SADLIER

Progress in Mathematics

Aligned to the

Archdiocese of Detroit

Fifth Grade Mathematics Standards

Grade 5

Sadlier
William H. Sadlier, Inc.
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Operations and Algebraic Thinking

Archdiocese of Detroit: Fifth Grade Mathematics Standards		Sadlier *Progress in Mathematics*, Grade 5
Write and interpret numerical expressions.		
5.OA.A.1	• Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	**2-2 Properties of Multiplication**—pp. 68–69 Objective(s): To understand and apply the properties of multiplication. **3-14 Order of Operations**—pp. 122–123 Objective(s): To use the order of operations to evaluate numerical expressions. ***3-14A Variables and Expressions**—Online Objective(s): To write numerical expressions to describe a series of operations given in a word phrase. To write algebraic expressions to describe a series of operations given in a word phrase. To compare expressions without evaluating them.
5.OA.A.2	• Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	**2-2 Properties of Multiplication**—pp. 68–69 Objective(s): To understand and apply the properties of multiplication. ***3-14A Variables and Expressions**—Online Objective(s): To write numerical expressions to describe a series of operations given in a word phrase. To write algebraic expressions to describe a series of operations given in a word phrase. To compare expressions without evaluating them. **14-1 Algebraic Expressions and Equations**—pp. 440–441 Objective(s): To distinguish between and write algebraic expressions and equations. To evaluate algebraic expressions and equations. **14-2 Properties of Equality**—pp. 442–443 Objective(s): To understand and apply the properties of equality.
Analyze patterns and relationships.		
5.OA.B.3	• Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	***14-13B Sequences**—Online Objective(s): To use an iterative rule to extend a sequence. To write the iterative rule for a sequence. To graph ordered pairs identified in a pattern on a coordinate plane. ***14-13C Compare Sequences**—Online Objective(s): To identify the relationships between corresponding terms in two sequences. **14- 14 Function Tables**—pp. 466–467 Objective(s): To complete a function table. To find the rule given a function table.

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Number and Operations in Base Ten

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Understand the place value system.		
5.NBT.A.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.	**1-1 What Is a Billion**?—pp. 30–31 Objective(s): To use number sense and place value to explore the magnitude of 1,000,000,000. **1-2 Place Value to Billions**—pp. 32–33 Objective(s): To extend place value through the billions period. To read and write whole numbers through billions in words, standard form, and short word name form. **1-3 Expanded Form**—pp. 34–35 Objective(s): To write numbers in expanded and standard form. ***1-3A Powers of Ten**—Online Objective(s): To use exponents to represent powers of ten. To use powers of ten to represent place value. **1-4 Thousandths**—pp. 36–37 Objective(s): To read and write decimals through thousandths in words and in standard form. ***1-4A Decimals and Expanded Form**—Online Objective(s): To write decimals through thousandths in expanded form and vice versa. To recognize that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left. **1-5 Decimals Greater Than One**—pp. 38–39 Objective(s): To read and write decimals with values greater than one in words and in standard form. **8-2 Decimals and Place Value**—pp. 270–271 Objective(s): To identify place value in decimals. To read and write decimals through thousandths in standard and expanded form.
5.NBT.A.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.	***1-3A Powers of Ten**—Online Objective(s): To use exponents to represent powers of ten. To use powers of ten to represent place value. **2-3 Mental Math Special Factors**—pp. 70–71 Objective(s): To use the pattern for multiplying by 10 and multiples of 10 as a shortcut. **2-4 Patterns in Multiplication**—pp. 72–73 Objective(s): To use a pattern as a shortcut when multiplying whole numbers by 100, 1000, or their multiples. **9-1 Multiply by 10, 100, and 1000**—pp. 294–295 Objective(s): To multiply decimals by 10, 100, and 1000, and by multiples of 10 and 100. **9-6 Divide by 10, 100, and 1000**—pp. 304–305 Objective(s): To divide decimals and whole numbers by 10, 100, and 1000.
5.NBT.A.3	• Read, write, and compare all decimals.	
5.NBT.A.3a	• Read and write decimals using standard form, word form, and expanded form (using fractions, decimals, and exponents), e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).	**1-4 Thousandths**—pp. 36–37 Objective(s): To read and write decimals through thousandths in words and in standard form. ***1-4A Decimals and Expanded Form**—Online Objective(s): To write decimals through thousandths in expanded form and vice versa. To recognize that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left.

