MOBILE COUNTY PUBLIC SCHOOLS
DIVISION OF CURRICULUM & INSTRUCTION
FOURTH GRADE MATHEMATICS INSTRUCTIONAL PLANNING GUIDE
2017-2018: QTR2

Qtr. 2: Weeks 1-3
October 10 – October 27 (14 days)
Grade 4, Unit 4: Multiplication and Division of Whole Numbers

STATE MANDATED NAEP Resources for Nonnegotiable Review Follow Unit Materials

UNIT OVERVIEW: USING 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	**Key Vocabulary**
How do multiplication and division relate to each other? How can you use multiplication facts to help solve division problems? How do you know if a number is prime or composite? What strategies can be used to solve patterns? How is perimeter different from area?	commutative property of multiplication, distributive property, associative property of multiplication, decompose, unknown variable, prime, composite, multiplicative comparison, multiply, factors, multiples, product, partial product, divide, divisor, dividend, quotient, remainder, inverse operation, reasonableness, mental computation, estimation, rounding, area, perimeter, pattern, rule

Basic Fact Assessment: Multiplication Factors 0-9

Standards/Objectives

Mastery Standards	**Standards Clarification**
[4-OA.1] Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 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.	**[4-OA.1]** Multiplicative comparison (use language) Examples: 1 thousand is 10 times as much as 1 hundred 42 is 7 times as many as 6 and 6 times as many as 7
[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]** Multiplication and division word problems, examine role of factors in different situations – all problem types -WHOLE NUMBERS ONLY (examine zero in different places).

[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. • The focus in this standard is to have students use and discuss various strategies to solve multistep 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]** Multistep problems with whole numbers (include rounding); 2 to 3 steps, 1 +/- and 1 easy/medium multiply or divide.
Opportunity for Depth Standards	**Standards Clarification**
[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. • Understand the role played by the distributive property. This allows numbers to be decomposed into base-ten units, products of the units to be computed, and then combined. By decomposing the factors into like base-ten units and applying the distributive property, multiplication computations are reduced to single-digit multiplications and products of numbers with multiples of 10, of 100, and of 1000. Students can connect diagrams of areas or arrays to numerical work to develop understanding of general base-ten multiplication methods. 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.**	**[4-NBT.5]** Multiply 3 & 4 digits by 1 digit second qtr. (use open area, partial product, connect to known facts).

[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. • General methods for computing quotients of multi-digit numbers and one-digit numbers rely on the same understandings as for multiplication, but cast in terms of division. One component is quotients of multiples of 10, 100, or 1000 and one-digit numbers. *For example, 42 ÷ 6 is related to 420 ÷ 6 and 4200 ÷ 6.* Students can draw on their work with multiplication and they can also reason that 4200 ÷ 6 means partitioning 42 hundreds into 6 equal groups, so there are 7 hundreds in each group. Another component of understanding general methods for multi-digit division computation is the idea of decomposing the dividend into like base-ten units and finding the quotient unit by unit, starting with the largest unit and continuing on to smaller units. As with multiplication, this relies on the distributive property.	**[4-NBT.6]** Divide 2, 3, & 4 digits by 1 digit (connect to multiplication, use models, examine cases w/zero); types – number of groups, size of group, examine remainders.
[4-MD.3] Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. • 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. • The formula for the area of a rectangle, A = l x w, is a generalization of the understanding, that, given a unit of length, a rectangle whose sides have length w units and l units, can be partitioned into w rows of unit squares with l squares in each row. The product l x w gives the number of unit squares in the partition, thus the area measurement is l x w square units. • Students generate and discuss advantages and disadvantages of various formulas for the perimeter length of a rectangle that is l units by w units. For example, P = 2l + 2w has two multiplications and one addition, but P = 2(l + w), which has one addition and one multiplication, involves fewer calculations.	**[4-MD.3]** Apply area/perimeter formula in real-life situations.

