Common Core State Standards for Grade 1 ↔ Primary Mathematics Standards Edition

Operations and Algebraic Thinking 1.OA	
Represent and solve problems involving addition and subtraction.	
1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	1A Unit 2: Number Bonds 1A Unit 3: Addition 1A Unit 4: Subtraction 1A Unit 6 ch 2: Addition and Subtraction See 1A workbook pp. 61-66, 110, 176 1B workbook pp. 36, 183-184, 05-208
2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	1B Unit 13 ch 4: Adding Three Numbers See Teacher's Guide 1B Lesson 13.4a
Understand and apply properties of operations and the relationship between addition and subtraction.	
3. Apply properties of operations as strategies to add and subtract.	1A Unit 2: Number Bonds 1A Unit 3 ch 2: Addition with Number Bonds 1A Unit 4 ch 2: Methods of Subtraction 1B Unit 13 ch 4: Adding Three Numbers See Teacher's Guide Lessons 3.2c-d, 13.4a
4. Understand subtraction as an unknown-addend problem.	1A Unit 2: Number Bonds 1A Unit 4 ch 2: Methods of Subtraction See Teacher's Guide Lessons 2.1e-f, 4.1c-d
Add and subtract within 20.	
5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	1A Unit 3 ch 3: Other Methods of Addition 1A Unit 4 ch 2: Methods of Subtraction
6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier or known sums.	1A unit 6 ch 2: Addition and Subtraction See Teacher's Guide 1A Lessons 2.6a-e
Work with addition and subtraction equations.	
7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.	Not explicitly covered. 1A unit 6, ch 2: Addition and Subtraction See Teacher's Guide 1A Lessons 2.6a-e
8. Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers.	1A Unit 4, ch 2: Methods of Subtraction See Teacher's Guide Lessons 4.1c-d 1A textbook p. 38 1A workbook p. 46, 56, 130
Number and Operations in Base Ten 1.NBT	
Extend the counting sequence.	
1. Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	Numbers to 100 only since base-10 is emphasized. 1B Unit 18: Numbers to 100

Understand place value.	
2. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:	
a. 10 can be thought of as a bundle of ten ones — called a "ten."	1B Unit 13 ch 2: Tens and Ones 1B Unit 18 ch 1: Tens and Ones
b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.	1A Unit 6 ch 1: Counting and Comparing
c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).	1B Unit 13 ch 2: Tens and Ones 1B Unit 18 ch 1: Tens and Ones
3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	1B Unit 18 ch 4: Comparing Numbers
Use place value understanding and properties of operations to add and subtract.	
4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	1B Unit 13 ch 3: Addition and Subtraction 1B Unit 18 ch 5: Addition within 100 1B Unit 18 ch 6: Subtraction within 100
5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	1B Unit 13 ch 2: Tens and Ones 1B Unit 18 ch 3: Order of Numbers
6. Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	1B Unit 18 ch 3: Order of Numbers 1B Unit 18 ch 6: Subtraction within 100
Measurement and Data 1.MD	
Measure lengths indirectly and by iterating length units.	
1. Order three objects by length; compare the lengths of two objects indirectly by using a third object.	1A Unit 8 ch 1: Comparing Length
2. Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*	1A Unit 8 ch 2: Measuring Length
Tell and write time.	
3. Tell and write time in hours and half-hours using analog and digital clocks.	1B Unit 17 ch 1: Telling Time

Represent and interpret data.	
4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	1B Unit 12 ch 1: Graphs (up to 4 categories)
Geometry **1.G**	
Reason with shapes and their attributes.	
1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	1A Unit 7 ch 1: Common Shapes
2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.	1A Unit 7 ch 1: Common Shapes
3. Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	1B Unit 16 ch 1: Making Halves and Fourths

