

TOUCHMATH[®]



ALIGNMENT TO NORTH CAROLINA STANDARD COURSE OF STUDY K-8 MATHEMATICS



UPPER GRADES

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Alignment to North Carolina Standard Course of Study K-8 Mathematics
 Referencing Activity Sheets and Teacher’s Guide Unit Overviews in the TouchMath® Upper Grades Standards-Based Program

NC Standard Course of Study K-8 Mathematics, Grade K	TouchMath® Upper Grades Standards-Based Program
NC.K.CC Counting and Cardinality	
Know number names and the counting sequence.	
1. Know number names and recognize patterns in the counting sequence by: <ul style="list-style-type: none"> Counting to 100 by ones. Counting to 100 by tens. 	Unit 1, Module 1: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 Unit 1 Teacher’s Guide: Module 1
2. Count forward beginning from a given number within the known sequence, instead of having to begin at 1.	Unit 1, Module 1: 15, 16, 17, 18, 19, 20 Unit 1 Teacher’s Guide: Module 1, Module 3, Module 7
3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20, with 0 representing a count of no objects.	Unit 1, Module 1: 21, 22, 23, 24, 25, 26 Unit 1 Teacher’s Guide: Module 1, Module 3
Count to tell the number of objects.	
4. Understand the relationship between numbers and quantities. <ul style="list-style-type: none"> When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object (one-to-one correspondence). Recognize that the last number named tells the number of objects counted regardless of their arrangement (cardinality). State the number of objects in a group, of up to 5 objects, without counting the objects (perceptual subitizing). 	Unit 1, Module 1: 27 Unit 1 Teacher’s Guide: Module 1, Module 3

<p>5. Count to answer “How many?” in the following situations:</p> <ul style="list-style-type: none"> Given a number from 1–20, count out that many objects. Given up to 20 objects, name the next successive number when an object is added, recognizing the quantity is one more/greater. Given 20 objects arranged in a line, a rectangular array, and a circle, identify how many. Given 10 objects in a scattered arrangement, identify how many. 	<p>Unit 1 Teacher’s Guide: Module 1, Module 3</p>
<p>Compare numbers.</p>	
<p>6. Identify whether the number of objects, within 10, in one group is greater than, less than, or equal to the number of objects in another group, by using matching and counting strategies.</p>	<p>Unit 1 Teacher’s Guide: Module 1, Module 3, Module 6, Module 7</p>
<p>7. Compare two numbers, within 10, presented as written numerals.</p>	<p>Unit 1 Teacher’s Guide: Module 1, Module 3, Module 6</p>
<p>NC.K.OA Operations and Algebraic Thinking</p>	
<p>Understand addition and subtraction.</p>	
<p>1. Represent addition and subtraction, within 10:</p> <ul style="list-style-type: none"> Use a variety of representations such as objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, or expressions. Demonstrate understanding of addition and subtraction by making connections among representations. 	<p>Unit 1, Module 2: 28 Unit 1 Teacher’s Guide: Module 2, Module 4, Module 5</p>
<p>2. Solve addition and subtraction word problems, within 10, a using objects or drawings to represent the problem, when solving:</p> <ul style="list-style-type: none"> Add to/Take From-Result Unknown Put Together/Take Apart (Total Unknown and Two Addends Unknown) 	<p>Unit 1, Module 2: 29, 30, 31, 32, 33, 34, 35, 36 Unit 1 Teacher’s Guide: Module 2, Module 4, Module 5, Module 7</p>
<p>3. Decompose numbers less than or equal to 10 into pairs in more than one way using objects or drawings, and record each decomposition by a drawing or equation.</p>	<p>Unit 1, Module 2: 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60 Unit 1 Teacher’s Guide: Module 7</p>

4. For any number from 0 to 10, find the number that makes 10 when added to the given number using objects or drawings, and record the answer with a drawing or expression.	Unit 1 Teacher's Guide: Module 7
5. Demonstrate fluency with addition and subtraction within 5.	Unit 1 Teacher's Guide: Module 2, Module 4, Module 5, Module 7
6. Recognize and combine groups with totals up to 5 (conceptual subitizing).	Unit 1 Teacher's Guide: Module 2, Module 4, Module 5, Module 7
NC.K.NBT Number and Operations in Base Ten	
Build foundations for place value.	
1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones by: <ul style="list-style-type: none"> Using objects or drawings. Recording each composition or decomposition by a drawing or expression. Understanding that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. 	Unit 1, Module 4: 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112 Unit 1 Teacher's Guide: Module 1, Module 7 Unit 3, Module 3: 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86 Unit 3, Module 4: 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112 Unit 3, Module 6: 141, 142, 148, 157, 159, 164, 165, 168, 169

NC Standard Course of Study K-8 Mathematics, Grade 1	TouchMath® Upper Grades Standards-Based Program
NC.1.OA Operations and Algebraic Thinking	
Represent and solve problems.	
<p>1. Represent and solve addition and subtraction word problems, within 20, with unknowns, by using objects, drawings, and equations with a symbol for the unknown number to represent the problem, when solving:</p> <ul style="list-style-type: none"> • Add to/Take from-Change Unknown • Put together/Take Apart-Addend Unknown • Compare-Difference Unknown 	<p>Unit 1, Module 2: 61 Unit 1 Teacher's Guide: Module 2, Module 4, Module 5, Module 6, Module 7, Module 8 Unit 1, Module 5: 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141 Unit 2 Teacher's Guide: Module 2, Module 4, Module 5, Module 6</p>
<p>2. Represent and solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, by using objects, drawings, and equations with a symbol for the unknown number.</p>	<p>Unit 1 Teacher's Guide: Module 2, Module 7, Module 8 Unit 2 Teacher's Guide: Module 2, Module 4, Module 5, Module 6</p>
Understand and apply the properties of operations.	
<p>3. Apply the commutative and associative properties as strategies for solving addition problems.</p>	<p>Unit 1 Teacher's Guide: Module 2, Module 4, Module 5, Module 7, Module 8 Unit 2 Teacher's Guide: Module 2, Module 4, Module 5, Module 6</p>
<p>4. Solve an unknown-addend problem, within 20, by using addition strategies and/or changing it to a subtraction problem.</p>	<p>Unit 1, Module 3: 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77 Unit 1 Teacher's Guide: Module 4, Module 5, Module 7, Module 8 Unit 2 Teacher's Guide: Module 2, Module 4, Module 5, Module 6</p>
Add and subtract within 20.	
<p>6. Add and subtract, within 20, using strategies such as:</p> <ul style="list-style-type: none"> • Counting on • Making ten • Decomposing a number leading to a ten • Using the relationship between addition and subtraction • Using an number line • Creating equivalent but simpler or known sums. 	<p>Unit 1, Module 4: 113, 114, 115, 116, 117, 118, 119, 120, 121 Unit 1 Teacher's Guide: Module 2, Module 4, Module 5, Module 6, Module 7, Module 8 Unit 2 Teacher's Guide: Module 2, Module 4, Module 5, Module 6</p>
<p>9. Demonstrate fluency with addition and subtraction within 10.</p>	<p>Unit 1, Module 4: 79, 80, 113, 114, 115, 116, 117, 118, 119, 120, 121 Unit 1 Teacher's Guide: Module 2, Module 4, Module 5, Module 7, Module 8 Unit 2 Teacher's Guide: Module 2, Module 4, Module 5, Module 6 Unit 3 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8 Unit 4 Teacher's Guide: Module 1</p>

