

# Monroe County Schools

## Math Pacing Guide – Grade 5

### Grade 5 Overview

#### Content Standard Domains and Clusters

#### Operations and Algebraic Thinking [OA]

- Write and interpret numerical expressions.
- Analyze patterns and relationships.

#### Number and Operations in Base Ten [NBT]

- Understand the place value system.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.

#### Number and Operations – Fractions [NF]

- Use equivalent fractions as a strategy to add and subtract fractions.
- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

#### Measurement and Data [MD]

- Convert like measurement units within a given measurement system.
- Represent and interpret data.
- Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

#### Geometry [G]

- Graph points on the coordinate plane to solve real-world and mathematical problems.
- Classify two-dimensional figures into categories based on their properties.

#### 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.

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1 <sup>st</sup> Nine Weeks	<b>Understand the place value system.</b>				
	<p><b>4.</b> Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and <math>\frac{1}{10}</math> of what it represents in the place to its left. <b>[5-NBT1]</b></p> <p><b>18.</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. <b>[5-MD1]</b></p>	<p><b>Topic 1:</b> Place Value</p> <p><b>Note:</b> Teach metric conversion only at this time.</p>	Investigations Units 3 and 6		October
	<p><b>5.</b> Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. <b>[5-NBT2]</b></p>	<p><b>Topic 6:</b> Multiplying Decimals</p>	Investigations Units 1 and 6		October
	<p><b>6.</b> Read, write, and compare decimals to thousandths. <b>[5-NBT3]</b></p> <p><b>a.</b> Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., <math>347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (\frac{1}{10}) + 9 \times (\frac{1}{100}) + 2 \times (\frac{1}{1000})</math>. <b>[5-NBT3a]</b></p> <p><b>b.</b> Compare two decimals to thousandths based on meanings of the digits in each place, using &gt;, =, and &lt; symbols to record the results of comparisons. <b>[5-NBT3b]</b></p>				October <b>(Note:</b> Test metric conversion only)

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<b>1<sup>st</sup> Nine Weeks</b>	<p><b>7.</b> Use place value understanding to round decimals to any place. <b>[5-NBT4]</b></p> <p><b>10.</b> Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method, and explain the reasoning used. <b>[5-NBT7]</b></p>	<p><b>Topic 2:</b> Adding and Subtracting Decimals</p> <p><b>Topic 6:</b> Multiplying Decimals</p> <p><b>Topic 7:</b> Dividing Decimals</p>			<p>October</p> <p>October (<b>Note:</b> Test whole numbers only)</p>
	<b>Perform operations with multi-digit whole numbers and with decimals to hundredths.</b>				
	<p><b>8.</b> Fluently multiply multi-digit whole numbers using the standard algorithm. <b>[5-NBT5]</b></p> <p><b>22.</b> Relate volume to the operations of multiplication and addition, and solve real-world and mathematical problems involving volume. <b>[5-MD5]</b></p> <p><b>b.</b> Apply the formulas <math>V = l \times w \times h</math> and <math>V = B \times h</math> for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. <b>[5-MD5b]</b></p>	<p><b>Topic 3:</b> Multiplying Whole Numbers</p> <p><b>Note:</b> Teach <math>L \times W \times H</math> at this time.</p>	Investigations Units 1, 2, 3, 6, 7, and 9		<p>October</p> <p>October (<b>Note:</b> Test <math>L \times W \times H</math> only)</p>

**Monroe County Schools**  
**Math Pacing Guide – Grade 5**

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<b>1<sup>st</sup> Nine Weeks</b>	9. Find whole-number quotients of whole numbers with up to four-digit dividends and two-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. <b>[5-NBT6]</b>	<b>Topic 4:</b> Dividing by 1-Digit Divisors <b>Topic 5:</b> Dividing by 2-Digit Divisors			October
Notes:					