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		1-5 Decimals Greater Than One—pp. 38–39 Objective(s): To read and write decimals with values greater than one in words and in standard form. **8-2 Decimals and Place Value**—pp. 270–271 Objective(s): To identify place value in decimals. To read and write decimals through thousandths in standard and expanded form.
5.NBT.A.3b	• Compare two decimals based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**1-6 Compare and Order Numbers**—pp. 40–41 Objective(s): To compare and order whole numbers and decimals. **8-1 Decimal Sense**—pp. 268–269 Objective(s): To locate decimals on a number line.
5.NBT.A.4	• Use place value understanding to round decimals to any place.	**1-7 Rounding Numbers**—pp. 42–43 Objective(s): To round whole numbers, decimals, and money to a given place or to the greatest place. **8-4 Estimate Decimal Sums** (rounding)—pp. 274–275 Objective(s): To estimate decimal sums. **8-7 Estimate Decimal Differences** (rounding)—pp. 280–281 Objective(s): To estimate decimal differences. **9-2 Estimate Decimal Products** (rounding)—pp. 296–297 Objective(s): To use rounding to estimate decimal products. To use clustering to estimate decimal sums. **9-10 Estimate with Money: Rounding to the Nearest Cent**—p. 313 Objective(s): To round quotients to the nearest cent.
Perform operations with multi-digit whole numbers and with decimals to hundredths.		
5.NBT.B.5	• Fluently multiply multi-digit whole numbers using the standard algorithm.	**2-6 Zeros in the Multiplicand**—pp. 76–77 Objective(s): To multiply with zeros in the multiplicand. **2-7 Multiply Two Digits**—pp. 78–79 Objective(s): To multiply a whole number by a 2-digit multiplier. **2-8 Multiply Three Digits**—pp. 80–81 Objective(s): To multiply a whole number by a 3-digit multiplier. **2-9 Zeros in the Multiplier**—pp. 82–83 Objective(s): To multiply with zeros in the multiplier.
5.NBT.B.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.	**3-2 Division Patterns**—pp. 98–99 Objective(s): To use division facts and patterns with zero to divide by multiples of 10, 100, and 1000. **3-3 Three-Digit Quotients**—pp. 100–101 Objective(s): To divide 3- and 4-digit dividends by 1-digit divisors, resulting in 3-digit quotients with and without remainders. **3-5 Zeros in the Quotient**—pp. 104–105 Objective(s): To divide by 1-digit divisors to obtain quotients with one or more zeros. **3-6 Short Division**—pp. 106–107 Objective(s): To use short division when dividing by 1-digit divisors. ***3-9A Use Arrays to Divide**—Online Objective(s): To find quotients using properties of operations. To use rectangular arrays to find quotients. To explain a calculation using an equation. **3-10 Teens as Divisors**—pp. 114–115 Objective(s): To divide by divisors from 11 through 19.

