

HOWELL TOWNSHIP  
PUBLIC SCHOOLS

**MATHEMATICS CURRICULUM  
FRAMEWORK**

**GRADE 3**

**BOARD APPROVED: August 23, 2017**

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3<sup>rd</sup> Grade Math Curriculum Map 2017-2018

Pacing	September	October	November	December	January	February	March	April	May	June
	<p><b>Topic 1:</b> Understanding Multiplication and Division of Whole Numbers</p> <p><b>Topic 2:</b> Multiplication Facts: Use Patterns</p>	<p><b>Topic 3:</b> Apply Properties: Multiplication Facts for 3-4, 6-8</p> <p><b>Topic 4:</b> Use Multiplication to Divide: Division Facts</p>	<p><b>Topic 5:</b> Fluently Multiply and Divide Within 100</p>	<p><b>Topic 6:</b> Connect Area to Multiplication and Division</p>	<p><b>Topic 11:</b> Use Operations with Whole Numbers to Solve Problems</p> <p><b>Topic 12:</b> Understand Fractions as Numbers</p>	<p><b>Topic 13:</b> Fraction Equivalence and Comparison</p> <p><b>Topic 14:</b> Solve Time, Capacity, and Mass Problems</p>	<p><b>Topic 7:</b> Represent and Interpret Data</p> <p><b>Topic 15:</b> Attributes of Two-Dimensional Shapes</p>	<p><b>Topic 8:</b> Use Strategies and Properties to Add and Subtract</p> <p><b>Topic 9:</b> Fluently Add and Subtract Within 1,000</p> <p><b>Topic 10:</b> Multiply by Multiples of 10</p>	<p><b>Topic 16:</b> Solve Perimeter Problems</p>	Step Up to Grade 4
NJSLS Domain	Operations and Algebraic Thinking	Operations and Algebraic Thinking	Operations and Algebraic Thinking	Measurement and Data	Operations and Algebraic Thinking  Number and Operations-Fractions	Number and Operations-Fractions  Measurement and Data	Measurement and Data  Geometry	Number and Operations in Base Ten	Measurement and Data	
District Assessments	End of Year Assessment  STAR Math  Pre-test Fluency Assessment (3.OA.7)	Fluency Assessment	Fluency Assessment	Fluency Assessment	Fluency Assessment  STAR Math	Fluency Assessment	Fluency Assessment	Fluency Assessment  PARCC Math April 30-May 3	End of Year Assessment	

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Mathematical Practices	<p><b>Use Appropriate Tools</b> MP.5 <i>(Also, MP.1, MP.2, MP.3, MP.4, MP.7)</i></p> <p><b>Model with Math</b> MP.4 <i>(Also, MP.1, MP.2, MP.3, MP.5)</i></p>	<p><b>Repeated Reasoning</b> MP.8 <i>(Also, MP.1, MP.3, MP.5, MP.7)</i></p> <p><b>Make sense and persevere</b> MP.1 <i>(Also, MP.2, MP.3, MP.6, MP.8)</i></p>	<p><b>Look for and use structure</b> MP.7 <i>(Also, MP.1, MP.3, MP.4)</i></p>	<p><b>Look for and use structure</b> MP.7 <i>(Also, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6)</i></p>	<p><b>Critique Reasoning</b> MP.3 <i>(Also, MP.1, MP.2, MP.5, MP.6)</i></p> <p><b>Make sense and persevere</b> MP.1 <i>(Also, MP.2, MP.3, MP.6)</i></p>	<p><b>Construct Arguments</b> MP.3 <i>(Also, MP.1, MP.4, MP.5, MP.6)</i></p> <p><b>Reasoning</b> MP.2 <i>(Also, MP.1, MP.3, MP.4, MP.6, MP.8)</i></p>	<p><b>Precision</b> MP.6 <i>(Also, MP.1, MP.2, MP.4, MP.7)</i></p> <p><b>Precision</b> MP.6 <i>(Also, MP.1, MP.3, MP.5, MP.7)</i></p>	<p><b>Model with Math</b> MP.4 <i>(Also, MP.1, MP.2, MP.3, MP.5)</i></p> <p><b>Construct Arguments</b> MP.3 <i>(Also, MP.1, MP.2, MP.4, MP.7)</i></p> <p><b>Look for and use structure</b> MP.7 <i>(Also, MP.1, MP.3, MP.4), MP.8)</i></p>	<p><b>Reasoning</b> MP.2, <i>(Also, MP.1, MP.3, MP.6, MP.7)</i></p>	
NJSLS – Technology	8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including	8.2.5.C.4 Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with	8.2.5.C.4 Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with	8.2.5.D.3 Follow step by step directions to assemble a product or solve a problem	8.2.5.C.4 Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with	8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including	8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including	8.2.5.C.4 Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results	8.2.5.C.4 Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results	