Operations and Algebraic Thinking 2.OA	
Represent and solve problems involving addition and subtraction.	
1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	2A Unit 2: Addition and Subtracting 2B Unit 7 ch 1: Finding the Missing Number
Add and subtract within 20.	
2. Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.	Mastered in 1A. Review: Teacher's Guide 2A Lesson 1.1d
Work with equal groups of objects to gain foundations for multiplication.	
3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	Even numbers not specifically covered until 3A. Multiplication and Division by 2 is covered: 1A Unit 6 ch 1: Multiplication Table of 2
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.	2A Unit 5: Multiplication and Division (includes arrays of up to 40 items)
Number and Operations in Base Ten 2.NBT	
Understand place value.	
1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:	2A Unit 1 ch 2: Hundreds, Tens and Ones
a. 100 can be thought of as a bundle of ten tens — called a "hundred."	2A Unit 1 ch 2: Hundreds, Tens and Ones
b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).	2A Unit 1 ch 2: Hundreds, Tens and Ones
2. Count within 1000; skip-count by 5s, 10s, and 100s.	2A Unit 1 ch 2: Hundreds, Tens and Ones 2B Unit 8 ch 2: Multiplying and Dividing by 5 2B Unit 8 ch 3: Multiplying and Dividing by 10
3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	2A Unit 1 ch 2: Hundreds, Tens and Ones
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.	2A Unit 1 ch 3: Comparing Numbers

Use place value understanding and properties of operations to add and subtract.	
5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	2A Unit 2: Addition and Subtraction
6. Add up to four two-digit numbers using strategies based on place value and properties of operations.	2A Unit 2 ch 4: Addition with Renaming (Adding 3 numbers, includes 3-digit numbers)
7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	2A Unit 2: Addition and Subtraction
8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	2A Unit 1 ch 3: Comparing Numbers
9. Explain why addition and subtraction strategies work, using place value and the properties of operations.	2A Unit 2: Addition and Subtraction
Measurement and Data 2.MD	
Measure and estimate lengths in standard units.	
1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	2A Unit 3: Length
2. Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.	2A Unit 3 ch 1: Measuring Length
3. Estimate lengths using units of inches, feet, centimeters, and meters.	2A Unit 3: Length
4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	2A Unit 3: Length
Relate addition and subtraction to length.	
5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.	2A Unit 3: Length 2B Unit 13 ch 2: Bar Graphs
6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.	Number lines not covered as a separate topic from measurement or graphs. 2B Unit 13 ch 2: Bar Graphs
Work with time and money.	
7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	2B Unit 11 ch 1: Telling Time After the Hour 2B Unit 11 ch 2: Telling Time Before the Hour 1B Unit 11 ch 3: Time Intervals

8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*	2B Unit 9 ch 1: Dollars and Cents see workbook 2B p. 192. More in 1B.
Represent and interpret data.	
9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.	2B Unit 13 ch 2: Bar Graphs (not specifically comparing lengths only)
10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems4 using information presented in a bar graph.	2B Unit 13 ch 1: Picture Graphs
Geometry 2.G	
Reason with shapes and their attributes.	
1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.	2B Unit 14 ch 1: Flat and Curved Faces (Does not include pentagons and hexagons)
2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	Arrays and counting rows and columns covered in multiplication chapters. See 2A textbook p. 111, 2B textbook p. 25
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*, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	2B Unit 10 ch 1: Halves and Quarters 1B Unit 10 ch 2: Writing Fractions

Common Core State Standards for Grade 3 ↔ Primary Mathematics Standards Edition

Operations and Algebraic Thinking 3.OA	
Represent and solve problems involving multiplication and division.	
1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.	3A Unit 3: Multiplication and Division (also 2A Unit 5: Multiplication and Division)
2. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 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.	3A Unit 3: Multiplication and Division (also 2A Unit 5: Multiplication and Division)
3. 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.	3A Unit 3: Multiplication and Division
4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers.	3A Unit 3: Multiplication and Division 3A unit 4: Multiplication Tables of 6, 7, 8, and 9
Understand properties of multiplication and the relationship between multiplication and division.	
5. Apply properties of operations as strategies to multiply and divide.	3A Unit 3: Multiplication and Division 3A unit 4: Multiplication Tables of 6, 7, 8, and 9
6. Understand division as an unknown-factor problem.	3A Unit 3: Multiplication and Division 3A unit 4: Multiplication Tables of 6, 7, 8, and 9
Multiply and divide within 100.	
7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	3A Unit 3: Multiplication and Division 3A unit 4: Multiplication Tables of 6, 7, 8, and 9 (Multiplication tables of 2, 3, 4, 4 and 10 (including division) in Primary Mathematics 2.)
Solve problems involving the four operations, and identify and explain patterns in arithmetic.	
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.	3A Unit 3 ch 4: Estimation 3A Unit 2 ch 4: Word Problems 3A Unit 2 ch 7: Two-Step Word Problems 3A Unit 3 ch 2: More Word Problems also see 3A textbook pp. 46, 88, 136 Additional word problems throughout. Symbols used for unknowns, not letters.
9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.	3A Unit 3: Multiplication and Division 3A unit 4: Multiplication Tables of 6, 7, 8, and 9
Number and Operations in Base Ten 3.NBT	
1. Use place value understanding to round whole numbers to the nearest 10 or 100.	3A Unit 1 ch 3: Rounding Numbers

