Monroe County School System
Math Pacing Guide – Grade 4

Overview Grade 4

Operations and Algebraic Thinking [OA]

- Use the four operations with whole numbers to solve problems.
- Gain familiarity with factors and multiples.
- Generate and analyze patterns.

Number and Operations in Base Ten [NBT]

- Generalize place value understanding for multi-digit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations – Fractions [NF]

- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- Understand decimal notation for fractions, and compare decimal fractions.

Measurement and Data [MD]

- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller one.
- Represent and interpret data.
- Geometric measurement: understand concepts of angle and measure angles.

Geometry [G]

- Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Standards for Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Note: "I Can" statements can be found at the end of this document.

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Taught	Unit	2013 Alabama Course of Study Standards	Resource: enVision Math Common Core 2012	Vocabulary	Tested
1st Nine Weeks	Place Value	**Generalize place value understanding for multi-digit whole numbers**			
		6. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. **[4-NBT1]**	**Topic 3** Place Value		October
		7. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. **[4-NBT2]**			October
		8. Use place value understanding to round multi-digit whole numbers to any place. **[4-NBT3]**			October
	Adding and Subtracting Whole Numbers	**9.** Fluently add and subtract multi-digit whole numbers using the standard algorithm. **[4-NBT4]**	**Topic 4** Addition and Subtraction of Whole Numbers		October (Test Addition and Subtraction Only)
		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**. [4-OA5]**	**Topic 2** Generate and Analyze Patterns		October
		Use place value understanding and properties of operations to perform multi-digit arithmetic.			
	Introduction to Multiplying Whole Numbers	**10.** 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. **[4-NBT5]**	**Topic 1** Multiplication & Division: Meanings and Facts **Topic 5** Number Sense: Multiplying by 1-Digit Numbers **Topic 6** Developing Fluency: Multiplying by 2-Digit Numbers		October (Test Multiplication Only)

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Taught	Unit	2013 Alabama Course of Study Standards	Resource: enVision Math Common Core 2012	Vocabulary	Tested
1st Nine Weeks	Introduction to Multiplying Whole Numbers	**Use the four operations with whole numbers to solve problems.**			
		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**. [4-OA1]**	**Topic 5** Number Sense: Multiplying by 1-Digit Numbers		October
		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. (See Appendix A, Table 2.) **[4-OA2]**			October (Test Multiplication Only)
		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. **[4-OA3]**			October (Test Addition, Subtraction, Multiplication Only)
		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. **[4-OA4]**			October
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Taught	Unit	2013 Alabama Course of Study Standards	Resource: enVision Math Common Core 2012	Vocabulary	Tested
2nd Nine Weeks	Multiplying and Dividing Whole Numbers	**Generalize place value understanding for multi-digit whole numbers.**			
		6. Recognize that in a multi-digit whole number, a digit in ones place represents ten times what it represents in the place to its right. **[4-NBT1]**	**Topic 3** Place Value		October
		8. Use place value understanding to round multi-digit whole numbers to any place. **[4-NBT3]**			October
		Use place value understanding and properties of operations to perform multi-digit arithmetic			
		10. 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. **[4-NBT5]**	**Topic 7** Number Sense: Multiplying by 2-Digit Numbers **Topic 8** Developing Fluency: Multiplying by 2-Digit Numbers		October
		11. 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. **[4-NBT6]**	**Topic 9** Number Sense: Dividing by 1-Digit Divisors **Topic 10** Developing Fluency: Dividing by 1-Digit Divisors		October

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Taught	Unit	2013 Alabama Course of Study Standards	Resource: enVision Math Common Core 2012	Vocabulary	Tested
2nd Nine Weeks	Multiplying and Dividing Whole Numbers	**Gain familiarity with factors and multiples.**			
		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. **[4-OA4]**	**Topic 2:** Generate Patterns		October
		Use the four operations with whole numbers to solve problems.			
		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**. [4-OA1]**			October
		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. (See Appendix A, Table 2.) **[4-OA2]**			October
		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. **[4-OA3]**			October