Analyze addition and subtraction equations within 20.	
7. Apply understanding of the equal sign to determine if equations involving addition and subtraction are true.	Unit 1 Teacher's Guide: Module 2, Module 4, Module 5, Module 7, Module 8 Unit 2 Teacher's Guide: Module 2, Module 4, Module 5, Module 6 Unit 3 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8
8. Determine the unknown whole number in an addition or subtraction equation involving three whole numbers.	Unit 1 Teacher's Guide: Module 4, Module 5, Module 7, Module 8 Unit 2 Teacher's Guide: Module 2, Module 4, Module 5, Module 6
NC.1.NBT Number and Operations in Base Ten	
Extend and recognize patterns in the counting sequence.	
1. Count to 150, starting at any number less than 150.	Unit 1 Teacher's Guide: Module 1, Module 6 Unit 2 Teacher's Guide: Module 1
Understand place value.	
2. Understand that the two digits of a two-digit number represent amounts of tens and ones. <ul style="list-style-type: none"> • Unitize by making a ten from a collection of ten ones. • Model the numbers from 11 to 19 as composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. • Demonstrate that the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens, with 0 ones. 	Unit 1 Teacher's Guide: Module 6 Unit 2 Teacher's Guide: Module 3, Module 4 Unit 3 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8 Unit 4 Teacher's Guide: Module 1, Module 2
3. Compare two two-digit numbers based on the value of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.	Unit 1, Module 7: 177, 178, 179 180 Unit 1, Module 8: 197, 198 Unit 1 Teacher's Guide: Module 6, Module 7 Unit 2, Module 1: 1 Unit 2 Teacher's Guide: Module 1, Module 2, Module 4, Module 5, Module 6 Unit 3 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8 Unit 4 Teacher's Guide: Module 1, Module 2, Module 3, Module 6
Use place value understanding and properties of operations.	
4. Using concrete models or drawings, strategies based on place value, properties of operations, and explaining the reasoning used, add, within 100, in the following situations: <ul style="list-style-type: none"> • A two-digit number and a one-digit number • A two-digit number and a multiple of 10 	Unit 1, Module 6: 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153 Unit 1, Module 8: 182, 195, 196 Unit 1 Teacher's Guide: Module 7, Module 8 Unit 2 Teacher's Guide: Module 4, Module 5, Module 6

5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	Unit 1, Module 6: 154, 155, 156, 157, 158, 159, 160, 161, 162 Unit 2 Teacher's Guide: Module 5, Module 6 Unit 3 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8
6. Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90, explaining the reasoning, using: <ul style="list-style-type: none"> • Concrete models and drawings • Number lines • Strategies based on place value • Properties of operations • The relationship between addition and subtraction 	Unit 2 Teacher's Guide: Module 5, Module 6
NC.1.MD Measurement and Data	
Represent and interpret data.	
4. Organize, represent, and interpret data with up to three categories. <ul style="list-style-type: none"> • Ask and answer questions about the total number of data points. • Ask/answer questions about how many in each category. • Ask and answer questions about how many more or less are in one category than in another. 	Unit 3 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8
NC.1.G Geometry	
Reason with shapes and their attributes.	
2. Create composite shapes by: <ul style="list-style-type: none"> • Making a two-dimension composite shape using rectangles, squares, trapezoids, triangles, and half-circles naming the components of the new shape. • Making a three-dimensional composite shape using cubes, rectangular prisms, cones, and cylinders, naming the components of the new shape. 	Unit 9, Module 1: 1
3. Partition circles and rectangles into two and four equal shares. <ul style="list-style-type: none"> • Describe the shares as halves and fourths, as half of and fourth of. • Describe the whole as two of, or four of the shares. • Explain that decomposing into more equal shares creates smaller shares. 	Unit 3, Module 2: 25, 26, 27

NC.2.OA Operations and Algebraic Thinking

Represent and solve problems.

1. Represent and solve addition and subtraction word problems, within 100, with unknowns in all positions, by using representations and equations with a symbol for the unknown number to represent the problem, when solving:
- One-Step problems:
 - Add to/Take from-Start Unknown
 - Compare-Bigger Unknown
 - Compare-Smaller Unknown
 - Two-Step problems involving single digits:
 - Add to/Take from- Change Unknown
 - Add to/Take from- Result Unknown

Unit 1, Module 7: 168, 169, 170, 171, 172, 173, 174, 175, 176, 181
Unit 1, Module 8: 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 199, 200
Unit 1 Teacher’s Guide: Module 7, Module 8
Unit 2, Module 1: 18, 19, 20, 21, 22, 23, 24, 25
Unit 2, Module 2: 62, 63, 64
Unit 2 Teacher’s Guide: Module 2, Module 4, Module 5, Module 6

Add and subtract within 20.

2. Demonstrate fluency with addition and subtraction, within 20, using mental strategies.

Unit 2, Module 2: 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61
Unit 2 Teacher’s Guide: Module 2, Module 4, Module 5, Module 6

Work with equal groups.

3. Determine whether a group of objects, within 20, has an odd or even number of members by:
- Pairing objects, then counting them by 2s.
 - Determining whether objects can be placed into two equal groups.
 - Writing an equation to express an even number as a sum of two equal addends.

Unit 3 Teacher’s Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8
Unit 4 Teacher’s Guide: Module 1

4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Unit 3 Teacher’s Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8
Unit 4 Teacher’s Guide: Module 2
Unit 5, Module 1: 9

NC.2.NBT Number and Operations in Base Ten

Understand place value.