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.	3A Unit 2 ch 5: Adding Ones, Tens, Hundreds and Thousands 3A Unit 2 ch 6: Subtracting Ones, Tens, Hundreds and Thousands
3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	3A Unit 3 ch 3: Multiplying Ones, Tens, Hundreds and Thousands (pp. 82-84)
Number and Operations—Fractions 5 3.NF	
Develop understanding of fractions as numbers.	
1. Understand a fraction 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a*/*b* as the quantity formed by *a* parts of size 1/*b*.	3B Unit 10 ch 1: Fractions of a Whole
2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.	Number bars used rather than number lines. Number lines in 4A.
a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.	3B textbook pp. 86, 92, 97 (number bars rather than number lines) 4A Unit 3 ch 1: Equivalent Fractions
b. Represent a fraction *a*/*b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line.	3B textbook pp. 86, 92, 97 (number bars rather than number lines) 4A Unit 3 ch 1: Equivalent Fractions
3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.	3B Unit 10 ch 2: Equivalent Fractions
a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	3B Unit 10 ch 2: Equivalent Fractions
b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.	3B Unit 10 ch 2: Equivalent Fractions
c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.	3B Unit 10 ch 2: Equivalent Fractions
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 >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	3B Unit 10 ch 1: Fractions of a Whole (see 3B workbook p. 157)
Measurement and Data 3.MD	
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	
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.	3B Unit 11 ch 1: Hours and Minutes

2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). 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.	3B Unit 7: Weight 3B Unit 8: Capacity (Word problems are two-step, and multiplicative comparison problems are not excluded, as per footnote in CCSSI standards: [7]Excludes multiplicative comparison problems (problems involving notions of "times as much"; see Glossary, Table 2).)
Represent and interpret data.	
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.*	3A Unit 5 ch 1: Presenting data (Counting squares instead of using vertical and horizontal scales in Primary Mathematics 2. Unit 13)
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.	3A Unit 5 ch 1: Presenting data (Data not restricted to length, bar graphs include vertical and horizontal scales marked off in appropriate units, e.g., weight in kg,)
Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	
5. Recognize area as an attribute of plane figures and understand concepts of area measurement.	
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.	3B Unit 13 ch 1: Area
b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.	3B Unit 13 ch 1: Area
6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	3B Unit 13 ch 1: Area (Improvised units, square cm and square in., other units in 4A Unit 5.)
7. Relate area to the operations of multiplication and addition.	Not in Primary Mathematics 3.
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.	4A Unit 5 ch 1: Area of Rectangles
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.	4A Unit 5 ch 1: Area of Rectangles
c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.	4A Unit 5 ch 1: Area of Rectangles
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.	4A Unit 5 ch 1: Area of Rectangles 4A Unit 5 ch 3: Composite Figures

Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	
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.	3B Unit 13 ch 2: Perimeter (Finding unknown side lengths in 4A Unit 5 ch 2: Perimeter of Rectangles)
Geometry 3.G	
Reason with shapes and their attributes.	
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.	3B Unit 12 ch 3: Quadrilaterals and Triangles
2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.	3B Unit 10 ch 1: Fraction of a Whole