**Monroe County Schools**  
**Math Pacing Guide – Grade 5**

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<b>2<sup>nd</sup> Nine Weeks</b>	<b>Perform operations with multi-digit whole numbers and with decimals to hundredths.</b>				
	<b>10.</b> Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method, and explain the reasoning used. <b>[5-NBT7]</b>	<b>Topic 6:</b> Multiplying Decimals  <b>Topic 7:</b> Dividing Decimals			December <b>(Note:</b> Test decimals only—no whole numbers.)
	<b>Use equivalent fractions as a strategy to add/subtract fractions.</b>				
	<b>11.</b> Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. <b>[5-NF1]</b> <b>Note:</b> In general, $a/b + c/d = (ad + bc)/bd$ . <ul style="list-style-type: none"> <li>➤ equivalent fractions</li> <li>➤ simplified form</li> <li>➤ improper fractions</li> <li>➤ mixed numbers</li> </ul>	<b>Topic 11:</b> Multiplying and Dividing Fractions and Mixed Numbers  <b>Topic 9:</b> Adding and Subtracting Fractions  <b>Topic 10:</b> Adding and Subtracting Mixed Numbers			December <b>(Note:</b> Test multiplying and dividing fractions and mixed numbers.  March <b>(Note:</b> Test adding and subtracting fractions and mixed numbers.)

**Monroe County Schools**  
**Math Pacing Guide – Grade 5**

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<b>2<sup>nd</sup> Nine Weeks</b>	<b>12.</b> Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally, and assess the reasonableness of answers. <b>[5-NF2]</b>	<b>Topic 9:</b> Adding and Subtracting Fractions  <b>Topic 10:</b> Adding and Subtracting Mixed Numbers			March
	<b>Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</b>				
	<b>13.</b> Interpret a fraction as division of the numerator by the denominator ( $\frac{a}{b} = a \div b$ ). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. <b>[5-NF3]</b>				December

**Monroe County Schools**  
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<div>2<sup>nd</sup> Nine Weeks</div>	<p><b>14.</b> Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. <b>[5-NF4]</b></p> <p><b>a.</b> Interpret the product <math>(\frac{a}{b}) \times q</math> as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations <math>a \times q \div b</math>. <b>[5-NF4a]</b></p> <p><b>b.</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. <b>[5-NF4b]</b></p> <ul style="list-style-type: none"> <li>➤ fraction x whole number</li> <li>➤ fraction x fraction</li> <li>➤ applied to area</li> </ul>				December

**Monroe County Schools  
Math Pacing Guide – Grade 5**

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2 <sup>nd</sup> Nine Weeks	<p><b>15.</b> Interpret multiplication as scaling (resizing), by: <b>[5-NF5]</b></p> <p><b>a.</b> 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. <b>[5-NF5a]</b></p> <p><b>b.</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 <math>\frac{a}{b} = \frac{(n \times a)}{(n \times b)}</math> to the effect of multiplying a b by 1. <b>[5-NF5b]</b></p>				December
	<p><b>16.</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. <b>[5-NF6]</b></p>				December

**Monroe County Schools**  
**Math Pacing Guide – Grade 5**

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2 <sup>nd</sup> Nine Weeks	<p><b>17.</b> Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (Students able to multiply fractions in general can develop strategies to divide fractions in general by reasoning about the relationship between multiplication and division. However, division of a fraction by a fraction is not a requirement at this grade.) <b>[5-NF7]</b></p> <p><b>a.</b> Interpret division of a unit fraction by a nonzero whole number, and compute such quotients. <b>[5-NF7a]</b></p> <p><b>b.</b> Interpret division of a whole number by a unit fraction, and compute such quotients. <b>[5-NF7b]</b></p> <p><b>c.</b> Solve real-world problems involving division of unit fractions by nonzero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. <b>[5-NF7c]</b></p> <p><b>Note:</b> Division of a fraction by a fraction is <u>not</u> a requirement at grade 5.</p> <ul style="list-style-type: none"> <li>➤ whole numbers/unit fractions or unit fractions/whole numbers</li> </ul>				December
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3 <sup>rd</sup> Nine Weeks	<b>Represent and Interpret Data.</b>				
	19. Make a line plot to display a data set of measurements in fractions of a unit ( $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$ ). Use operations on fractions for this grade to solve problems involving information presented in line plots. <b>[5-MD2]</b>	<b>Topic 14:</b> Data			March
	<b>Write and interpret numerical expressions.</b>				
	1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. <b>[5-OA1]</b>  2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <b>[5-OA2]</b>	<b>Topic 8:</b> Numerical Expressions, Patterns, and Relationships	Investigations Units 1, 2, 6, and 8		March  March
	<b>Analyze patterns and relationships.</b>				
	3. 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. <b>[5-OA3]</b> ➤ graphing patterns				March