<p>1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones.</p> <ul style="list-style-type: none"> • Unitize by making a hundred from a collection of ten tens. • Demonstrate that the numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds, with 0 tens and 0 ones. • Compose and decompose numbers using various groupings of hundreds, tens, and ones. 	<p>Unit 2, Module 4: 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140 Unit 2 Teacher’s Guide: Module 3, Module 4</p>
<p>2. Count within 1000; skip-count by 5s, 10s, and 100s.</p>	<p>Unit 2, Module 3: 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86 Unit 2 Teacher’s Guide: Module 1 Unit 3, Module 1: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 Unit 3, Module 2: 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 40, 41, 42, 43, 44, 45, 46 Unit 3, Module 4: 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 93 Unit 3, Module 5: 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114 Unit 3, Module 6: 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133 Unit 3, Module 7: 156, 157, 168, 159, 160, 161 Unit 3, Module 8: 169, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200 Unit 3 Teacher’s Guide: Module 4 Unit 4 Teacher’s Guide: Module 1, Module 2, Module 3, Module 6</p>
<p>3. Read and write numbers, within 1,000, using base-ten numerals, number names, and expanded form.</p>	<p>Unit 2, Module 1: 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37 Unit 2, Module 3: 87, 88 Unit 2 Teacher’s Guide: Module 1</p>
<p>4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.</p>	<p>Unit 2, Module 5: 141, 142, 143, 144, 145, 146, 147 Unit 2, Module 6: 173, 174, 175, 176, 177, 178, 179, 180 Unit 2 Teacher’s Guide: Module 4, Module 5, Module 6 Unit 5 Teacher’s Guide: Module 1</p>

Use place value understanding and properties of operations.	
<p>5. Demonstrate fluency with addition and subtraction, within 100, by:</p> <ul style="list-style-type: none"> Flexibly using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Comparing addition and subtraction strategies, and explaining why they work. Selecting an appropriate strategy in order to efficiently compute sums and differences. 	<p>Unit 1 Teacher’s Guide: Module 6, Module 7, Module 8 Unit 2, Module 1: 2, 3, 4 Unit 2 Teacher’s Guide: Module 4, Module 5, Module 6 Unit 3, Module 3: 47, 48, 49, 50 Unit 3, Module 5: 94, 95 Unit 3, Module 6: 134, 135, 136, 137 Unit 3, Module 7: 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151 Unit 3, Module 8: 170, 171, 172, 173, 174 Unit 6 Teacher’s Guide: Module 1, Module 2, Module 3</p>
<p>6. Add up to four two-digit numbers using strategies based on place value and properties of operations.</p>	<p>Unit 1, Module 5: 126, 127 Unit 2 Teacher’s Guide: Module 4, Module 5, Module 6 Unit 6 Teacher’s Guide: Module 2, Module 3</p>
<p>7. Add and subtract, within 1,000, relating the strategy to a written method, using:</p> <ul style="list-style-type: none"> Concrete models or drawings Strategies based on place value Properties of operations Relationship between addition and subtraction 	<p>Unit 1, Module 3: 78 Unit 1, Module 4: 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125 Unit 2, Module 6: 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200 Unit 2 Teacher’s Guide: Module 5, Module 6 Unit 3, Module 3: 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69 Unit 6 Teacher’s Guide: Module 1, Module 2, Module 3, Module 4</p>
<p>8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.</p>	<p>Unit 6 Teacher’s Guide: Module 2, Module 3, Module 5</p>
NC.2.MD Measurement and Data	
Measure and estimate lengths.	
<p>3. Estimate lengths using units of inches, feet, yards, centimeters, and meters.</p>	<p>Unit 9, Module 1: 3</p>
Represent and interpret data.	
<p>10. Organize, represent, and interpret data with up to four categories.</p> <ul style="list-style-type: none"> Draw a picture graph and a bar graph with a single-unit scale to represent a data set. Solve simple put-together, take-apart, and compare problems using information presented in a picture and a bar graph. 	<p>Unit 3, Module 2: 38, 39 Unit 3 Teacher’s Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8</p>

NC.2.G Geometry

Reason with shapes and their attributes.

3. Partition circles and rectangles into two, three, or four equal shares.
- Describe the shares using the words halves, thirds, half of, a third of, fourths, fourth of, quarter of.
 - Describe the whole as two halves, three thirds, four fourths.
 - Explain that equal shares of identical wholes need not have the same shape.

Unit 7 Teacher's Guide: Module 1

NC Standard Course of Study K-8 Mathematics, Grade 3	TouchMath® Upper Grades Standards-Based Program
NC.3.OA Operations and Algebraic Thinking	
Represent and solve problems involving multiplication and division.	
<p>1. For products of whole numbers with two factors up to and including 10:</p> <ul style="list-style-type: none"> Interpret the factors as representing the number of equal groups and the number of objects in each group. Illustrate and explain strategies including arrays, repeated addition, decomposing a factor, and applying the commutative and associative properties. 	<p>Unit 4, Module 1: 1, 3 Unit 4, Module 2: 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 61, 62, 63, 64, 65, 67, 68, 69, 70, 71, 76 Unit 4, Module 5: 152, 153, 154 Unit 4, Module 6: 173, 174, 175, 176, 177, 183, 184, 185, 186, 187, 188, 189, 190, 193, 194, 199, 200 Unit 4 Teacher’s Guide: Module 6 Unit 5, Module 1: 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28 Unit 5, Module 2: 42, 43, 44, 45, 46, 47 Unit 5 Teacher’s Guide: Module 1 Unit 6 Teacher’s Guide: Module 1, Module 2</p>
<p>2. For whole-number quotients of whole numbers with a one-digit divisor and a one-digit quotient:</p> <ul style="list-style-type: none"> Interpret the divisor and quotient in a division equation as representing the number of equal groups and the number of objects in each group. Illustrate and explain strategies including arrays, repeated addition or subtraction, and decomposing a factor. 	<p>Unit 4, Module 6: 159, 160, 161, 180, 181, 182, 183 Unit 4 Teacher’s Guide: Module 6 Unit 5, Module 2: 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 48, 49, 50, 51 Unit 5 Teacher’s Guide: Module 2 Unit 6 Teacher’s Guide: Module 1, Module 2</p>
<p>3. Represent, interpret, and solve one-step problems involving multiplication and division.</p> <ul style="list-style-type: none"> Solve multiplication word problems with factors up to and including 10. Represent the problem using arrays, pictures, and/or equations with a symbol for the unknown number to represent the problem. Solve division word problems with a divisor and quotient up to and including 10. Represent the problem using arrays, pictures, repeated subtraction and/or equations with a symbol for the unknown number to represent the problem. 	<p>Unit 4 Teacher’s Guide: Module 1, Module 2, Module 3, Module 4, Module 6 Unit 5 Teacher’s Guide: Module 1, Module 2 Unit 6 Teacher’s Guide: Module 1, Module 2, Module 3</p>
Understand properties of multiplication and the relationship between multiplication and division.	
<p>6. Solve an unknown-factor problem, by using division strategies and/or changing it to a multiplication problem.</p>	<p>Unit 4 Teacher’s Guide: Module 3, Module 4, Module 6 Unit 5 Teacher’s Guide: Module 2, Module 4, Module 7 Unit 6, Module 1: 2 Unit 6 Teacher’s Guide: Module 1, Module 2, Module 3, Module 4, Module 6</p>