Supporting Standards	Standards Clarification
[4-OA.4] Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite. • Students should understand the process of finding factor pairs so they can do this for any number 1 – 100. o Example: Factor pairs for 96: 1 and 96, 2 and 48, 3 and 32, 4 and 24, 6 and 16, 8 and 12. • Multiples can be thought of as the result of skip counting by each of the factors. When skip counting, students should be able to identify the number of factors counted e.g., 5, 10, 15, 20 (there are 4 fives in 20). o Example: Factors of 24: 1, 2, 3, 4, 6, 8,12, 24 Multiples: 1, 2, 3, 4, 5…24 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 3, 6, 9, 12, 15, 18, 21, 24 4, 8, 12, 16, 20, 24 8, 16, 24 12, 24 24	**[4-OA.4]** Factor pairs/prime/composite; examine all numbers through 100.
Additional	**Standards Clarification**
[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. • Numerical patterns allow students to reinforce facts and develop fluency with operations. • 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.	**[4-OA.5]** Number patterns for a rule in multiplicative situations. (i.e. 6x7, 6x70, 6x700)

Continued (Not New)			
NBT1, NBT2, NBT3, NBT4 Continue for reinforcement and review			
Resources Qtr. 2 Unit 4			
Engage New York Module 3 Topics A, B, C, D, E, F, G - (NBT1, NBT5, NBT6, OA1, OA2, OA3, OA4, MD3) https://www.engageny.org/resource/grade-4-mathematics-module-3	**Georgia Standards Unit 2 - (OA1, OA2, OA3, OA4, NBT4, NBT5, NBT6)** https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-2.pdf	**North Carolina** **OA1: Task 2, OA2: Tasks3-4, OA3: Tasks 1-3** http://3-5cctask.ncdpi.wikispaces.net/4.OA.1-4.OA.3 **NBT5: Task 2, NBT6: Tasks 2-3** http://3-5cctask.ncdpi.wikispaces.net/4.NBT.4-4.NBT.6 **OA 4: Task 3** http://3-5cctask.ncdpi.wikispaces.net/4.OA.4	**Math in Focus** **Chapter 2, Lessons 2 & 3 - (OA4)** **Chapter 3, Lessons 1, 3, & 4 - (NBT5, NBT6)**
FAL: ***Number Puzzles; Factors and Multiples*** **- (OA4)** http://education.ky.gov/curriculum/conpro/Math/Documents/4_KDE_Operations_and_Algebraic_Thinking_Factors_and_Multiples_Number_Puzzles_Grade_4.pdf	**FAL:** ***Number Puzzles; Factors and Multiples*** **- (OA4)** http://education.ky.gov/curriculum/conpro/Math/Documents/4_KDE_Operations_and_Algebraic_Thinking_Factors_and_Multiples_Number_Puzzles_Grade_4.pdf	**FAL:** ***Number Puzzles; Factors and Multiples*** **- (OA4)** http://education.ky.gov/curriculum/conpro/Math/Documents/4_KDE_Operations_and_Algebraic_Thinking_Factors_and_Multiples_Number_Puzzles_Grade_4.pdf	**FAL:** ***Number Puzzles; Factors and Multiples*** **- (OA4)** http://education.ky.gov/curriculum/conpro/Math/Documents/4_KDE_Operations_and_Algebraic_Thinking_Factors_and_Multiples_Number_Puzzles_Grade_4.pdf
Xtra Math http://xtramath.org/#/home/index *Free, individualized web based program that helps to build student fluency.*			
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.			

State Mandated NAEP Resources		
Daily Practice Items NBT Set 1, Week 1 NBT Set 2, Week 2 NBT Set 3, Week 3	**Classroom Tasks** (Tasks are interchangeable with the practice items but **do not** have to be completed in the ordered listed.) Task 1- Packaging Soup Cans Task 2 -Thousands and Millions of Fourth Graders	Task 3 - Planning a Pizza Party Task 4 - Who Has a Bigger Garden? Task 5 - College Basketball Attendance Task 6 - Dividing by Multiples of Ten Task 7 – Packaging Cupcakes

Qtr. 2: Weeks 4-6
October 30 – November 17 (14 days)
Grade 4, Unit 5: Fraction Equivalence, Ordering, and Operations

STATE MANDATED NAEP Resources for Nonnegotiable Review Follow Unit Materials

UNIT OVERVIEW: EXTEND UNDERSTANDING OF FRACTION EQUIVALENCE AND ORDERING

In this unit students extend their prior knowledge of unit fractions with denominators of 2, 3, 4, 6, and 8 from Grade 3 to include denominators of 5, 10, 12, and 100. Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g., $\frac{15}{9} = \frac{5}{3}$), and they develop methods for generating and recognizing equivalent fractions.