Operations and Algebraic Thinking 4.OA	
Use the four operations with whole numbers to solve problems.	
1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	4A Unit 2 ch 2: Multiplication and Division (review) 3A Unit 3 ch 2: More Word Problems
2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	4A Unit 2 ch 2: Multiplication and Division (review) 3A Unit 3 ch 2: More Word Problems 3B Unit 7 ch 2: Word Problems
3. Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	4A Unit 2 ch 2: Multiplication and Division (review) See word problems in 4A textbook p. 73, 76, 4A workbook pp. 54-55. Primarily review of Primary Mathematics 3. 3A Unit 3 ch 2: More Word Problems 3A Unit 4: Multiplication Tables of 6, 7, 8 and 9. 3B Unit 7 ch 2: Word Problems
Gain familiarity with factors and multiples.	
4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.	4A Unit 1 ch 3: Factors 4A Unit 1 ch 4: Multiples
Generate and analyze patterns.	
5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.	4A Unit 1 ch 4: Multiples, p. 34 for divisibility patterns. 4A Unit 9 ch 2: Changes in Quantities
Number and Operations in Base Ten 2 4.NBT	
Generalize place value understanding for multi-digit whole numbers.	
1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.	4A Unit 1 ch 1: Ten Thousands, Hundred Thousands and Millions.
2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	4A Unit 1 ch 1: Ten Thousands, Hundred Thousands and Millions. (See 4A textbook p. 21 for use of symbols.)
3. Use place value understanding to round multi-digit whole numbers to any place.	4A Unit 2 ch 2: Approximation

Use place value understanding and properties of operations to perform multi-digit arithmetic.	
4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.	4A Unit 2 ch 1: Addition and Subtraction (review) 3A Unit 2 chs 5 and 6
5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	4A Unit 2 ch 2: Multiplication and Division (review) 3A Unit 4: Multiplication Tables of 6, 7, 8 and 9. 4A Unit 2 ch 3: Multiplication by a 2-Digit Number
6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	4A Unit 2 ch 2: Multiplication and Division (review) 3A Unit 3 ch 4: Quotient and Remainder 3A Unit 3 ch 5: Dividing Hundreds, Tens and Ones 3A Unit 4: Multiplication Tables of 6, 7, 8 and 9.
Number and Operations—Fractions 3 4.NF	
Extend understanding of fraction equivalence and ordering.	
1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	4A Unit 3 ch 1: Equivalent Fractions (review) 3B Unit 10 ch 2: Equivalent Fractions
2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	4A Unit 3 ch 1: Equivalent Fractions (review) 3B Unit 10 ch 2: Equivalent Fractions (see 4A workbook p. 87 for use of symbols.)
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	(Primary Mathematics 4A includes addition and subtraction of related fractions.)
3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.	
a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	4A Unit 3 ch 2: Adding and Subtracting Fractions 3B Unit 10 ch 3: Adding Fractions 3B Unit 10 ch 4: Subtracting Fractions
b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.	4A Unit 3 ch 2: Adding and Subtracting Fractions 3B Unit 10 ch 3: Adding Fractions 3B Unit 10 ch 4: Subtracting Fractions 4A Unit 3 ch 4: Improper Fractions
c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.	4A Unit 3 ch 3: Mixed Numbers 4A Unit 3 ch 4: Improper Fractions
d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	4A Unit 3 ch 2: Adding and Subtracting Fractions 3B Unit 10 ch 3: Adding Fractions 3B Unit 10 ch 4: Subtracting Fractions

4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	4A includes fraction of a set, multiplying a fraction by a whole number. 4A Unit 3 ch 6: Fraction of a Set
a. Understand a fraction *a*/*b* as a multiple of 1/*b*.	4A Unit 3 ch 6: Fraction of a Set 5A Unit 3 ch 5: Multiplying a Fraction and a Whole Number
b. Understand a multiple of *a*/*b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number.	4A Unit 3 ch 6: Fraction of a Set 5A Unit 3 ch 5: Multiplying a Fraction and a Whole Number
c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.	4A has word problems for fraction of a set. See 4A textbook pp. 102-104 5A Unit 3 ch 5: Multiplying a Fraction and a Whole Number 5A Unit 3 ch 6: Fraction of a Set
Understand decimal notation for fractions, and compare decimal fractions.	
5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.	4B Unit 6 ch 1: Tenths 4B Unit 6 ch 2: Hundredths See 4B textbook p. 15, 17 and 4A workbook p. 21
6. Use decimal notation for fractions with denominators 10 or 100.	4B Unit 6 ch 1: Tenths 4B Unit 6 ch 2: Hundredths
7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	4B Unit 6 ch 1: Tenths 4B Unit 6 ch 2: Hundredths (see 4B textbook pp. 21, 27 for use of symbols.)
Measurement and Data 4.MD	
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	Conversion of measurement primarily covered in Primary Mathematics 3B.
1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.	3B Unit 6: Length 3B Unit 7: Weight 3B Unit 8 Capacity Only partial tables for illustration; conversion is done using multiplication rather than referring to a table.
2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	4B unit 11 ch 1: Adding and Subtracting Measures 4B Unit 11 ch 2: Multiplying Measures 4B Unit 11 ch 3: Dividing Measures Word problems involving measurement conversion, intervals of time and money also in Primary Mathematics 3B. See 4A textbook pp. 80, 87, 101, 140 for word problems with fractions and measurement. See 4B textbook pp. 35, 45, 46, 57, 68, 69 for word problems involving decimals and measurement or money.

