

**Mathematics Pacing Guide Alignment with Common Core Standards  
Third Grade**

**Unit 1: Place Value**

Common Core	Assessments	Vocabulary	Resources
<p><b>Use place value understanding and properties of operations to perform multi-digit arithmetic.</b>            3. NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.             3. NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. (A range of algorithms may be used.)</p>	<p><b>Before</b>            Observation             Pretest   <b>During</b>            Slate response- adding and subtracting numbers             Mad Minutes   <b>After</b>            Test – rounding numbers</p>	<p>Base ten blocks            Odd            Even            Ordinal numbers            Place value (ones, tens, hundreds, thousands)            Regrouping (with addition &amp; trading)            Rounding            Subtraction            Sum            Difference</p>	<p>Base ten blocks</p>

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**Unit 2: Addition and Subtraction**

<b>Common Core</b>	<b>Assessments</b>	<b>Vocabulary</b>	<b>Resources</b>
<p><b>Solve problems involving the four operations, and identify and explain patterns in arithmetic.</b></p> <p>3. OA.8 Solve two-step word problems using the four operations. 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.</p>	<p><b>Before</b></p> <p>Daily word problem</p> <p>Observation</p>	<p>Addition</p> <p>Equation</p> <p>Mathematical sentences</p> <p>Subtraction</p> <p>(including both comparison and take away model)</p>	<p>Word problems</p> <p>Manipulatives</p>
	<p><b>During</b></p> <p>Daily word problem</p> <p>Think-pair-share</p>		
	<p><b>After</b></p> <p>Slate response- solving word problems</p>	<p>Variable</p> <p>Sum</p> <p>Difference</p> <p>Missing</p> <p>Addends</p>	

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**Unit 3: Measurement**

Common Core	Assessments	Vocabulary	Resources
<p><b>Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.</b></p> <p>3. MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.</p> <p>3. MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l)<sup>1</sup>. Add, subtract, multiply or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem<sup>2</sup>.</p>	<p><b>Before</b> Practical experience/ Observation time/volume and masses</p> <p><b>During</b> Verbal response – reciting time using a clock</p> <p>Slate response – write the time using a clock</p> <p><b>After</b> Quiz- Telling time and measuring volumes and masses</p>	<p>Addition Equation Mathematical sentences Subtraction (including both comparison and take away model)</p> <p>Variable Sum Difference Gram (g) Kilogram (kg) Liter (l) Mass Multiplication</p>	<p>Teacher clock</p> <p>Individual student clocks</p> <p>Different size jars/containers</p> <p>Math Games: <a href="http://www.mathisfun.com">www.mathisfun.com</a></p>

<sup>1</sup> Excludes compound units such as cm<sup>3</sup> and finding the geometric volume of a container.

<sup>2</sup> Excludes multiplicative comparison problems (problems involving notions of “times as much.”)

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**Unit 4: Graphing**

Common Core	Assessments	Vocabulary	Resources
<p><b>Represent and interpret data</b> 3. MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.</p>	<p><b>Before</b> Classroom graph</p> <p><b>During</b> Slate response- draw pictograph and bar graph</p> <p>Response cards</p> <p><b>After</b> Test- draw/respond to pictograph and bar graphs</p>	<p>Bar graph Chart Data Graph</p>	<p>Interactive Bar Graph: <a href="http://www.amblesideprimary.com/ambleweb/mentalmaths/graphr.html">http://www.amblesideprimary.com/ambleweb/mentalmaths/graphr.html</a></p>

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**Unit 5: Arithmetic Patterns**

Common Core	Assessments	Vocabulary	Resources
<p><b>CRITICAL AREA:</b>  <b>Developing understanding of multiplication and division and strategies for multiplication and division within 100</b></p> <p><b>Solve problems involving the four operations, and identify and explain patterns in arithmetic.</b></p> <p>3. OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.</p>	<p><b>Before</b>                      Bell work</p> <p><b>During</b>                      Response cards</p> <p>Verbal response-share                      number patterns</p> <p>Slate response-                      adding/subtracting.                      Number patterns</p> <p><b>After</b>                      Mini quiz – arithmetic                      patterns</p>	<p>Patterns</p> <p>Multiples</p> <p>Missing</p> <p>Addends</p> <p>Sum</p> <p>Product</p> <p>Table</p>	<p>Number line</p> <p>Hundreds chart</p>