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	solving problems.	supporting sketches or models	supporting sketches or models		supporting sketches or models	solving problems.	solving problems.	with supporting sketches or models	with supporting sketches or models	
NJSLS - Career Ready Practices	CRP4,CRP6, CRP8, CRP10, CRP11,	CRP4,CRP6, CRP8, CRP10, CRP11,	CRP4,CRP6, CRP8, CRP10, CRP11,							

Unit 1		
Unit Summary	NJSLS Standards	Essential Questions
<p>Unit 1: In this unit, students will represent and solve problems involving multiplication and division. Students will interpret the meaning of multiplication and division, and using patterns to begin to build fluency with multiplication facts (Topics 1-2)</p> <p>Students will focus on using known facts and properties of multiplication to learn the multiplication facts with factors of 3, 4, 6, 7, and 8, and using the relationship</p>	<p><b>3.OA.A.1</b> 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 and/or represent a context in which a total number of objects can be expressed as <math>5 \times 7</math>.</p> <p><b>3.OA.A.2</b> 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 and/or represent a context in which a number of shares or a number of groups can be expressed as <math>56 \div 8</math>.</p> <p><b>3.OA.A.3</b> Use multiplication and division within 100 to solve word problems in situations involving 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>What are the different meanings of multiplication and division?</p> <p>How can unknown multiplication facts be found using patterns and properties?</p> <p>How can unknown multiplication facts be found using known facts?</p> <p>How can unknown division facts be found using known multiplication facts?</p> <p>How can strategies be used to solve multiplication and division facts?</p>

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<p>between multiplication and division to learn division facts. Students will understand properties of multiplication and the relationship between multiplication and division (Topics 3 &amp; 4)</p> <p>Students will focus on applying strategies to achieve fluency with multiplication and division facts within 100. Students will be able to multiply and divide within 100 by the end of grade 3 (Topics 5)</p>	<p><b>3.OA.B.5</b> Apply properties 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 \times 2</math> can be found by <math>3 \times 5 = 15</math>, then <math>15 \times 2 = 30</math>, or by <math>5 \times 2 = 10</math>, then <math>3 \times 10 = 30</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><b>3.OA.B.6</b> Understand division as an unknown-factor problem. For example, find <math>32 \div 8</math> by finding the number that makes 32 when multiplied by 8.</p> <p><b>3.OA.C.7</b> 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 two one-digit numbers.</p> <p><b>3.OA.D.9</b> 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>	
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Learning Goals:

- Student will be able to understand different meanings of multiplication and division.
- Students will be able to find unknown multiplication facts by using patterns and properties.
- Students will be able to find unknown multiplication facts using known facts.
- Student will be able find unknown division facts using known multiplication facts.
- Students will be able to identify strategies to solve multiplication and division facts.

Vocabulary: equal groups, multiplication, factors, product, equation, unknown, number line, array, row, column, commutative property of multiplication, division, multiples, identity property of multiplication, zero property of multiplication, dividend, divisor, fact family, quotient, even, odd,

Fluency Expectations: To be able to add and subtract fluently on basic-fact timed tests.