3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems.	4A Unit 5 ch 1: Area of Rectangles 4A Unit 5 ch 2: Perimeter of Rectangles 4A Unit 5 ch 3: Composite Figures For some specific word problems see 4A textbook pp 144, 150, 156
Represent and interpret data.	
4. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.	This particular example is not specifically covered except as a possible data collection activity among others. Line plots, bar graphs with scaled horizontal or vertical axes and line graphs and interpreting data are covered, but not specifically tied to fractions on a number line. 4A Unit 10 ch 1: Organizing and Analyzing Data 4A Unit 10 ch 2: Probability Experiments (for line plots) 4A Unit 10 ch 4: Bar Graphs 4A Unit 10 ch 5: Line Graphs
Geometric measurement: understand concepts of angle and measure angles.	
5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:	
a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.	4A Unit 4 ch 1: Right Angles 4A Unit 4 ch 2: Measuring Angles
b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.	4A Unit 4 ch 1: Right Angles 4A Unit 4 ch 2: Measuring Angles
6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	4A Unit 4 ch 1: Right Angles 4A Unit 4 ch 2: Measuring Angles
7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	4A Unit 4 ch 2: Measuring Angles See 4A textbook p. 115 for additive property 5A Unit 10 ch 2: Finding Unknown Angles (for supplementary and complementary angles)
Geometry **4.G**	
Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	
1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	4A Unit 4 ch 3: Perpendicular Lines 4A Unit 4 ch 4: Parallel Lines 4A Unit 4 ch 5: Quadrilaterals

2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	4A Unit 4 ch 5: Quadrilaterals 4A Unit 4 ch 6: Triangles
3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	4B Unit 8 ch 3: Line Symmetry

Operations and Algebraic Thinking 5.OA	
Write and interpret numerical expressions.	
1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	5A Unit 2 ch 1: Calculations with Parentheses 4A Unit 1 ch 5: Order of Operations
2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.	5A Unit 2 ch 1: Calculations with Parentheses 5A textbook pp. 32-33 (missing numbers are to be found without evaluating the expressions) Also problems for Q7, 5A textbook p. 49, 5A workbook p. 24. Students also write expressions using parentheses from information in word problems, e.g., Q1, 5A textbook p. 33.
Analyze patterns and relationships.	
3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.	5B Unit 13 ch 3: Coordinate Graphs (see 5A textbook pp. 162-163) (also 4A Unit 9 ch 2: Changes in Quantities) (also patterns for multiplication in Primary Mathematics 3A)
Number and Operations in Base Ten 5.NBT	
Understand the place value system.	
1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	5A Unit 1 ch 1: Billions
2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	5A Unit 1 ch 5: Multiplying by Tens, Hundreds or Thousands 5B Unit 7 ch 5: Multiplication by Tens, Hundreds or Thousands
3. Read, write, and compare decimals to thousandths.	
a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$	5B Unit 1 ch 1: Tenths, Hundredths and Thousandths 4B Unit 6: Decimals 4B Unit 6 ch 3: Thousandths
b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	5B Unit 1 ch 1: Tenths, Hundredths and Thousandths (See 5B textbook p. 11 for use of symbols.)
4. Use place value understanding to round decimals to any place.	5B Unit 1 ch 2: Approximation
Perform operations with multi-digit whole numbers and with decimals to hundredths.	
5. Fluently multiply multi-digit whole numbers using the standard algorithm.	5A Unit 2 ch 4: Multiplication by a 2-Digit Whole Number (review) 4A Unit 2 ch 2: Multiplication by a 2-digit Number 3A Unit 3: Multiplication and Division