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		***3-10A Use Strategies to Divide**—Online Objective(s): To use the relationship between multiplication and division to find quotients. **3-11 Two-Digit Divisors**—pp. 116–117 Objective(s): To divide 3- and 4-digit dividends by 2-digit divisors.
5.NBT.B.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.	**2-10 Multiplication with Money—pp. 84–85** Objective(s): To multiply money amounts. **3-13 Divide Money—pp. 120–121** Objective(s): To divide money amounts by 1- and 2-digit divisors. ***8-2A Use Models to Add Decimals—Online** Objective(s): To use concrete objects and drawings to add decimals. To use the properties of operations to add decimals. ***8-2B Mental Math Add Decimals—Online** Objective(s): To use the commutative and associative properties of addition and mental math to add decimals. **8-3 Add Decimals—pp. 272–273** Objective(s): To add two or three decimals through hundredths. **8-4 Estimate Decimal Sums—pp. 274–275** Objective(s): To estimate decimal sums. **8-5 Add More Decimals—pp. 276–277** Objective(s): To add two or three decimals through thousandths. ***8-5A Use Models to Subtract Decimals—Online** Objective(s): To use concrete objects and drawings to subtract decimals. To use the properties of operations and the relationship between addition and subtraction to subtract decimals. **8-6 Subtract Decimals—pp. 278–279** Objective(s): To subtract decimals through hundredths. **8-8 Subtract More Decimals—pp. 282–283** Objective(s): To subtract decimals through thousandths. **9-1 Multiply by 10, 100, and 1000—pp. 294–295** Objective(s): To multiply decimals by 10, 100, and 1000, and by multiples of 10 and 100. ***9-2A Multiply Decimals—Online** Objective(s): To use concrete objects and drawings to multiply a whole number by a decimal and vice versa. To use the properties of operations to multiply decimals. **9-3 Multiply Decimals by Whole Numbers—pp. 298–299** Objective(s): To multiply decimals by whole numbers. ***9-3A Model Multiplying Two Decimals—Online** Objective(s): To use an array model to multiply two decimals. To use the properties of operations to multiply decimals. **9-4 Multiply Decimals by Decimals—pp. 300–301** Objective(s): To multiply decimals by decimals. **9-5 Zeros in the Product—pp. 302–303** Objective(s): To write zeros as placeholders in decimal products. **9-6 Divide by 10, 100, and 1000—pp. 304–305** Objective(s): To divide decimals and whole numbers by 10, 100, and 1000. ***9-6A Model Dividing a Decimal by a Whole Number—Online** Objective(s): To use models to divide a decimal by any whole number. **9-7 Divide Decimals by Whole Numbers—pp. 306–307** Objective(s): To divide decimals by 1-digit whole numbers. **9-8 Zeros in Division—pp. 308–309** Objective(s): To divide decimals by 1-digit whole numbers, using zeros as placeholders in the quotient or dividend.

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		***9-8A Model Dividing a Decimal by a Decimal—Online** Objective(s): To model dividing a decimal by a decimal. ***9-8B Divide Decimals—Online** Objective(s): To use the properties of operations to divide two decimals.
5.NBT.B.8	• Multiply a multi-digit number by a three-digit number; recognize and be able to explain common computational errors such as not accounting for place value.	**2-8 Multiply Three Digits**—pp. 80–81 Objective(s): To multiply a whole number by a 3-digit multiplier.
5.NBT.B.9	• Solve applied problems involving multiplication and division of whole numbers.	**2-1 Factors and Products**—pp. 66–67 Objective(s): To understand and perform the operation of multiplication. **2-2 Properties of Multiplication**—pp. 68–69 Objective(s): To understand and apply the properties of multiplication. **2-3 Mental Math: Special Factors**—pp. 70–71 Objective(s): To use the pattern for multiplying by 10 and multiples of 10 as a shortcut. **2-4 Patterns in Multiplication**—pp. 72–73 Objective(s): To use a pattern as a shortcut when multiplying whole numbers by 100, 1000, or their multiples. **2-5 Estimate Products**—pp. 74–75 Objective(s): To estimate products of whole numbers and money amounts. **2-6 Zeros in the Multiplicand**—pp. 76–77 Objective(s): To multiply with zeros in the multiplicand. **2-7 Multiply Two Digits**—pp. 78–79 Objective(s): To multiply a whole number by a 2-digit multiplier. **2-8 Multiply Three Digits**—pp. 80–81 Objective(s): To multiply a whole number by a 3-digit multiplier. **2-9 Zeros in the Multiplier**—pp. 82–83 Objective(s): To multiply with zeros in the multiplier. **2-10 Multiplication with Money**—pp. 84–85 Objective(s): To multiply money amounts. **2-11 Problem-Solving Strategy: Use More Than One Step**—pp. 86–87 Objective(s): To find and utilize hidden information to solve problems. To solve problems using more than one step. **2-12 Problem Solving Applications: Mixed Review**—pp. 88–89 **3-1 Understanding Division**—pp. 96–97 Objective(s): To use multiplication facts to find related division facts. To understand the rules of division. **3-2 Division Patterns**—pp. 98–99 Objective(s): To use division facts and patterns with zero to divide by multiples of 10, 100, and 1000. **3-3 Three-Digit Quotients**—pp. 100–101 Objective(s): To divide 3- and 4-digit dividends by 1-digit divisors, resulting in 3-digit quotients with and without remainders. **3-4 Larger Quotients**—pp. 102–103 Objective(s): To divide larger dividends by 1-digit divisors. **3-5 Zeros in the Quotient**—pp. 104–105 Objective(s): To divide by 1-digit divisors to obtain quotients with one or more zeros. **3-6 Short Division**—pp. 106–107 Objective(s): To use short division when dividing by 1-digit divisors.