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Unit 1 Student Goals: To receive 80% or better on the Basic-Facts 2 minute Timed Tests (use Basic Fact Timed Test 1-6 in Assessment book)		
Unit 3		
Unit Summary	NJSL Standards	Essential Questions
<p>Unit 2: (Topics 6)</p> <p>In this unit, students will understand concepts of area and relate area to multiplication and addition. Students will develop a deep understanding of the concept of area. Students will begin with concrete models and then move towards pictorial and abstract models (Topic 6)</p>	<p><b>3.MD.C.5a</b> Recognize area as an attribute of plane figures and understand concepts of area measurement.</p> <p style="padding-left: 20px;">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>3.MD.C.5b</b> Recognize area as an attribute of plane figures and understand concepts of area measurement.</p> <p style="padding-left: 20px;">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.<sup>2</sup></p> <p><b>3.MD.C.6</b> Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard units).</p> <p><b>3.MD.C.7a</b> Relate area to the operations of multiplication and addition.</p> <p style="padding-left: 20px;">a. Find the area of a rectangle 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>3.MD.C.7b</b> Relate area to the operations of multiplication and addition.</p> <p style="padding-left: 20px;">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><b>3.MD.C.7c</b> Relate area to the operations of multiplication and addition.</p> <p style="padding-left: 20px;">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>. Use area models to represent the Distributive property in mathematical reasoning.</p> <p><b>3.MD.C.7d</b> Relate area to the operations of multiplication and addition.</p> <p style="padding-left: 20px;">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>	<p>What strategies can be used to measure area?</p>

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	<i>2 Students need not use formal terms for these properties.</i>	
Learning Goal: Students will be able to measure and find area.		
Vocabulary: area, unit square, square unit, estimate,		
Fluency Expectations: To be able to multiply fluently on basic-fact timed tests.		
Unit 2 Student Goals: To receive 80% or better on the Basic-Facts 2 minute Timed Tests (use Basic Fact Timed Test 7-9 in Assessment book)		
<b>Unit 3</b>		
Enduring Understanding	NJSL Standards	Essential Questions
Unit 3:  In this unit, students will use operations with whole numbers to solve problems. Students will learn how to solve two-step word problems involving whole numbers. (Topic 11)	<b>3.OA.D.8</b> Solve problems involving the four operations, and identify and explain patterns in Arithmetic <sup>3</sup> . 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.  <i>3. 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).</i>	What strategies can be used to solve two-step problems?
Learning Goal: Students will understand how to solve two-step problems.		
Vocabulary: none		
Fluency Expectations: To be able to multiply fluently on basic-fact timed tests.		
Unit 3 Student Goals: To receive 80% or better on the Basic-Facts 2 minute Timed Tests (use Basic Fact Timed Test 7-9 in Assessment book)		
<b>Unit 4</b>		
Enduring Understanding	NJSL Standards	Essential Questions

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<p>Unit 4:</p> <p>In this unit, students will develop an understanding of fractions as numbers. Students will learn that fractions are numbers that can represent a portion of a whole or a point on the number line. Students will use models and number sense to understand fraction equivalence and comparison (Topics 12 and 13)</p>	<p><b>3.NF.A.1</b> Develop understanding of fractions as numbers.</p> <ol style="list-style-type: none"><li>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>.</li></ol> <p><b>3.G.A.2</b> Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as <math>1/4</math> of the area of the shape.</p> <p><b>3.NF.A.3</b> Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.</p> <ol 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 comparisons are valid only when the two fractions refer to the same whole. Record the 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.</li></ol> <p><b>3.NF.A.2a</b> Understand a fraction as a number on the number line; represent fractions on a number line diagram.</p> <ol style="list-style-type: none"><li>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.</li></ol> <p><b>3.NF.A.2b</b> Understand a fraction as a number on the number line; represent fractions on a number line diagram.</p> <ol style="list-style-type: none"><li>b. Represent a fraction <math>a/b</math> on a number line diagram by marking off <math>a</math> lengths <math>1/b</math> from 0. Recognize that the resulting interval has size</li></ol>	<p>What are different interpretations of a fraction?</p>
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	<p>a/b and that its endpoint locates the number a/b on the number line.</p> <p><b>3.MD.B.4</b> 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>Learning Goals:</p> <ul style="list-style-type: none"> <li>• Students will understand different interpretations of a fraction.</li> <li>• Student will compare fractions in different ways.</li> </ul>		
<p>Vocabulary: fraction, unit fraction, numerator, denominator, nearest fourth inch, line plot, nearest half inch</p>		
<p>Fluency Expectations: To be able to multiply fluently on basic-fact timed tests.</p>		
<p>Unit 4 Student Goals: To receive 80% or better on the Basic-Facts 2 minute Timed Tests (use Basic Fact Timed Test 7-9 in Assessment book)</p>		
<b>Unit 5</b>		
Enduring Understanding	NJSLS Standards	Essential Questions
<p>Unit 5:</p> <p>In this unit, students will learn to tell time to the nearest minute on an analog clock. Students will solve problems involving elapsed time. Students will learn about the relationship between hours and minutes as well as the difference between A.M. and P.M. Students will learn that liquid volume is the amount of liquid a container can hold and that</p>	<p><b>3.MD.A.1</b> Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.</p> <p>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><b>3.MD.A.2</b> Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.</p> <p>2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).<sup>6</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>7</sup></p>	<p>How can time, capacity, and mass be measured and found?</p> <p>How can data be represented, interpreted, and analyzed?</p>