Multiply and divide within 100.	
<p>7. Demonstrate fluency with multiplication and division with factors, quotients and divisors up to and including 10.</p> <ul style="list-style-type: none"> Know from memory all products with factors up to and including 10. Illustrate and explain using the relationship between multiplication and division. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. 	<p>Unit 4, Module 3: 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127 Unit 4, Module 6: 171, 172, 195, 196, 197, 198 Unit 4 Teacher's Guide: Module 2, Module 3, Module 4, Module 5, Module 6 Unit 5 Teacher's Guide: Module 1, Module 2, Module 7 Unit 6 Teacher's Guide: Module 1, Module 2, Module 3</p>
Solve two-step problems.	
<p>8. Solve two-step word problems using addition, subtraction, and multiplication, representing problems using equations with a symbol for the unknown number.</p>	<p>Unit 4 Teacher's Guide: Module 3, Module 6 Unit 5 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7 Unit 6 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6</p>
Explore patterns of numbers.	
<p>9. Interpret patterns of multiplication on a hundreds board and/or multiplication table.</p>	<p>Unit 3 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8 Unit 4, Module 1: 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 Unit 4, Module 2: 25, 26, 60, 66, 72, 73, 74, 75 Unit 4 Teacher's Guide: Module 1, Module 3, Module 4, Module 5, Module 6 Unit 5 Teacher's Guide: Module 7 Unit 6 Teacher's Guide: Module 1, Module 2, Module 3 Unit 9, Module 5: 115, 116, 117, 118, 119, 120</p>
NC.3.NBT Number and Operations in Base Ten	
Use place value to add and subtract.	
<p>2. Add and subtract whole numbers up to and including 1,000.</p> <ul style="list-style-type: none"> Use estimation strategies to assess reasonableness of answers. Model and explain how the relationship between addition and subtraction can be applied to solve addition and subtraction problems. Use expanded form to decompose numbers and then find sums and differences. 	<p>Unit 6 Teacher's Guide: Module 2, Module 3, Module 4, Module 5, Module 6 Unit 7, Module 1: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 48, 49, 50 Unit 7, Module 2: 64, 65, 66, 67, 69, 72</p>
Generalize place value understanding for multi-digit numbers.	
<p>3. Use concrete and pictorial models, based on place value and the properties of operations, to find the product of a one-digit whole number by a multiple of 10 in the range 10–90.</p>	<p>Unit 5 Teacher's Guide: Module 1, Module 3, Module 4</p>

NC.3.NF Number and Operations – Fractions

Understand fractions as numbers.

<p>1. Interpret unit fractions with denominators of 2, 3, 4, 6, and 8 as quantities formed when a whole is partitioned into equal parts;</p> <ul style="list-style-type: none">• Explain that a unit fraction is one of those parts.• Represent and identify unit fractions using area and length models.	<p>Unit 7, Module 1: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 48, 49, 50 Unit 7, Module 2: 64, 65, 66, 67, 69, 72 Unit 7 Teacher’s Guide: Module 1, Module 2, Module 5</p>
<p>2. Interpret fractions with denominators of 2, 3, 4, 6, and 8 using area and length models.</p> <ul style="list-style-type: none">• Using an area model, explain that the numerator of a fraction represents the number of equal parts of the unit fraction.• Using a number line, explain that the numerator of a fraction represents the number of lengths of the unit fraction from 0.	<p>Unit 7, Module 1: 26, 27, 44, 45 Unit 7, Module 2: 63, 68, 70, 71 Unit 7 Teacher’s Guide: Module 1, Module 2, Module 5</p>
<p>3. Represent equivalent fractions with area and length models by:</p> <ul style="list-style-type: none">• Composing and decomposing fractions into equivalent fractions using related fractions: halves, fourths and eighths; thirds and sixths.• Explaining that a fraction with the same numerator and denominator equals one whole• Expressing whole numbers as fraction, and recognize fractions that are equivalent to whole numbers.	<p>Unit 7, Module 2: 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62 Unit 7 Teacher’s Guide: Module 1, Module 2, Module 3, Module 4, Module 5</p>
<p>4. Compare two fractions with the same numerator or the same denominator by reasoning about their size, using area and length models, and using the $>$, $<$, and $=$ symbols. Recognize that comparisons are valid only when the two fractions refer to the same whole with denominators: halves, fourths and eighths; thirds and sixths.</p>	<p>Unit 7 Teacher’s Guide: Module 1, Module 2, Module 3, Module 4, Module 5</p>

NC.3.MD Measurement and Data**Solve problems involving measurement.**

1. Tell and write time to the nearest minute. Solve word problems involving addition and subtraction of time intervals within the same hour.	Unit 9 Teacher's Guide: Module 5
2. Solve problems involving customary measurement. <ul style="list-style-type: none">• Estimate and measure lengths in customary units to the quarter-inch and half-inch, and feet and yards to the whole unit.• Estimate and measure capacity and weight in customary units to a whole number: cups, pints, quarts, gallons, ounces, and pounds.• Add, subtract, multiply, or divide to solve one-step word problems involving whole number measurements of length, weight, and capacity in the same customary units.	Unit 9, Module 1: 2

Represent and interpret data.

3. Represent and interpret scaled picture and bar graphs: <ul style="list-style-type: none">• Collect data by asking a question that yields data in up to four categories.• Make a representation of data and interpret data in a frequency table, scaled picture graph, and/or scaled bar graph with axes provided.• Solve one and two-step “how many more” and “how many less” problems using information from these graphs	Unit 3 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6, Module 7, Module 8 Unit 9 Teacher's Guide: Module 5, Module 7
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Understand the concept of area.

5. Find the area of a rectangle with whole-number side lengths by tiling without gaps or overlaps and counting unit squares.	Unit 9 Teacher's Guide: Module 4
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<p>7. Relate area to the operations of multiplication and addition.</p> <ul style="list-style-type: none"> 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. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving problems, and represent whole-number products as rectangular areas in mathematical reasoning. Use tiles and/or arrays to illustrate and explain that the area of a rectangle can be found by partitioning it into two smaller rectangles, and that the area of the large rectangle is the sum of the two smaller rectangles. 	<p>Unit 9 Teacher's Guide: Module 4</p>
<p>Understand the concept of perimeter.</p>	
<p>8. Solve problems involving perimeters of polygons, including finding the perimeter given the side lengths, and finding an unknown side length.</p>	<p>Unit 9 Teacher's Guide: Module 4</p>
<p>NC.3.G Geometry</p>	
<p>Reason with shapes and their attributes.</p>	
<p>1. Reason with two-dimensional shapes and their attributes.</p> <ul style="list-style-type: none"> Investigate, describe, and reason about composing triangles and quadrilaterals and decomposing quadrilaterals. Recognize and draw examples and non-examples of types of quadrilaterals including rhombuses, rectangles, squares, parallelograms, and trapezoids. 	<p>Unit 9, Module 1: 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 Unit 9 Teacher's Guide: Module 3</p>