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		3-8 Divisibility and Mental Math—pp. 110–111 Objective(s): To use divisibility rules for 2, 3, 4, 5, 6, 9, and 10. **3-9 Estimation Compatible Numbers**—pp. 112–113 Objective(s): To estimate quotients using compatible numbers. ***3-9A Use Arrays to Divide**—Online Objective(s): To find quotients using properties of operations. To use rectangular arrays to find quotients. To explain a calculation using an equation. **3-10 Teens as Divisors**—pp. 114–115 Objective(s): To divide by divisors from 11 through 19. ***3-10A Use Strategies to Divide**—Online Objective(s): To use the relationship between multiplication and division to find quotients. **3-11 Two-Digit Divisors**—pp. 116–117 Objective(s): To divide 3- and 4-digit dividends by 2-digit divisors. **3-12 Divide Larger Numbers**—pp. 118–119 Objective(s): To divide larger dividends by 2-digit divisors. **3-13 Divide Money**—pp. 120–121 Objective(s): To divide money amounts by 1- and 2-digit divisors. **3-16 Problem Solving Applications: Mixed Review**—pp. 126–127
5.NBT.B.10	• Divide fluently up to a four-digit number by a two-digit number.	**3-10 Teens as Divisors**—pp. 114–115 Objective(s): To divide by divisors from 11 through 19. ***3-10A Use Strategies to Divide**—Online Objective(s): To use the relationship between multiplication and division to find quotients. **3-11 Two-Digit Divisors**—pp. 116–117 Objective(s): To divide 3- and 4-digit dividends by 2-digit divisors.
5.NBT.B.11	• Find the prime factorization of any composite numbers, express in exponential notation, and understand that every whole number greater than 1 is either prime or can be expressed as a product of primes.	**4-1 Explore Prime and Composite Numbers**—pp. 134–135 Objective(s): To explore prime and composite numbers using rectangular arrays. **4-2 Factors, Primes, and Composites**—pp. 136–137 Objective(s): To find the factors of a number. To identify prime and composite numbers. To find the prime factorization of a number.
5.NBT.B.12	• Understand percentages as parts out of 100, use % notation, and express a part of a whole as a percentage.	**13-4 Relate Fractions to Percents**—pp. 422–423 Objective(s): To discover the relationship between fractions and percents. To write fractions as percents and percents as fractions. **13-5 Relate Percents to Decimals**—pp. 424–425 Objective(s): To write percents as decimals and decimals as percents. To write money amounts less than one dollar as a percent of a dollar. **13-6 Find the Percent of a Number**—pp. 426–427 Objective(s): To find the percent of a number. **13-7 Use Percent**—pp. 428–429 Objective(s): To the percent of a number by reading a circle graph. To find the amount of discount.

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Express, Interpret and Use Ratios; Find Equivalences		
5.NBT.C.13	• Convert fractions to decimals and decimals to fractions.	
5.NBT.C.13a	• Convert fractions and decimals to percentages.	**13-4 Relate Fractions to Percents**—pp. 422–423 Objective(s): To discover the relationship between fractions and percents. To write fractions as percents and percents as fractions. **13-5 Relate Percents to Decimals**—pp. 424–425 Objective(s): To write percents as decimals and decimals as percents. To write money amounts less than one dollar as a percent of a dollar.
5.NBT.C.13b	• Convert percentages to fractions and decimals.	**13-4 Relate Fractions to Percents**—pp. 422–423 Objective(s): To discover the relationship between fractions and percents. To write fractions as percents and percents as fractions. **13-5 Relate Percents to Decimals**—pp. 424–425 Objective(s): To write percents as decimals and decimals as percents. To write money amounts less than one dollar as a percent of a dollar.
5.NBT.C.14	• Express ratios in several ways given applied situation (3 cups to 5 people); recognize and find equivalent ratios.	**13-1 Ratios as Fractions**—pp. 416–417 Objective(s): To write ratios in three forms. To write equal ratios.