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Taught	Unit	2013 Alabama Course of Study Standards	Resource: enVision Math Common Core 2012	Vocabulary	Tested
2nd Nine Weeks	Fractions Limited to Denomina-tors of 2, 3, 4, 5, 6, 8, 10, 12, and 100	**Extend understanding of fraction equivalence and ordering.**			
		12. Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $(\frac{(n\ x\ a)}{(n\ x\ b)})$ 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**. [4-NF1]** **13.** 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. **[4-NF2]**	**Topic 11** Fraction Equivalence and Ordering		March (Do not test until 3rd Nine Weeks.) March
		Gain familiarity with factors and multiples; Generate and analyze patterns.			
		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**. [4-OA4]** **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. **[4-OA5]**			October October
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Taught	Unit	2013 Alabama Course of Study Standards	Resource: enVision Math Common Core 2012	Vocabulary	Tested
3rd Nine Weeks	Adding and Subtracting Fractions (with like denomi-nators)	**Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers**			
		14. Understand a fraction $\frac{a}{b}$ with a > 1 as a sum of fractions $\frac{1}{b}$. **[4-NF3]** **a**. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. **[4-NF3a]** **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. **[4-NF3b]** **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-NF3c]** **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-NF3d]**	**Topic 12** Adding and Subtracting Fractions & Mixed Numbers with Like Denominators		March
	Multiplying Fractions and Understand Decimals Multiply a fraction by a whole number.	**15.** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number**. [4-NF4]** **a.** Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. **[4-NF4a]** **b**. Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. **[4-NF4b]** **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. **[4-NF4c]**	**Topic 13** Extending Fraction Concepts		March

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Taught	Unit	2013 Alabama Course of Study Standards	Resource: enVision Math Common Core 2012	Vocabulary	Tested
3rd Nine Weeks	Multiplying Fractions and Understand Decimals Multiply a fraction by a whole number.	**Understand decimal notation for fractions, and compare decimal fractions.**			
		16. 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. (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.) **[4-NF5]**	**Topic 13** Extending Fraction Concepts		March
		17. Use decimal notation for fractions with denominators 10 or 100. **[4-NF6]**			March
		18. 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 >, =, or <, and justify the conclusions, e.g., by using a visual model. **[4-NF7]**			March
	Angles and Measure-ment	**Draw and identify lines and angles, and classify shapes by properties of their lines and angles.**			
		26. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures**. [4-G1]**	**Topic 16** Lines, Angles, and Shapes		May
		27. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles**. [4-G2]**			May
	Draw Lines of Symmetry	**28.** Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. **[4-G3]**			May

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Taught	Unit	2013 Alabama Course of Study Standards	Resource: enVision Math Common Core 2012	Vocabulary	Tested
4th Nine Weeks	Angles and Measure-ment	**Geometric measurement: understand concepts of angle and measure angles.**			
		23. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. **[4-MD5]** **a.** An angle is measured with reference to a circle with its center at the common endpoint of the rays by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a "one-degree angle" and can be used to measure angles. **[4-MD5a]** **b.** An angle that turns through *n* 1-degree angles is said to have an angle measure of *n* degrees. **[4-MD5b]**	**Topic 16** Lines, Angles, and Shapes		May
	Measure angles with a protractor	**24.** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. **[4-MD6]**			May
		25. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real-world or mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure. **[4-MD7]**			May

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4th Nine Weeks	Measure-ment and Conversion	**Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.**			
		19. 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. **[4-MD1]**	**Topic 14** Measurement Units and Conversions		May
	Measure-ment within one system of measure-ment	**20.** 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-MD2]**	**Topic 15** Solving Measurement Problems		May
	Area and Perimeter formulas	**21**. Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. **[4-MD3]**			May
		Represent and interpret data.			
		22. 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. **[4-MD4]**	**Topic 15** Solving Measurement Problems		May
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Assessment Schedule							
October (end of 1st Nine Weeks)		**December** (end of 2nd Nine Weeks)		**March** (end of 3rd Nine Weeks)		**May** (end of 4th Nine Weeks)	
AL COS	Common Core	AL COS	Common Core	AL COS	Common Core	AL COS	Common Core
1	[4-OA1]	1	[4-OA1]	12	[4-NF1]	19	[4MD1]
2	[4-OA2]-multiplication only	2	[4-OA2]	13	[4-NF2]	20	[4-MD2]
		3	[4-OA3]	14	[4-NF3]	21	[4-MD3]
3	[4-OA3]-adding, subtraction, & multiplication only	4	[4-OA4]	14a	[4-NF3a]	22	[4-MD4]
		5	[4-OA5]	14b	[4-NF3b]	23	[4-MD5]
		6	[4-NBT1]	14c	[4-NF3c]	23a	[4-MD5a]
		8	[4-NBT3]	14d	[4-NF3d]	23b	[4-MD5b]
4	[4-OA4]	10	[4-NBT5]	15	[4-NF4]	24	[4-MD6]
5	[4-OA-5]	11	[4-NBT6]	15a	[4-NF4a]	25	[4-MD7]
6	[4-NBT1]	13	[4-NF2]	15b	[4-NF4b]	26	[4-G1]
7	[4-NBT2]			15c	[4-NF4c]	27	[4-G2]
8	[4-NBT3]			16	[4-NF5]	28	[4-G3]
9	[4-NBT4]-adding & subtraction only			17	[4-NF6]		
				18	[4-NF7]		
10	[4-NBT5]-multiplication only						