6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	5A Unit 2 ch 5: Division by a 2-Digit Whole Number (Division of multi-digit whole number by a 1-digit whole number using the standards algorithm covered extensively in Primary Mathematics 3A and reviewed in Primary Mathematics 4A.)
7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	5B Unit 1: Decimals 4B Unit 7: The Four Operations on Decimals
Number and Operations—Fractions 5.NF	
Use equivalent fractions as a strategy to add and subtract fractions.	
1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.	5A Unit 3 ch 3: Addition and Subtraction of Unlike Fractions. 5A Unit 3 ch 4: Addition and Subtraction of Mixed Numbers.
2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.	5A textbook p. 60, see p. 61 for a visual model. 4A Unit 3 ch 2: Adding and Subtracting Fractions 5A Unit 3 ch 7: Word Problems (multi-step) Lots of word problems throughout. Estimation in adding and subtracting fractions not specifically covered but students are taught to assess reasonableness of answers.
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	
3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	5A Unit 3 ch 2: Fractions and Division
4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	
a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.	5A unit 3 ch 5: Multiplying a Fraction and a Whole Number 5A Unit 3 ch 6: Fraction of a Set 5A Unit 4 ch 1: Product of Fractions
b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	5A Unit 4 ch 1: Product of Fractions
5. Interpret multiplication as scaling (resizing), by:	
a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	5A Unit 4 ch 1: Product of Fractions See p. 80 in text. Covered with use of bar models throughout.

b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	5A Unit 4 ch 1: Product of Fractions Multiplication of a mixed number by a whole number is covered in conversion of a mixed number measurement to a smaller measurement unit, see 5A textbook p. 71, also in 5B when converting decimal to fraction to convert measurements.
6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	5A Unit 3 ch 7: Word Problems 5A Unit 4 ch 2: Word Problems
7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.	
a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.	5A Unit 4 ch 3: Dividing a Fraction by a Whole Number
b. Interpret division of a whole number by a unit fraction, and compute such quotients.	5A Unit 4 ch 5: Dividing by a Fraction
c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.	5A Unit 4 ch 3: Dividing a Fraction by a Whole Number 5A Unit 4 ch 5: Dividing by a Fraction 5A Unit 4 ch 5: More Word Problems (See 5A textbook pp. 90, 91, 103)
Measurement and Data 5.MD	
Convert like measurement units within a given measurement system.	
1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	5B Unit 8 ch 1: Conversion of Measures
Represent and interpret data.	
2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.	This specific example for collecting data and displaying and interpreting it is not covered. 5B Unit 12 Data Analysis (includes histograms, and line graphs with scaled horizontal or vertical axes)
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	
3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	
a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	5B Unit 8 ch 2 Volume of Rectangular Prisms (review) 4B Unit 11 ch 4: Cubic Units 4B Unit 11 ch 5: Volume of Rectangular Prisms 3B Unit 13 ch 3: Volume

b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.	5B Unit 8 ch 2 Volume of Rectangular Prisms (review) 4B Unit 11 ch 4: Cubic Units 4B Unit 11 ch 5: Volume of Rectangular Prisms 3B Unit 13 ch 3: Volume
4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	5B Unit 8 ch 2 Volume of Rectangular Prisms (review) 4B Unit 11 ch 4: Cubic Units 4B Unit 11 ch 5: Volume of Rectangular Prisms 3B Unit 13 ch 3: Volume
5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	
a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.	5B Unit 8 ch 2 Volume of Rectangular Prisms 4B Unit 11 ch 5: Volume of Rectangular Prisms
b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	5B Unit 8 ch 2 Volume of Rectangular Prisms 4B Unit 11 ch 5: Volume of Rectangular Prisms
c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	5B Unit 8 ch 2 Volume of Rectangular Prisms 4B Unit 11 ch 5: Volume of Rectangular Prisms
Geometry 5.G	
Graph points on the coordinate plane to solve real-world and mathematical problems.	
1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).	5B Unit 13 ch 3: Coordinate Graphs 4B Unit 9: Coordinate Graphs and Changes in Quantities
2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	5B Unit 13 ch 3: Coordinate Graphs 4B Unit 9: Coordinate Graphs and Changes in Quantities