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**Unit 6: Understanding Multiplication and Division**

Common Core	Assessments	Vocabulary	Resources
<p><b>CRITICAL AREA:</b>  <b>Developing understanding of multiplication and division and strategies for multiplication and division within 100</b></p> <p><b>Represent and solve problems involving multiplication and division</b></p> <p>3. OA.1 Interpret products of whole numbers, e.g., interpret <math>5 \times 7</math> as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as <math>5 \times 7</math>.</p> <p>3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret <math>56 \div 8</math> as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as <math>56 \div 8</math>.</p> <p>3. OA.3 Use multiplication and division within 100 to solve word problems in situations involving</p>	<p><b>Before</b></p> <p>Timed Tests- multiplication and division problems</p> <p>Pretest</p> <p><b>During</b></p> <p>Slate Response – quick check on multiplication division facts</p> <p>Multiplication Bingo</p> <p>Timed Tests multiplication and division problems</p> <p>Around the world</p> <p><b>After</b></p> <p>Fact families game</p> <p>Multiplication Bingo</p> <p>Around the world</p> <p>Timed Tests multiplication and division problems</p> <p>Mini quiz –</p>	<p>Sum</p> <p>Product</p> <p>Partial product</p> <p>Factor</p> <p>Groups</p> <p>Equal groups</p> <p>Equation</p> <p>Whole</p> <p>Part of a whole</p> <p>Multiply</p> <p>Divide</p> <p>Unknown</p> <p>Fact families</p>	<p>Counters</p> <p>Math Worksheets:  <a href="http://www.superteacherworksheets.com">www.superteacherworksheets.com</a></p>

<p>equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3. OA.4 Determine the unknown whole number in a multiplication/division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations <math>8 \times ? = 48</math>, <math>5 = \_ \div 3</math>, <math>6 \times 6 = ?</math></p>	<p>multiplication/ division facts</p>		
<p><b>Understand properties of multiplication and the relationship between multiplication and division.</b></p> <p>3. OA.5 Apply properties<sup>3</sup> of operations as strategies to multiply and divide. Examples: If <math>6 \times 4 = 24</math> is known, then <math>4 \times 6 = 24</math> is also known. (Commutative property of multiplication.) <math>3 \times 5 = 15</math> then <math>15 \div 3 = 5</math> or <math>15 \div 5 = 3</math>. (Associative property of multiplication.) Knowing that <math>8 \times 5 = 40</math> and <math>8 \times 2 = 16</math>, one can find <math>8 \times 7</math> as <math>8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56</math>. (Distributive property.)</p> <p>3. OA.6 Understand division as ar</p>	<p><b>Before</b></p> <p>Timed Tests multiplication and division problems</p> <p>Pretest</p> <p><b>During</b></p> <p>Slate Response– quick check on multiplication division facts</p> <p>Multiplication Bingo</p> <p>Timed Tests multiplication and division problems</p> <p>Around the world</p>	<p>Sum Product Partial product Factor Groups Equal groups Equation Whole Part of a whole Multiply Divide Commutative Distributive</p>	<p>Flash cards</p> <p>Multiplication games</p> <p>Counters</p> <p>Math Games: <a href="http://www.arcademicskillbuilders.com">www.arcademicskillbuilders.com</a></p>

<sup>3</sup> Students need not use formal terms for these properties.

<p>unknown-factor problem. For example, divide <math>32 \div 8</math> by finding the number that makes 32 when multiplied by 8.</p> <p>3. OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that <math>8 \times 5 = 40</math>, one knows <math>40 \div 5 = 8</math>) or properties of operations. By the end of Grade 3 know from memory all products of one-digit numbers.</p>	<p><b>After</b></p> <p>Fact families</p> <p>Game</p> <p>Around the world</p> <p>Timed Tests</p> <p>multiplication and division problems</p> <p>Mini quiz – multiplication/division facts</p>		
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**Unit 7: Solving Problems with Multiplication and Division**