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<p>mass is a measure of the amount of matter in an object. (Topic 14)</p> <p>Students will learn to read and make scaled picture graphs and scaled bar graphs that represent a data set with several categories. Students will solve problems involving the data represented in the graphs. (Topic 7)</p> <p>Students will identify attributes of two-dimensional shapes, especially quadrilaterals. Students will learn that shapes in different categories may share attributes that place them in a larger category. (Topic 15)</p>	<p><sup>6</sup> Excludes compound units such as cm<sup>3</sup> and finding the geometric volume of a container.</p> <p><sup>7</sup> Excludes multiplicative comparison problems (problems involving notions of “times as much”; see Glossary, Table 2).</p> <p><b>3.MD.B.3</b> Represent and interpret data.</p> <p>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>3.OA.A.3</b> Use multiplication and division within 100 to solve word problems in situations involving 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><b>3.OA.D.8</b> Solve problems involving the four operations, and identify and explain patterns in arithmetic.</p> <p>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>3</sup></p> <p><b>3.G.A.1</b> Reason with shapes and their attributes.</p> <p>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><sup>3</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)</p>	<p>How can two-dimensional shapes be described, analyzed, and classified?</p>
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Learning Goals:



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<p>standard algorithm for adding 3-digit numbers deepens students understanding of regrouping and place value. (Topic 9)</p> <p>Students learn how to use number lines to show multiplication. Students' will combine their knowledge of place value, operations, and properties with multiplying by multiples of 10. (Topic 10)</p>		
<p>Learning Goals:</p> <ul style="list-style-type: none"> <li>● Students will mentally find sums and differences through estimation.</li> <li>● Students will understand standard procedures for adding and subtracting whole numbers.</li> <li>● Students will understand ways to multiply by multiples of 10.</li> </ul>		
<p>Vocabulary: associative property of addition, commutative property of addition, identity property of addition, round, place value, compatible numbers, inverse operations, regroup, conjecture, open number line</p>		
<p>Fluency Expectations: To be able to division fluently on basic-fact timed tests.</p>		
<p>Unit 6 Student Goals: To receive 80% or better on the Basic-Facts 2 minute Timed Tests (use Basic Fact Timed Test 10-11 in Assessment book)</p>		
<b>Unit 7</b>		
Enduring Understanding	NJSL Standards	Essential Questions
<p>Unit 7:</p> <p>In this unit, students will recognize perimeter as an attribute of polygons, finding perimeter using addition and multiplication, and finding an</p>	<p><b>3.MD.D.8</b> Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.</p> <p>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 areas or with the same area and different perimeters.</p>	<p>How can perimeter be measured and found?</p>

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unknown side length. Students will distinguish the attribute of perimeter from the attribute of area by analyzing rectangles with the same perimeter and different areas or with the same area and different perimeters. (Topic 16)	<b>3.MD.C.7b</b> Relate area to the operations of multiplication and addition. 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.	
Learning Goal: Students can find and measure perimeter.		
Vocabulary: perimeter, equilateral triangle		
Fluency Expectations: To be able to division fluently on basic-fact timed tests.		
Unit 7: Student Goals: To receive 80% or better on the Basic-Facts 2 minute Timed Tests (use Basic Fact Timed Test 10-11 in Assessment book)		
Preparing for 4 <sup>th</sup> Grade Standards		