Classify two-dimensional figures into categories based on their properties.	
3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*	5A Unit 10 ch 4: Isosceles and Equilateral Triangle 5A Unit 10 ch 7: Parallelograms, Rhombuses and Trapezoids (Basic attributes have been covered earlier) 4A Unit 4 ch 5: Quadrilaterals 4A unit 4 ch 6: Triangles
4. Classify two-dimensional figures in a hierarchy based on properties.	5A Unit 10 ch 4: Isosceles and Equilateral Triangle 5A Unit 10 ch 7: Parallelograms, Rhombuses and Trapezoids (textbook p 95 is a review) 4A Unit 4 ch 5: Quadrilaterals 4A unit 4 ch 6: Triangles

Ratios and Proportional Relationships 6.RP	
Understand ratio concepts and use ratio reasoning to solve problems.	
1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.	6A Unit 5 ch 1: Comparing Quantities I
2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.	6A Unit 5 ch 1: Comparing Quantities II 6A Unit 5 ch 5: Proportion 6A Unit 6 ch 1: Rate I 5A Unit 6 ch 1: Finding Ratio 5A Unit 6 ch 2: Equivalent Ratios 5A Unit 11 ch 2: Rate
3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.	
a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	6A Unit 5 ch 4: Word Problems 6A Unit 5 ch 5: Proportion 6A Unit 1 ch 4: Graphs of Functions 5A Unit 6 ch 1: Finding Ratio 5B Unit 11 ch 3: Coordinate Graphs
b. Solve unit rate problems including those involving unit pricing and constant speed.	6A Unit 6 ch 1: Rate I 6A Unit 6 ch 2: Rate II 6A Unit 6 ch 3: Speed 5A Unit 11 ch 2: Rate
c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.	6A Unit 4 ch 1: Percentage of a Quantity 6A Unit 4 ch 2: Percentage Change
d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	5B Unit 8 ch 1: Conversion of Measurement
The Number System 6.NS	
Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	
1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.	6A Unit 3 ch 2: Multiplication and Division of Fractions 5A Unit 4 ch 4: Dividing by a Fractions
Compute fluently with multi-digit numbers and find common factors and multiples.	
2. Fluently divide multi-digit numbers using the standard algorithm.	Division is not retaught in 6. 5A Unit 2 ch 5: Division by a 2-Digit Whole Number 4A Unit 2 ch 2: Multiplication and Division (review) 3A Unit 3 ch 4: Quotient and Remainder 3A Unit 3 ch 5: Dividing Hundreds, Tens and Ones 3A Unit 4: Multiplication Tables of 6, 7, 8 and 9.

3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	Students have been adding and subtracting decimals and multiplying and dividing decimals by a 1-digit whole number since Primary Mathematics 4, and multiplying and dividing decimals since Primary Mathematics 5. it is not retaught in 6 but is used. 6A textbook pp. 85, 88, 116, 128, 129 5B Unit 7: Decimals 4B Unit 7: The Four Operations on Decimals
4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.	5A Unit 1 ch 3: Factors and Multiple 5A Unit 2 ch 1: Calculations with Parentheses
Apply and extend previous understandings of numbers to the system of rational numbers.	
5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	6A Unit 2 ch 2: Negative Fractions and Decimals 5B Unit 13 ch 2: Integers 4A Unit 1 ch 6: Negative Numbers
6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	
a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.	6A Unit 2 ch 2: Negative Fractions and Decimals 6B Unit 13 ch 1: Addition and Subtraction 6B Unit 13 ch 3: Order of Operations 5B Unit 14 ch 1: Addition and Subtraction 5B Unit 13 ch 2: Integers
b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	6B Unit 12 ch 3 Coordinate Graphs 5B Unit 13 ch 3: Coordinate Graphs
c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	6A Unit 2 ch 2: Negative Fractions and Decimals 6B Unit 12 ch 3 Coordinate Graphs 5B Unit 13 ch 2: Integers 5B Unit 13 ch 3: Coordinate Graphs 4A Unit 1 ch 6: Negative Numbers
7. Understand ordering and absolute value of rational numbers.	
a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.	6A Unit 2 ch 3 Comparing Numbers 5B Unit 13 ch 2: Integers 4A Unit 1 ch 6: Negative Numbers