Common Core	Assessments	Vocabulary	Resources
<p><b>CRITICAL AREA:</b>  <b>Developing understanding of multiplication and division and strategies for multiplication and division within 100</b></p> <p><b>Solve problems involving the four operations, and identify and explain patterns in arithmetic.</b></p> <p>3. OA.8 Solve two-step word problems using the four operations. 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<sup>4</sup>.</p>	<p><b>Before</b>  Daily word problem</p> <p><b>During</b>  Think-pair-share</p> <p>Slate response quick check on multiplication and division facts</p> <p><b>After</b>  Unit test- multiplication and division facts</p>	<p>Sum  Product  Partial product  Factor  Groups  Equal groups  Equation  Whole  Part of a whole  Multiply  Divide</p>	<p>Daily word problems</p> <p>Manipulatives</p>
<p><b>Use place value understanding and properties of operations to perform multi-digit arithmetic.</b></p> <p>3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., <math>9 \times 80</math>, <math>5 \times 60</math>) using strategies based on place value and properties of operations.</p>	<p><b>Before</b>  Timed test  multiplication and division problems</p> <p>Observation</p> <p><b>During</b>  Slate response – word</p>	<p>Sum  Product  Partial product  Factor  Groups  Equal groups  Equation  Whole  Part of a whole</p>	<p>Timed tests</p> <p>Slate boards</p> <p>Flash cards</p>

<sup>4</sup> This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations)

<sup>5</sup> A range of algorithms may be used

	<p>problems</p> <p>Timed Test multiplication and division problems</p> <p><b><u>After</u></b> Timed Test multiplication and division problems</p>	<p>Multiply Divide</p>	
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**Unit 8: Geometry**

Common Core	Assessments	Vocabulary	Resources
<p><b>CRITICAL AREA:</b> <b>Developing understanding of the structure of rectangular arrays and of area</b></p> <p><b>Geometric measurement: understand concepts of area and relate area to multiplication and to addition</b></p> <p>3. MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.</p> <p>a. A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.</p> <p>b. A plane figure which can be covered without gaps or overlaps by <math>n</math> unit squares is said to have an area of <math>n</math> square units.</p> <p>3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).</p> <p>3. MD.7 Relate area to the operations of multiplication and addition.</p> <p>a. Find the area of a rectangle</p>	<p><b>Before</b></p> <p>Observation</p> <p>Pretest</p> <p><b>During</b></p> <p>Count the tiles in the classroom</p> <p>Create tiled area of a specific side</p> <p>Slate board response – relate area to multiplication and to addition</p> <p><b>After</b></p> <p>Quiz – relate area to multiplication and to addition</p>	<p>Array</p> <p>Square units</p> <p>Area</p> <p>Rectangle</p> <p>Length</p> <p>Width</p> <p>One square unit</p> <p>Multiplication</p> <p>Addition</p> <p>Additive</p> <p>Side</p> <p>Polygon</p> <p>Square</p>	<p>Geoboards</p> <p>Graph paper</p> <p>Tiling pieces</p>

<p>with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.</p> <p>b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.</p> <p>d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.</p>			
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**Unit 9: Geometry**

Common Core	Assessments	Vocabulary	Resources
<p><b>CRITICAL AREA:</b> <b>Developing understanding of the structure of rectangular arrays and of area</b></p> <p><b>Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.</b></p> <p>3. MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different area or with the same area and different perimeter.</p>	<p><b>Before</b> Observation</p> <p>Pretest – perimeter and area</p> <p><b>During</b> Measuring objects around the classroom</p> <p>Record lengths of sides and total length on chart</p> <p><b>After</b> Quiz –perimeter and area</p>	<p>Square units Area Rectangle Length Width One square unit Multiplication Addition Additive Side Polygon Square Perimeter Same Different</p>	<p>Ruler</p> <p>Objects to measure around the classroom</p> <p>Meter stick</p>
<p><b>Content moving into 3<sup>rd</sup> grade</b> <b>Geometric measurement: understand concepts of area and relate area to multiplication and to addition</b></p> <p>3. MD.7 Relate area to the operations of multiplication and addition.</p> <p>c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths <math>a</math> and <math>b + c</math> is the sum of <math>a \times b</math> and <math>a \times c</math>.</p>	<p><b>Before</b> Observation</p> <p><b>During</b> Create tiled area of a specific side and relate to multiplication</p> <p>Count the tiles in the classroom</p> <p><b>After</b> Quiz finding area</p>	<p>Array Square units Area Rectangle Length Width One square unit Multiplication Addition Additive Side Polygon Square</p>	<p>Geoboards</p> <p>Graph paper</p> <p>Tiling pieces</p>