Essential Questions	**Key Vocabulary**
How do you know fractions are equivalent? How can you use models to show equivalent fractions? What are different strategies for comparing and ordering fractions? How are benchmark fractions helpful when comparing fractions? How do I compare fractions with unlike denominators? How do we make a line plot to display a data set?	whole number, fraction, unit fraction, numerator, denominator, common denominator, benchmark fraction, equivalent, data, line plot, length comparison/compare, >, <, =

Basic Fact Assessment: Multiplication Factors 0-9

Standards/Objectives

Mastery Standards	**Standards Clarification**
[4-NF.2] Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. • This standard calls students to compare fractions by creating visual fraction models or finding common denominators or numerators. Students' experiences should focus on visual fraction models rather than algorithms. When tested, models may or may not be included. Students should learn to draw fraction models to help them compare. Students must also recognize that they must consider the size of the whole when comparing fractions (i.e., $\frac{1}{2}$ and $\frac{1}{8}$ of two medium pizzas is very different from $\frac{1}{2}$ of one medium and $\frac{1}{8}$ of one large).	**[4-NF.2]** Compare using benchmarks and visual models.

Opportunity for Depth Standards	Standards Clarification
[4-NF.1] Explain why a fraction is equivalent to a fraction by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. • This standard refers to visual fraction models. This includes area models, number lines or it could be a collection/set model. It addresses equivalent fractions by examining the idea that equivalent fractions can be created by multiplying both the numerator and denominator by the same number or by dividing a shaded region into various parts.	**[4-NF.1]** Equivalent fractions. (incorporate comparison of =) Students should begin to notice connections between the models and fractions in the way both the parts and wholes are counted and begin to generate a rule for writing equivalent fractions.
Additional	**Standards Clarification**
[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. • Example: From a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection. • This standard provides a context for students to work with fractions by measuring objects to an eighth of an inch. Students are making a line plot of this data and then adding and subtracting fractions based on data in the line plot.	**[4-MD.4]** Line plot data for measurement in fractions, use to solve addition and subtraction.

Resources Qtr. 2 Unit 5			
Engage New York Module 5 Topics B, C, E (Lesson 28) - (NF1, NF2, MD4) https://www.engageny.org/resource/grade-4-mathematics-module-5	**Georgia Standards Unit 3 - (NF1, NF2)** https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-3.pdf	**North Carolina** **NF1: Tasks 1-2, NF 2: Tasks 1-2** http://3-5cctask.ncdpi.wikispaces.net/4.NF.1-4.NF.2 **MD 4: Tasks 1-3** http://3-5cctask.ncdpi.wikispaces.net/4.MD.4	**Math in Focus – NA** **Howard County (MD4)** https://hcpss.instructure.com/courses/107/pages/4-dot-md-dot-4-assessment-tasks
Xtra Math http://xtramath.org/#/home/index *Free, individualized web based program that helps to build student fluency.*			

Focus Standards for Mathematical Practice
MP.4 Model with mathematics.
MP.8 Look for and express regularity in repeated reasoning.

State Mandated NAEP Resources		
Daily Practice Items	**Classroom Tasks** (Tasks are interchangeable with the practice items but **do not** have to be completed in the ordered listed.)	
OA Set, Week 4	OA Task 1 - Comparing Money Raised	NF Task 1- Splitting to make Equivalent Fractions
NF Set, Week 5	OA Task 2 - How Many Teams?	NF Task 2 - Weird pieces of Cake
Week 6 – finish tasks	OA Task 3 - A Ride On a Bus	NF Task 3 - Who Has More Gum?
	OA Task 4 - Arranging Chairs	NF Task 4 - Boxing Up Leftover Brownies
	OA Task 5 - Table Dilemma	NF Task 5 - Pasta Party
	OA Task 6 - Lawn Mowing Business	NF Task 6 - Chris's Cookies

Qtr. 2: Weeks 7-9
November 27 – December 15 (15 days)
Grade 4, Unit 6: Building Fractions from Unit Fractions

STATE MANDATED NAEP Resources for Nonnegotiable Review Follow Unit Materials

UNIT OVERVIEW: BUILD FRACTIONS FROM UNIT FRACTIONS BY APPLYING AND EXTENDING PREVIOUS UNDERSTANDINGS OF OPERATIONS ON WHOLE NUMBERS

In this unit students use their understanding of partitioning to find unit fractions to compose and decompose fractions in order to add fractions with like denominators. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