NC Standard Course of Study K-8 Mathematics, Grade 4	TouchMath® Upper Grades Standards-Based Program
NC.4.OA Operations and Algebraic Thinking	
Represent and solve problems involving multiplication and division.	
<p>1. Interpret a multiplication equation as a comparison. Multiply or divide to solve word problems involving multiplicative comparisons using models and equations with a symbol for the unknown number. Distinguish multiplicative comparison from additive comparison.</p>	<p>Unit 4 Teacher’s Guide: Module 2, Module 4, Module 6 Unit 5, Module 3: 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77 Unit 5, Module 5: 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140 Unit 6, Module 1: 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 Unit 6, Module 2: 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61 Unit 6 Teacher’s Guide: Module 1, Module 2, Module 6 Unit 9, Module 5: 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134 Unit 9, Module 8: 193, 194, 195</p>
Use the four operations with whole numbers to solve problems.	
<p>3. Solve two-step word problems involving the four operations with whole numbers.</p> <ul style="list-style-type: none"> • Use estimation strategies to assess reasonableness of answers. • Interpret remainders in word problems. • Represent problems using equations with a letter standing for the unknown quantity. 	<p>Unit 6 Teacher’s Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 6</p>
Gain familiarity with factors and multiples.	
<p>4. Find all factor pairs for whole numbers up to and including 50 to:</p> <ul style="list-style-type: none"> • Recognize that a whole number is a multiple of each of its factors. • Determine whether a given whole number is a multiple of a given one-digit number. • Determine if the number is prime or composite. 	<p>Unit 4, Module 5: 152, 153, 154, 155, 156, 157 Unit 4 Teacher’s Guide: Module 2, Module 5 Unit 6, Module 2: 47 Unit 6 Teacher’s Guide: Module 1</p>
Generate and analyze patterns.	
<p>5. Generate and analyze a number or shape pattern that follows a given rule.</p>	<p>Unit 6 Teacher’s Guide: Module 1</p>

NC.4.NBT Number and Operations in Base Ten

Generalize place value understanding for multi-digit whole numbers.

1. Explain that in a multi-digit whole number, a digit in one place represents 10 times as much as it represents in the place to its right, up to 100,000.	Unit 5, Module 4: 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 Unit 5, Module 7: 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182 Unit 5 Teacher's Guide: Module 2, Module 3, Module 4, Module 5, Module 6, Module 7 Unit 6 Teacher's Guide: Module 2, Module 3, Module 4, Module 5, Module 6
2. Read and write multi-digit whole numbers up to and including 100,000 using numerals, number names, and expanded form.	Unit 5 Teacher's Guide: Module 1, Module 2, Module 3, Module 4, Module 5, Module 7 Unit 6 Teacher's Guide: Module 3, Module 4, Module 5, Module 6
7. Compare two multi-digit numbers up to and including 100,000 based on the values of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.	Unit 5 Teacher's Guide: Module 3, Module 4, Module 5, Module 6, Module 7 Unit 6 Teacher's Guide: Module 2, Module 3, Module 4, Module 5, Module 6

Use place value understanding and properties of operations to perform multi-digit arithmetic.

4. Add and subtract multi-digit whole numbers up to and including 100,000 using the standard algorithm with place value understanding.	Unit 6 Teacher's Guide: Module 2, Module 3, Module 4, Module 5, Module 6
5. Multiply a whole number of up to three digits by a one-digit whole number, and multiply up to two two-digit numbers with place value understanding using area models, partial products, and the properties of operations. Use models to make connections and develop the algorithm.	Unit 5 Teacher's Guide: Module 1, Module 3, Module 5, Module 7 Unit 6 Teacher's Guide: Module 2, Module 3, Module 4, Module 5, Module 6 Unit 7 Teacher's Guide: Module 6
6. Find whole-number quotients and remainders with up to three-digit dividends and one-digit divisors with place value understanding using rectangular arrays, area models, repeated subtraction, partial quotients, properties of operations, and/or the relationship between multiplication and division.	Unit 5, Module 4: 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123 Unit 5, Module 6: 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170 Unit 5 Teacher's Guide: Module 2, Module 4, Module 6, Module 7 Unit 6 Teacher's Guide: Module 2, Module 3, Module 4, Module 5, Module 6 Unit 7 Teacher's Guide: Module 6, Module 7 Unit 8 Teacher's Guide: Module 5

NC.4.NF Number and Operations – Fractions

Extend understanding of fractions.

1. Explain why a fraction is equivalent to another fraction by using area and length fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size.	Unit 7, Module 2: 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96 Unit 7 Teacher's Guide: Module 1, Module 2, Module 3, Module 5
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<p>2. Compare two fractions with different numerators and different denominators, using the denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. 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 by:</p> <ul style="list-style-type: none"> Reasoning about their size and using area and length models. Using benchmark fractions 0, $\frac{1}{2}$, and a whole. Comparing common numerator or common denominators. 	<p>Unit 7, Module 3: 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116 Unit 7 Teacher's Guide: Module 2, Module 3, Module 5 Unit 8 Teacher's Guide: Module 1, Module 2, Module 7, Module 8</p>
<p>Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.</p>	
<p>3. Understand and justify decompositions of fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, and 100.</p> <ul style="list-style-type: none"> Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. Decompose a fraction into a sum of unit fractions and a sum of fractions with the same denominator in more than one way using area models, length models, and equations. Add and subtract fractions, including mixed numbers with like denominators, by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. Solve word problems involving addition and subtraction of fractions, including mixed numbers by writing equations from a visual representation of the problem. 	<p>Unit 7, Module 4: 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132 Unit 7, Module 5: 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145 Unit 7 Teacher's Guide: Module 2, Module 3, Module 4, Module 5 Unit 8 Teacher's Guide: Module 1, Module 7, Module 8</p>
<p>Use unit fractions to understand operations of fractions.</p>	
<p>4. Apply and extend previous understandings of multiplication to:</p> <ul style="list-style-type: none"> Model and explain how fractions can be represented by multiplying a whole number by a unit fraction, using this understanding to multiply a whole number by any fraction less than one. Solve word problems involving multiplication of a fraction by a whole number. 	<p>Unit 8 Teacher's Guide: Module 2, Module 7, Module 8</p>

