot-md-dot-3-assessment-tasks</p>	<p>Math in Focus Chapter 12 - (MD3)</p>
<p>Xtra Math http://xtramath.org/#/home/index <i>Free, individualized web based program that helps to build student fluency.</i></p>			
Focus Standards for Mathematical Practice			
MP.2 Reason abstractly and quantitatively.			
MP.6 Attend to precision.			
MP.7 Look for and make use of structure.			