b. Write, interpret, and explain statements of order for rational numbers in real-world contexts.	6A Unit 2 ch 3 Comparing Numbers 5B Unit 13 ch 2: Integers 4A Unit 1 ch 6: Negative Numbers
c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.	6A Unit 2 ch 2: Negative Fractions and Decimals 6A Unit 2 ch 3 Comparing Numbers (absolute value symbol |-x| not used)
d. Distinguish comparisons of absolute value from statements about order.	6A Unit 2 ch 2: Negative Fractions and Decimals 5B Unit 13 ch 2: Integers 4A Unit 1 ch 6: Negative Numbers
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.	6B Unit 1 ch 4: Graphs of Functions 5B Unit 13 ch 3: Coordinate Graphs 4B Unit 9 ch 1: The Coordinate Grid
Expressions and Equations 6.EE	
Apply and extend previous understandings of arithmetic to algebraic expressions.	
1. Write and evaluate numerical expressions involving whole-number exponents.	6B textbook p. 17, 21, 6B Unit 13 ch 3: Order of Operations 5A textbook p. 21
2. Write, read, and evaluate expressions in which letters stand for numbers.	
a. Write expressions that record operations with numbers and with letters standing for numbers.	6A Unit 1 ch 1 Algebraic Expressions I 5B Unit 13 ch 1: Algebraic Expressions
b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.	6A Unit 1 ch 1 Algebraic Expressions I 5B Unit 13 ch 1: Algebraic Expressions 5A Unit 2 ch 1: Calculations with Parentheses
c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).	6A Unit 1 ch 1 Algebraic Expressions I 6A Unit 1 ch 3 Algebraic Expressions II 6B Unit 13 ch 1: Addition and Subtraction 6B Unit 13 ch 2: Multiplication and Division 6B Unit 13 ch 3: Order of Operation 5B Unit 13 ch 1: Algebraic Expressions
3. Apply the properties of operations to generate equivalent expressions.	6B Unit 13 ch 3: Order of Operation 5B Unit 13 ch 1: Algebraic Expressions
4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).	6B Unit 13 ch 3: Order of Operation 5B Unit 13 ch 1: Algebraic Expressions

Reason about and solve one-variable equations and inequalities.	
5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	6A Unit 1 ch 2: Algebraic Equations 6A Unit 1 ch 4: Graphs of Functions 6B Unit 13 ch 4: Solving Equations 6B Unit 13 ch 5: Graphs of Functions Does not include inequalities. Equations are solved by solving for the unknown, not testing values from a specified set.
6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	6A Unit 1 ch 2: Algebraic Equations 6A Unit 1 ch 4: Graphs of Functions 6B Unit 13 ch 4: Solving Equations 6B Unit 13 ch 5: Graphs of Functions
7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.	6A Unit 1 ch 2: Algebraic Equations 6A Unit 1 ch 4: Graphs of Functions 6B Unit 13 ch 4: Solving Equations 6B Unit 13 ch 5: Graphs of Functions 6B includes equations with negative integers.
8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	Not specifically covered.
Represent and analyze quantitative relationships between dependent and independent variables.	
9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.	6A Unit 1 ch 4: Graphs of Functions 6B Unit 13 ch 5: Graphs of Functions 6A Unit 1: Algebra 6A Unit 6: Rate II 6A textbook p. 88, 105 6B textbook p. 17, 21, 32, 34, 53, 59
Geometry 6.G	
Solve real-world and mathematical problems involving area, surface area, and volume.	
1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	5A Unit 5: Perimeter, Area and Surface Area
2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	5A Unit 8 ch 2: Volume of Rectangular Prisms 6A Unit 8 ch 1: Volume of Prisms

3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	4B Unit 9 ch 1: The Coordinate Grid
4. Represent three-dimensional figures 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.	5B Unit 5 ch 5: Surface Area

Statistics and Probability 6.SP	
Develop understanding of statistical variability.	
1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	6B Unit 11: Data Handling
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.	6B Unit 11: Data Handling
3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	6B Unit 11: Data Handling
Summarize and describe distributions.	
4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	6B Unit 11: Data Handling 5A Unit 12: Data Analysis (box plots not covered)
5. Summarize numerical data sets in relation to their context, such as by:	
a. Reporting the number of observations.	6B Unit 11: Data Handling
b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	6B Unit 11: Data Handling
c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.	6B Unit 11: Data Handling
d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	6B Unit 11: Data Handling