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Number and Operations – Fractions

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Use equivalent fractions as a strategy to add and subtract fractions.		
5.NF.A.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. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	***5-1A Add Fractions with Unlike Denominators**—Online Objective(s): To model adding unlike fractions. To find the sum in simplest form of two fractions with unlike denominators. **5-2 Add Fractions Unlike Denominators**—pp. 166–167 Objective(s): To add fractions with unlike denominators. **5-3 Add Three Fractions**—pp. 168–169 Objective(s): To add three fractions. To apply the associative property of addition to fractions. **5-4 Add Mixed Numbers**—pp. 170–171 Objective(s): To add mixed numbers with like and unlike denominators. **5-5 Rename Mixed Number Sums**—pp. 172–173 Objective(s): To add mixed numbers, renaming sums. ***5-6A Subtract Fractions with Unlike Denominators**—Online Objective(s): To model subtracting unlike fractions. To find the difference in simplest form of two fractions with unlike denominators. **5-7 Subtract Fractions Unlike Denominators**—pp. 176–177 Objective(s): To find the percent of a number. **5-8 More Subtraction of Fractions**—pp. 178–179 Objective(s): To subtract fractions with compatible unlike denominators. ***5-8A Subtract Fractions and Whole Numbers from Mixed Numbers**—Online Objective(s): To subtract a fraction from a mixed number using visual models. To subtract a whole number from a mixed number using visual models. **5-9 Subtract Mixed Numbers**—pp. 180–181 Objective(s): To subtract mixed numbers. **5-10 Subtraction with Renaming**—pp. 182–183 Objective(s): To subtract mixed numbers from whole numbers. **5-11 More Renaming in Subtraction**—pp. 184–185 Objective(s): To subtract mixed numbers, renaming the minuends.
5.NF.A.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. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*	**4-4 Fraction Sense—pp. 140–141** Objective(s): determine whether a fraction is closer to 0, 1/2, or 1. To find equivalent fractions. **5-1 Rename Fraction Sums Like Denominators—pp. 164–165** Objective(s): To rename the sums of two fractions with like denominators. **5-2 Add Fractions Unlike Denominators**—pp. 166–167 Objective(s): To add fractions with unlike denominators. **5-3 Add Three Fractions**—pp. 168–169 Objective(s): To add three fractions. To apply the associative property of addition to fractions. **5-4 Add Mixed Numbers**—pp. 170–171 Objective(s): To add mixed numbers with like and unlike denominators. **5-5 Rename Mixed Number Sums**—pp. 172–173 Objective(s): To add mixed numbers, renaming sums. **5-7 Subtract Fractions Unlike Denominators**—pp. 176–177 Objective(s): To find the percent of a number. **5-8 More Subtraction of Fractions**—pp. 178–179 Objective(s): To subtract fractions with compatible unlike denominators.