Essential Questions	**Key Vocabulary**
How do we add fractions with like denominators? Why does the denominator remain the same when you add fractions? How can you model the multiplication of a whole number by a fraction? How can you rename mixed numbers as a fraction greater than 1?	addition/joining, subtraction/separating, operations, equivalent, multiple, reasonable, decomposing, fraction, unit fraction, fraction greater than 1, mixed number, whole number, multiply, compose, decompose

Basic Fact Assessment: Multiplication Factors 0-9

Standards/Objectives

Mastery Standards	**Standards Clarification**
[4-OA.1] Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 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.	**[4-OA.1]** Readdressed to include multiplication of fractions and apply the understanding of **“times as much”** in word problems.

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Opportunity for Depth Standards	Standards Clarification
[4-NF.3a] Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. • . Example: $1\frac{1}{4} - \frac{3}{4} = \square$ $\frac{4}{4} + \frac{1}{4} = \frac{5}{4}$ $\frac{5}{4} - \frac{3}{4} = \frac{2}{4}$ or $\frac{1}{2}$	**[4-NF.3a]** Add/subtract fractions with like denominators. Understand unit fractions to be able to compose and decompose fractions • A fraction with a numerator of one is called a unit fraction. When students investigate fractions other than unit fractions, such as $\frac{2}{3}$, they should be able to join (compose) or separate (decompose) the fractions of the same whole.
[4-NF.3b] Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. • Examples: $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$; $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$; $2\frac{1}{8} = 1 + 1 + \frac{1}{8}$; $2\frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$.	**[4-NF.3b]** Students should justify their breaking apart (decomposing) of fractions using visual fraction models. The concept of turning mixed numbers into fractions greater than one needs to be emphasized using visual fraction models.
[4-NF.3c] Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$. c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.	**[4-NF.3c]** Add/subtract mixed numbers with like denominators.
[4-NF.3d] Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$. d. 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.	**[4-NF.3d]** Solve word problems with fractions. (add/subtract with like denominators)
[4-NF.4a] Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. • 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 $\frac{5}{4} = 5 \times \frac{1}{4}$.	**[4-NF.4a]** This standard builds on students' work of adding fractions and extending that work into multiplication. (unit fraction) Example: 3/6 = 1/6 + 1/6 + 1/6 = 3 x (1/6)

[4-NF.4b] Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. 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. • 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, $n \times \frac{a}{b} = \frac{nxa}{b}$.)	**[4-NF.4b]** This standard extends the idea of multiplication as repeated addition. For example, 3 x (2/5) = 2/5 + 2/5 + 2/5 = 6/5 = 6 x (1/5). Students are expected to use and create visual fraction models to multiply a whole number by a fraction.
[4-NF.4c] Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. 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. • 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?	**[4-NF.4c]** Solve word problems with multiplying fractions by whole numbers

Resources Qtr. 2 Unit 6			
Engage New York Module 5 Topics A, D, E (Lessons 22-27), F (Lessons 30-34), Topic G (Lessons 35-36) - (NF3, NF3A, NF3B, NF3C, NF3D, NF4, NF4A) **https://www.engageny.org/resource/grade-4-mathematics-module-5**	**Georgia Standards Unit 4 - (NF3, NF4)** **https://www.georgiastandards.org/Georgia-Standards/Frameworks/4th-Math-Unit-4.pdf**	**Illustrative Math – (NF3)** **https://www.illustrativemathematics.org/4.NF.B.3**	**Math in Focus** **Chapter 6, lessons 1-8 - (NF3, NF4)**
Xtra Math **http://xtramath.org/#/home/index** *Free, individualized web based program that helps to build student fluency.*			

Focus Standards for Mathematical Practice
MP.1 Make sense of problems and persevere in solving them.
MP.4 Model with mathematics.
MP.6 Attend to precision.

State Mandated NAEP Resources		
<u>Daily Practice Items</u> G Set 1, Week 7 G Set 2, Week 8 Week 9 – finish tasks	**<u>Classroom Tasks</u>** (Tasks are interchangeable with the practice items but **do not** have to be completed in the ordered listed.) G Task 1 – What's the Point? G Task 2 – Moving Around Town G Task 3 – Making Roads	G Task 4 – Sorting Quadrilateral Cards G Task 5 – Right Triangles G Task 6 - Trapezoids G Task 7- Symmetrical Letters