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3 <sup>rd</sup> Nine Weeks	Graph points on the coordinate plane to solve real-world and mathematical problems.				
	<p><b>23.</b> 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). <b>[5-G1]</b></p> <p><b>24.</b> 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. <b>[5-G2]</b></p>	<p><b>Topic 16:</b> Coordinate Geometry</p> <p><b>Topic 15:</b> Classifying Plane Figures</p>			<p>March</p> <p>March</p>

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3 <sup>rd</sup> Nine Weeks	Use equivalent fractions as a strategy to add/subtract fractions. (Review from 2 <sup>nd</sup> Nine Weeks)				
	<p><b>11.</b> Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. <b>[5-NF1]</b></p> <p><b>Note:</b> In general, <math>a/b + c/d = (ad + bc)/bd</math>.</p> <ul style="list-style-type: none"> <li>➤ equivalent fractions</li> <li>➤ simplified form</li> <li>➤ improper fractions</li> <li>➤ mixed numbers</li> </ul> <p><b>12.</b> Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally, and assess the reasonableness of answers. <b>[5-NF2]</b></p>	<p><b>Topic 11:</b> Multiplying and Dividing Fractions and Mixed Numbers</p> <p><b>Topic 9:</b> Adding and Subtracting Fractions</p> <p><b>Topic 10:</b> Adding and Subtracting Mixed Numbers</p> <p><b>Topic 9:</b> Adding and Subtracting Fractions</p> <p><b>Topic 10:</b> Adding and Subtracting Mixed Numbers</p>			<p>March (<b>Note:</b> Test adding and subtracting fractions and mixed numbers.)</p> <p>March</p>
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**Monroe County Schools**  
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<b>4<sup>th</sup> Nine Weeks</b>	<b>Classify two-dimensional figures into categories based on their properties.</b>				
	<b>25.</b> Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. <b>[5-G3]</b>	<b>Topic 15:</b> Classifying Plane Figures			May
	<b>26.</b> Classify two-dimensional figures in a hierarchy based on properties. <b>[5-G4]</b>	<b>Topic 15:</b> Classifying Plane Figures			May
	<p><b>22a.</b> Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. <b>[5-MD5a]</b></p> <p><b>22c.</b> Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real-world problems. <b>[5-MD5c]</b></p>				May
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**Monroe County Schools**  
**Math Pacing Guide – Grade 5**

Assessment Guide							
October (end of 1 <sup>st</sup> Nine Weeks)		December (end of 2 <sup>nd</sup> Nine Weeks)		March (end of 3 <sup>rd</sup> Nine Weeks)		May (end of 4 <sup>th</sup> Nine Weeks)	
AL COS	Common Core	AL COS	Common Core	AL COS	Common Core	AL COS	Common Core
4	[5-NBT1]	10	[5-NB7]—Test decimals only—no whole numbers	11	[5-NF1]—Test adding and subtracting fractions and mixed numbers only.	25	[5-G3]
18	[5-MD1]—Test metric conversion only.	11	[5-NF1]—Test only multiplying and dividing fractions and mixed numbers.	12	[5-NF2]	26	[5-G4]
5	[5-NBT2]	13	[5-NF3]	19	[5-MD2]	22a	[5-MD5a]
6	[5-NBT3]	14	[5-NF4]	1	[5-OA1]	22c	[5-MD5c]
6a	[5-NBT3a]	14a	[5-NF4a]	2	[5-OA2]		
6b	[5-NBT3b]	14b	[5-NF4b]	3	[5-OA3]		
7	[5-NBT4]	15	[5-NF5]	23	[5-G1]		
10	[5-NBT7]— Test whole numbers only.	15a	[5-NF5a]	24	[5-G2]		
8	[5-NBT5]	15b	[5-NF5b]	18	[5-MD1]—Test customary only.		
22	[5-MD5]	16	[5-NF6]	20	[5-MD3]		
22b	[5-MD5b]—Test only L x W x H.	17	[5-NF7]	20a	[5-MD3a]		
9	[5-NBT6]	17a	[5-NF7a]	20b	[5-MD3b]		
		17b	[5-NF7b]	21	[5-MD4]		
		17c	[5-NF7c]				