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AL COS Standard	"I Can" Statements
1	--solve problems involving multiplicative comparison and additive comparisons.
2	--multiply tens, hundreds, and thousands by whole numbers.
3	--use remainders to solve division problems. --use compatible numbers to estimate quotients.
4	--find factor pairs for whole numbers 1-100. --recognize a whole number as a multiple of each of its factors. --decide whether a whole number (1-100) is a multiple of a given one-digit number. --determine if a whole number (1-100) is prime or composite.
5	--create a number or shape pattern that follows a given rule. --identify characteristics about the pattern that are not part of the rule.
6	--read and write whole numbers in standard form, word form, and expanded form.
7	--compare and order whole numbers based on values of the digits in each number.
8	--round a whole number to any place.
9	--add whole numbers.
10	--subtract whole numbers.
11	--apply strategies to find whole number quotients and remainders with up to four-digit dividends and one-digit divisors. --represent the calculation using an equation, rectangular array, and/or area models.
12	--explain why fractions are equivalent using fraction models. --recognize and create equivalent fractions
13	--compare two fractions with different numerators and denominators using <, >, and =. --show the comparison using a fraction model from the same whole. --prove my comparisons using a fraction model.
14	--add fractions. --subtract fractions. --break apart a fraction into a sum of fractions with the same denominator in more than one way. --record each sum of fractions using an equation. --prove my equation using a fraction model. --add mixed numbers with like denominators. --subtract mixed numbers with like denominators. --solve word problems using addition of fractions with the same denominator. --solve word problems using subtraction of fractions with the same denominator

15	--use a visual fraction model to show that fractions have multiples. --use a fraction model to multiply a fraction by a whole number. --use fraction models to solve word problems involving multiplication of a fraction by a whole number.
16	--make an equivalent fraction for tenths as hundredths. --make an equivalent fraction for tenths as hundredths; therefore, I can add fractions for tenths and hundredths**.**
17	--use decimal notation for fractions with denominators 10 or 100.
18	--compare two decimals to hundredths according to their size using >, <, =. --show the comparison when the two decimals are from the same whole. --prove the results using a visual model.
19	--determine the relative sizes of measurement within one system of units. --express measurements in a larger unit in terms of a smaller unit. --record the measurement equivalents in a two-column table.
20	**--**use the four operations to solve word problems including distance, time, volume, mass, and money. --express measurements in a larger unit in terms of smaller units using simple fractions or decimals. --represent measurement quantities using diagrams such as a number line diagram.
21	--use the area and perimeter formulas in real world and math problems.
22	--make a line plot using fractional units. --use the line plot information to solve problems by adding and subtracting fractions.
23	--show what a degree is within a circle. --use degrees to measure angles.
24	--read the degree of an angle.
25	--recognize the sum of the angle parts is equal to the whole angle. --solve addition and subtraction problems with unknown angles on a diagram. --recognize the sum of the angle parts is equal to the whole angle. --solve addition and subtraction problems with unknown angles on a diagram.
26	--draw geometric figures. --use two-dimensional figures to identify geometric terms.
27	--classify two-dimensional figures based on parallel or perpendicular lines and angle size. --recognize and identify right triangles.
28	--recognize a line of symmetry. --identify a figure with a line of symmetry. --draw a line of symmetry.