<p><math>b</math> and <math>a \times c</math>. Use area models to represent the distributive property in mathematical reasoning.</p>		<p>Perimeter Same Different</p>	
<p><b>CRITICAL AREA:</b> <b>Describing and analyzing two-dimensional shapes</b></p> <p><b>Reason with shapes and their attributes</b></p> <p>3. G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.</p>	<p><b>Before</b> Sort shapes based on attributes</p> <p>Observation</p> <p><b>During</b> Slate response-identifying 2-D shapes</p> <p>Create shapes using straws and twist ties</p> <p><b>After</b> Mini quiz – two dimensional shapes</p>	<p>Square Rectangle Rhombus Triangle Sides Quadrilaterals Category</p>	<p>Sentence strips</p> <p>Variety of 2-D shapes</p> <p>Flash cards</p> <p>Straws and twist ties</p>

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**Unit 10: Fractions**

Common Core	Assessments	Vocabulary	Resources
<p><b>CRITICAL AREA:</b> <b>Developing understanding of fractions, especially unit fractions (fractions with numerator 1)<sup>6</sup></b></p> <p><b>Develop understanding of fractions as numbers</b></p> <p>3. NF.1 Understand a fraction <math>1/b</math> as the quantity formed by 1 part when a whole is partitioned into <math>b</math> equal parts; understand a fraction <math>a/b</math> as the quantity formed by <math>a</math> parts of size <math>1/b</math>.</p> <p>3. NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.</p> <p>a. Represent a fraction <math>1/b</math> on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into <math>b</math> equal parts. Recognize that each part has size <math>1/b</math> and that the endpoint of the part based at 0 locates the number <math>1/b</math> on the number line.</p> <p>b. Represent a fraction <math>a/b</math> on a</p>	<p><b>Before</b></p> <p>Slate board response to dictation</p> <p>Pretest</p> <p><b>During</b></p> <p>Fraction bingo</p> <p>Shading shapes</p> <p>Circling fractions of objects</p> <p><b>After</b></p> <p>Test - Fractions</p> <p>Fraction bingo</p>	<p>Fraction</p> <p>Numerator</p> <p>Denominator</p> <p>Part</p> <p>Whole</p> <p>Equivalence</p> <p>Number line</p> <p>Equal parts</p>	<p>Sentence strips</p> <p>Chart paper</p> <p>Fraction chart</p> <p>Graph paper</p> <p>Math Lessons: <a href="http://www.aaastudy.com">www.aaastudy.com</a></p> <p>Math Games: <a href="http://www.gamequarium.com">www.gamequarium.com</a> <a href="http://www.mathisfun.com">www.mathisfun.com</a> <a href="http://www.funbrain.com">www.funbrain.com</a></p> <p>Games and Worksheets: <a href="http://www.aplusmath.com">www.aplusmath.com</a></p>

<sup>6</sup> Grade 3 expectations are limited to fractions with denominators 2, 3, 4, 6, and 8.

<p>number line diagram by marking off a lengths <math>1/b</math> from 0. Recognize that the resulting interval has size <math>a/b</math> and that its endpoint locates the number <math>a/b</math> on the number line.</p>			
<p>3. NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.</p> <ul style="list-style-type: none"> <li>a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.</li> <li>b. Recognize and generate simple equivalent fractions (e.g., <math>1/2 = 2/4</math>, <math>4/6 = 2/3</math>), Explain why the fractions are equivalent, e.g., by using a visual fraction model.</li> <li>c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples Express 3 in the form <math>3 = 3/1</math>; recognize that <math>6/1 = 6</math>; locate <math>4/4</math> and 1 at the same point of a number line diagram.</li> <li>d. Compare two fractions with the same numerator or the same denominator, by reasoning about their size, Recognize that valid comparisons rely on the two fractions referring to the same whole. Record the</li> </ul>			



<p>results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions, e.g., by using a visual fraction model.</p> <p><b>Represent and interpret data</b></p> <p>3. MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.</p> <p><b>Reason with shapes and their attributes</b></p> <p>3. G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition shape into 4 parts with equal area and describe the area of each part is <math>\frac{1}{4}</math> of the area of the shape.</p>			
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