Understand decimal notation for fractions, and compare decimal fractions.	
6. Use decimal notation to represent fractions. <ul style="list-style-type: none"> Express, model and explain the equivalence between fractions with denominators of 10 and 100. Use equivalent fractions to add two fractions with denominators of 10 or 100. Represent tenths and hundredths with models, making connections between fractions and decimals. 	Unit 7, Module 6: 161, 162, 163, 164 Unit 7 Teacher's Guide: Module 8 Unit 8 Teacher's Guide: Module 7, Module 8
7. Compare two decimals to hundredths by reasoning about their size using area and length models, and recording the results of comparisons with the symbols $>$, $=$, or $<$. Recognize that comparisons are valid only when the two decimals refer to the same whole.	Unit 7, Module 8: 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194
NC.4.MD Measurement and Data	
Solve problems involving measurement.	
1. Know relative sizes of measurement units. Solve problems involving metric measurement. <ul style="list-style-type: none"> Measure to solve problems involving metric units: centimeter, meter, gram, kilogram, Liter, milliliter. Add, subtract, multiply, and divide to solve one-step word problems involving whole-number measurements of length, mass, and capacity that are given in metric units. 	Unit 9 Teacher's Guide: Module 6
2. Use multiplicative reasoning to convert metric measurements from a larger unit to a smaller unit using place value understanding, two-column tables, and length models.	Unit 8 Teacher's Guide: Module 7, Module 8 Unit 9, Module 6: 135 Unit 9, Module 8: 195, 196, 197, 198, 199, 200 Unit 9 Teacher's Guide: Module 5
8. Solve word problems involving addition and subtraction of time intervals that cross the hour.	Unit 9, Module 5: 119, 120, 121
Solve problems involving area and perimeter.	
3. Solve problems with area and perimeter. <ul style="list-style-type: none"> Find areas of rectilinear figures with known side lengths. Solve problems involving a fixed area and varying perimeters and a fixed perimeter and varying areas. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. 	Unit 9 Teacher's Guide: Module 4

Represent and interpret data.	
<p>4. Represent and interpret data using whole numbers.</p> <ul style="list-style-type: none"> Collect data by asking a question that yields numerical data. Make a representation of data and interpret data in a frequency table, scaled bar graph, and/or line plot. Determine whether a survey question will yield categorical or numerical data. 	Unit 9 Teacher's Guide: Module 7
Understand concepts of angle and measure angles.	
<p>6. Develop an understanding of angles and angle measurement.</p> <ul style="list-style-type: none"> Understand angles as geometric shapes that are formed wherever two rays share a common endpoint, and are measured in degrees. Measure and sketch angles in whole-number degrees using a protractor. Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems. 	Unit 9 Teacher's Guide: Module 2 Unit 10 Teacher's Guide: Module 7
NC.4.G Geometry	
Classify shapes based on lines and angles in two-dimensional figures.	
<p>1. Draw and identify points, lines, line segments, rays, angles, and perpendicular and parallel lines.</p>	Unit 9 Teacher's Guide: Module 2
<p>2. Classify quadrilaterals and triangles based on angle measure, side lengths, and the presence or absence of parallel or perpendicular lines.</p>	Unit 9, Module 3: 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67 Unit 9 Teacher's Guide: Module 3
<p>3. Recognize symmetry in a two-dimensional figure, and identify and draw lines of symmetry.</p>	Unit 9, Module 2: 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54 Unit 9, Module 3: 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80 Unit 9 Teacher's Guide: Module 3

NC Standard Course of Study K-8 Mathematics, Grade 5	TouchMath® Upper Grades Standards-Based Program
NC.5.OA Operations and Algebraic Thinking	
Write and interpret numerical expressions.	
<p>2. Write, explain, and evaluate numerical expressions involving the four operations to solve up to two-step problems. Include expressions involving:</p> <ul style="list-style-type: none"> • Parentheses, using the order of operations. • Commutative, associative and distributive properties. 	<p>Unit 4, Module 6: 167, 168, 169, 170 Unit 5 Teacher's Guide: Module 1, Module 3 Unit 6, Module 5: 141, 142, 143, 144 Unit 6, Module 6: 151, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171 Unit 6 Teacher's Guide: Module 2, Module 3, Module 6 Unit 10 Teacher's Guide: Module 4</p>
Analyze patterns and relationships.	
<p>3. Generate two numerical patterns using two given rules.</p> <ul style="list-style-type: none"> • Identify apparent relationships between corresponding terms. • Form ordered pairs consisting of corresponding terms from the two patterns. • Graph the ordered pairs on a coordinate plane. 	<p>Unit 4, Module 5: 145 Unit 10 Teacher's Guide: Module 6</p>
NC.5.NBT Number and Operations in Base Ten	
Understand the place value system.	
<p>1. Explain the patterns in the place value system from one million to the thousandths place.</p> <ul style="list-style-type: none"> • Explain 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 1/10 of what it represents in the place to its left. • Explain patterns in products and quotients when numbers are multiplied by 1,000, 100, 10, 0.1, and 0.01 and/or divided by 10 and 100. 	<p>Unit 5 Teacher's Guide: Module 1, Module 2 Unit 7 Teacher's Guide: Module 6 Unit 8 Teacher's Guide: Module 3, Module 6, Module 7</p>
<p>3. Read, write, and compare decimals to thousandths.</p> <ul style="list-style-type: none"> • Write decimals using base-ten numerals, number names, and expanded form. • Compare two decimals to thousandths based on the value of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons. 	<p>Unit 7 Teacher's Guide: Module 6, Module 7, Module 8 Unit 8 Teacher's Guide: Module 3, Module 6, Module 7, Module 8</p>

Perform operations with multi-digit whole numbers.	
5. Demonstrate fluency with the multiplication of two whole numbers up to a three-digit number by a two-digit number using the standard algorithm.	Unit 5 Teacher's Guide: Module 3, Module 5, Module 7 Unit 8, Module 3: 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86 Unit 8, Module 4: 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111 Unit 8, Module 6: 128, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147
6. Find quotients with remainders when dividing whole numbers with up to four-digit dividends and two-digit divisors using rectangular arrays, area models, repeated subtraction, partial quotients, and/or the relationship between multiplication and division. Use models to make connections and develop the algorithm.	Unit 5 Teacher's Guide: Module 3, Module 4, Module 6, Module 7 Unit 6, Module 3: 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101 Unit 6, Module 4: 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114 Unit 6, Module 5: 120, 121, 122, 123, 131, 132, 133, 134, 135, 136, 137, 138, 139, 148, 149 Unit 8, Module 7: 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158
Perform operations with decimals.	
7. Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. <ul style="list-style-type: none"> Add and subtract decimals to thousandths using models, drawings or strategies based on place value. Multiply decimals with a product to thousandths using models, drawings, or strategies based on place value. Divide a whole number by a decimal and divide a decimal by a whole number, using repeated subtraction or area models. Decimals should be limited to hundredths. Use estimation strategies to assess reasonableness of answers. 	Unit 8 Teacher's Guide: Module 3, Module 4, Module 5, Module 6, Module 7, Module 8
NC.5.NF Number and Operations – Fractions	
Use equivalent fractions as a strategy to add and subtract fractions.	
1. Add and subtract fractions, including mixed numbers, with unlike denominators using related fractions: halves, fourths, eighths; thirds, sixths, and twelfths; fifths, tenths, hundredths. <ul style="list-style-type: none"> Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. Solve one- and two-step word problems in context using area and length models to develop the algorithm. Represent the word problem in an equation. 	Unit 8, Module 1: 1, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 Unit 8, Module 2: 63 Unit 8 Teacher's Guide: Module 1, Module 6, Module 7, Module 8

Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	
<p>3. Use fractions to model and solve division problems.</p> <ul style="list-style-type: none"> • Interpret a fraction as an equal sharing context, where a quantity is divided into equal parts. • Model and interpret a fraction as the division of the numerator by the denominator. • Solve one-step word problems involving division of whole numbers leading to answers in the form of fractions and mixed numbers, with denominators of 2, 3, 4, 5, 6, 8, 10, and 12, using area, length, and set models or equations. 	Unit 8 Teacher's Guide: Module 1, Module 2, Module 6, Module 7, Module 8
<p>4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction, including mixed numbers.</p> <ul style="list-style-type: none"> • Use area and length models to multiply two fractions, with the denominators 2, 3, 4. • Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number and when multiplying a given number by a fraction less than 1 results in a product smaller than the given number. • Solve one-step word problems involving multiplication of fractions using models to develop the algorithm. 	Unit 8, Module 1: 3, 4 Unit 8, Module 2: 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62 Unit 8 Teacher's Guide: Module 2, Module 6, Module 7, Module 8
<p>7. Solve one-step word problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions using area and length models, and equations to represent the problem.</p>	Unit 8 Teacher's Guide: Module 2, Module 6, Module 7, Module 8
NC.5.MD Measurement and Data	
Convert like measurement units within a given measurement system.	
<p>1. Given a conversion chart, use multiplicative reasoning to solve one-step conversion problems within a given measurement system.</p>	Unit 9, Module 6: 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 1159 Unit 9 Teacher's Guide: Module 6

Represent and interpret data.	
2. Represent and interpret data. <ul style="list-style-type: none"> Collect data by asking a question that yields data that changes over time. Make and interpret a representation of data using a line graph. Determine whether a survey question will yield categorical or numerical data, or data that changes over time. 	Unit 9 Teacher's Guide: Module 7
Understand concepts of volume.	
4. Recognize volume as an attribute of solid figures and measure volume by counting unit cubes, using cubic centimeters, cubic inches, cubic feet, and improvised units.	Unit 9 Teacher's Guide: Module 4
5. Relate volume to the operations of multiplication and addition. <ul style="list-style-type: none"> Find the volume of a 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. Build understanding of the volume formula for rectangular prisms with whole-number edge lengths in the context of solving problems. Find volume of solid figures with one-digit dimensions composed of two non-overlapping rectangular prisms. 	Unit 10 Teacher's Guide: Module 4, Module 7
NC.5.G Geometry	
Understand the coordinate plane.	
1. Graph points in the first quadrant of a coordinate plane, and identify and interpret the x and y coordinates to solve problems.	Unit 9, Module 1: 4 Unit 9 Teacher's Guide: Module 7 Unit 10, Module 7: 168, 169, 170, 171, 172
Classify quadrilaterals.	
3. Classify quadrilaterals into categories based on their properties. <ul style="list-style-type: none"> Explain that attributes belonging to a category of quadrilaterals also belong to all subcategories of that category. Classify quadrilaterals in a hierarchy based on properties. 	Unit 9, Module 2: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 Unit 9 Teacher's Guide: Module 3

NC Standard Course of Study K-8 Mathematics, Grade 6	TouchMath® Upper Grades Standards-Based Program
NC.6.RP Ratio and Proportional Relationships	
Understand ratio concepts and use ration reasoning to solve problems.	
1. Understand the concept of a ratio and use ratio language to: <ul style="list-style-type: none"> • Describe a ratio as a multiplicative relationship between two quantities. • Model a ratio relationship using a variety of representations. 	Unit 10, Module 2: 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 Unit 10 Teacher’s Guide: Module 2
2. Understand that ratios can be expressed as equivalent unit ratios by finding and interpreting both unit ratios in context.	Unit 10, Module 2: 47, 48, 49, 50, 51, 52, 53, 54 Unit 10 Teacher’s Guide: Module 2
3. Use ratio reasoning with equivalent whole-number ratios to solve real-world and mathematical problems by: <ul style="list-style-type: none"> • Creating and using a table to compare ratios. • Finding missing values in the tables. • Using a unit ratio. • Converting and manipulating measurements using given ratios. • Plotting the pairs of values on the coordinate plane. 	Unit 7, Module 7: 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175 Unit 7 Teacher’s Guide: Module 7, Module 8 Unit 8, Module 5: 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127 Unit 8, Module 6: 129, 130, 131 Unit 8 Teacher’s Guide: Module 5, Module 6, Module 7, Module 8 Unit 10 Teacher’s Guide: Module 2
4. Use ratio reasoning to solve real-world and mathematical problems with percents by: <ul style="list-style-type: none"> • Understanding and finding a percent of a quantity as a ratio per 100. • Using equivalent ratios, such as benchmark percents (50%, 25%, 10%, 5%, 1%), to determine a part of any given quantity. • Finding the whole, given a part and the percent. 	Unit 10 Teacher’s Guide: Module 2
NC.6.NS The Number System	
Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	
1. Use visual models and common denominators to: <ul style="list-style-type: none"> • Interpret and compute quotients of fractions. • Solve real-world and mathematical problems involving division of fractions. 	Unit 8 Teacher’s Guide: Module 2, Module 6, Module 7, Module 8

Compute fluently with multi-digit numbers and find common factors and multiples.	
2. Fluently divide using long division with a minimum of a four-digit dividend and interpret the quotient and remainder in context.	Unit 6 Teacher's Guide: Module 4, Module 5, Module 6
3. Apply and extend previous understandings of decimals to develop and fluently use the standard algorithms for addition, subtraction, multiplication and division of decimals.	Unit 8 Teacher's Guide: Module 3, Module 4, Module 6, Module 7, Module 8
4. Understand and use prime factorization and the relationships between factors to: <ul style="list-style-type: none"> • Find the unique prime factorization for a whole number. • Find the greatest common factor of two whole numbers less than or equal to 100. • Use the greatest common factor and the distributive property to rewrite the sum of two whole numbers, each less than or equal to 100. • Find the least common multiple of two whole numbers less than or equal to 12 to add and subtract fractions with unlike denominators. 	Unit 6 Teacher's Guide: Module 4, Module 5, Module 6 Unit 8 Teacher's Guide: Module 1, Module 7
Apply and extend previous understandings of numbers to the system of rational numbers.	
5. Understand and use rational numbers to: <ul style="list-style-type: none"> • Describe quantities having opposite directions or values. • Represent quantities in real-world contexts, explaining the meaning of 0 in each situation. • Understand the absolute value of a rational number as its distance from 0 on the number line to: <ul style="list-style-type: none"> ○ Interpret absolute value as magnitude for a positive or negative quantity in a real-world context. ○ Distinguish comparisons of absolute value from statements about order. 	Unit 10 Teacher's Guide: Module 3

<p>6. Understand rational numbers as points on the number line and as ordered pairs on a coordinate plane.</p> <p>a. On a number line:</p> <ul style="list-style-type: none"> ○ Recognize opposite signs of numbers as indicating locations on opposite sides of 0 and that the opposite of the opposite of a number is the number itself. ○ Find and position rational numbers on a horizontal or vertical number line. <p>b. On a coordinate plane:</p> <ul style="list-style-type: none"> ○ Understand signs of numbers in ordered pairs as indicating locations in quadrants. ○ Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. ○ Find and position pairs of rational numbers on a coordinate plane. 	<p>Unit 10, Module 3: 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84</p> <p>Unit 10 Teacher's Guide: Module 3</p>
<p>7. Understand ordering of rational numbers.</p> <p>a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.</p> <p>b. Write, interpret, and explain statements of order for rational numbers in real-world contexts.</p>	<p>Unit 10 Teacher's Guide: Module 3</p>
<p>8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.</p>	<p>Unit 10 Teacher's Guide: Module 3</p>

NC.6.EE Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

1. Write and evaluate numerical expressions, with and without grouping symbols, involving whole-number exponents.	Unit 10, Module 1: 2, 3, 4, 5 Unit 10, Module 4: 85, 86, 87, 88, 89, 90 Unit 10 Teacher's Guide: Module 4
2. Write, read, and evaluate algebraic expressions. <ul style="list-style-type: none">Write expressions that record operations with numbers and with letters standing for numbers.Identify parts of an expression using mathematical terms and view one or more of those parts as a single entity.Evaluate expressions at specific values of their variables using expressions that arise from formulas used in real-world problems.	Unit 5, Module 1: 7, 8 Unit 6, Module 1: 4 Unit 10, Module 1: 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 Unit 10, Module 4: 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106 Unit 10, Module 5: 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150 Unit 10, Module 7: 193, 194, 195, 196, 197, 198, 199, 200 Unit 10 Teacher's Guide: Module 4
3. Apply the properties of operations to generate equivalent expressions without exponents.	Unit 10 Teacher's Guide: Module 4

Reason about and solve one-variable equations.

5. Use substitution to determine whether a given number in a specified set makes an equation true.	Unit 6, Module 1: 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 Unit 6, Module 4: 101, 102, 115, 116, 117, 118, 119, 124, 125, 126, 127, 128, 129 Unit 6, Module 5: 130, 140, 145, 146, 147, 150 Unit 6, Module 6: 152, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200 Unit 8, Module 7: 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172 Unit 10, Module 5: 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128 Unit 10 Teacher's Guide: Module 5
6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem.	Unit 8, Module 7: 173, 174, 175, 176, 177 Unit 8, Module 8: 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200 Unit 10, Module 4: 107, 108, 109, 111, 112, 113, 114

Reason about one variable inequalities.	
<p>8. Reason about inequalities by:</p> <ul style="list-style-type: none"> Using substitution to determine whether a given number in a specified set makes an inequality true. Writing an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognizing that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions. Representing solutions of inequalities on number line diagrams. 	Unit 6, Module 1: 5, 63, 64, 65, 66, 67
Represent and analyze quantitative relationships between dependent and independent variables.	
<p>9. Represent and analyze quantitative relationships by:</p> <ul style="list-style-type: none"> Using variables to represent two quantities in a real-world or mathematical context that change in relationship to one another. Analyze the relationship between quantities in different representations (context, equations, tables, and graphs). 	Unit 10 Teacher's Guide: Module 5
NC.6.G Geometry	
Solve real-world and mathematical problems involving area, surface area, and volume.	
<p>1. Create geometric models to solve real-world and mathematical problems to:</p> <ul style="list-style-type: none"> Find the area of triangles by composing into rectangles and decomposing into right triangles. Find the area of special quadrilaterals and polygons by decomposing into triangles or rectangles. 	Unit 9, Module 4: 108, 109, 110, 111, 112 Unit 9 Teacher's Guide: Module 4 Unit 10, Module 4: 110 Unit 10, Module 7: 183, 184, 185, 186, 187, 188, 189, 190, 191, 192
<p>2. Apply and extend previous understandings of the volume of a right rectangular prism to find the volume of right rectangular prisms with fractional edge lengths. Apply this understanding to the context of solving real-world and mathematical problems.</p>	Unit 9, Module 4: 113, 114 Unit 10 Teacher's Guide: Module 7

<p>3. Use the coordinate plane to solve real-world and mathematical problems by:</p> <ul style="list-style-type: none"> • Drawing polygons in the coordinate plane given coordinates for the vertices. • Using coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. 	<p>Unit 10 Teacher’s Guide: Module 7</p>
<p>4. Represent right prisms and right pyramids using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.</p>	<p>Unit 10 Teacher’s Guide: Module 7</p>
<p>NC.6.SP Statistics and Probability</p>	
<p>Develop understanding of statistical variability.</p>	
<p>1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.</p>	<p>Unit 9, Module 7: 160, 161, 162, 163, 164, 165 Unit 9 Teacher’s Guide: Module 8</p>
<p>2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.</p>	<p>Unit 9, Module 7: 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179 Unit 9 Teacher’s Guide: Module 8</p>
<p>3. Understand that both a measure of center and a description of variability should be considered when describing a numerical data set.</p> <p>a. Determine the measure of center of a data set and understand that it is a single number that summarizes all the values of that data set.</p> <ul style="list-style-type: none"> ○ Understand that a mean is a measure of center that represents a balance point or fair share of a data set and can be influenced by the presence of extreme values within the data set. ○ Understand the median as a measure of center that is the numerical middle of an ordered data set. <p>b. Understand that describing the variability of a data set is needed to distinguish between data sets in the same scale, by comparing graphical representations of different data sets in the same scale that have similar measures of center, but different spreads.</p>	<p>Unit 9 Teacher’s Guide: Module 8</p>

Summarize and describe distributions.	
<p>4. Display numerical data in plots on a number line.</p> <ul style="list-style-type: none"> • Use dot plots, histograms, and box plots to represent data. • Compare the attributes of different representations of the same data. 	Unit 9 Teacher's Guide: Module 8
<p>5. Summarize numerical data sets in relation to their context.</p> <p>a. Describe the collected data by:</p> <ul style="list-style-type: none"> ○ Reporting the number of observations in dot plots and histograms. ○ Communicating the nature of the attribute under investigation, how it was measured, and the units of measurement. <p>b. Analyze center and variability by:</p> <ul style="list-style-type: none"> ○ Giving quantitative measures of center, describing variability, and any overall pattern, and noting any striking deviations. ○ Justifying the appropriate choice of measures of center using the shape of the data distribution. 	Unit 9 Teacher's Guide: Module 8