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		5-9 Subtract Mixed Numbers—pp. 180–181 Objective(s): To subtract mixed numbers. ***5-9A Use Benchmark Fractions—Online** Objective(s): To use benchmark fractions and number sense to estimate and assess the reasonableness of answers to additions and subtractions involving fractions. **5-10 Subtraction with Renaming**—pp. 182–183 Objective(s): To subtract mixed numbers from whole numbers. **5-11 More Renaming in Subtraction**—pp. 184–185 Objective(s): To subtract mixed numbers, renaming the minuends. **5-12 Estimate Sums and Differences of Mixed Numbers**—pp. 186–187 Objective(s): To estimate sums and differences of mixed numbers. **5-13 Problem Solving Strategy: Work Backward**—pp. 188–189 Objective(s): To solve problems by working backward. **5-14 Problem Solving Applications: Mixed Review**—pp. 190–191
Apply and extend previous understandings of multiplication and division.		
5.NF.B.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. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	***6-7A Interpret the Remainder**—Online Objective(s): To interpret a fraction as division of the numerator and denominator. To interpret the remainder as a fraction.
5.NF.B.4	• Solve the equation *(a/b) × (c/d) = ac/bd. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15.*	
5.NF.B.4b	• 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.	**6-1 Multiply Fractions**—pp. 198–199 Objective(s): To explore multiplying a fraction by a fraction, using models. **6-2 Multiply Fractions by Fractions**—pp. 200–201 Objective(s): To multiply a fraction by a fraction. **6-6 Multiply Fractions and Mixed Numbers**—pp. 208–209 Objective(s): To multiply a fraction and a mixed number. ***12-5A Find Areas of Rectangles and Squares**—Online Objective(s): To find the area of a rectangle with fractional dimensions by tiling with unit squares of the appropriate unit fraction side lengths.

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5.NF.B.5	• Interpret multiplication as scaling (resizing), by:	
5.NF.B.5a	• 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.	***6-2B Scaling Fractions**—Online Objective(s): To identify that multiplying a number by a number greater than 1 increases its magnitude, whereas multiplying by a number less than 1 decreases its magnitude. To use mental math to find the result of multiplying a number by a fraction less than 1 or greater than 1.
5.NF.B.5b	• Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number 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.	***6-2B Scaling Fractions**—Online Objective(s): To identify that multiplying a number by a number greater than 1 increases its magnitude, whereas multiplying by a number less than 1 decreases its magnitude. To use mental math to find the result of multiplying a number by a fraction less than 1 or greater than 1.
5.NF.B.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.	**6-2 Multiply Fractions by Fractions**—pp. 200–201 Objective(s): To multiply a fraction by a fraction. **6-3 Multiply Fractions and Whole Numbers**—pp. 202–203 Objective(s): To multiply a fraction and a whole number. **6-4 Multiply Fractions Using the GCF**—pp. 204–205 Objective(s): To multiply fractions using the greatest common factor (GCF). **6-5 Rename Mixed Numbers as Fractions**—pp. 206–207 Objective(s): To express a mixed number as a fraction greater than one. **6-6 Multiply Fractions and Mixed Numbers**—pp. 208–209 Objective(s): To multiply a fraction and a mixed number. **6-7 Multiply Mixed Numbers**—pp. 210–211 Objective(s): To multiply mixed numbers. ***6-10B Word Problems Involving Fractions**—Online Objective(s): To solve problems by adding, subtracting, multiplying (a/b x q), or dividing (unit) fractions. To use visual models to represent problems.
5.NF.B.7	• Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.	
5.NF.B.7a	• Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*	***6-10A Division with a Unit Fraction**—Online Objective(s): To use an equation to represent a problem. To create a story context for division of a whole number by a unit fraction. **6-12 Divide Fractions by Whole Numbers**—pp. 220–221 Objective(s): To divide a fraction by a whole number.
5.NF.B.7b	• Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*	**6-8 Division of Fractions**—pp. 212–213 Objective(s): To explore the division of whole numbers and fractions by fractions, using models. **6-10 Divide Whole Numbers by Fractions**—pp. 216–217 Objective(s): To divide a whole number by a fraction. ***6-10A Division with a Unit Fraction**—Online Objective(s): To use an equation to represent a problem. To create a story context for division of a whole number by a unit fraction.

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Number and Operations – Fractions

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5.NF.B.7c	• 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. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*	**6-10 Divide Whole Numbers by Fractions**—pp. 216–217 Objective(s): To divide a whole number by a fraction. ***6-10A Division with a Unit Fraction**—Online Objective(s): To use an equation to represent a problem. To create a story context for division of a whole number by a unit fraction. ***6-10B Word Problems Involving Fractions**—Online Objective(s): To solve problems by adding, subtracting, multiplying (a/b x q), or dividing (unit) fractions. To use visual models to represent problems. **6-12 Divide Fractions by Whole Numbers**—pp. 220–221 Objective(s): To divide a fraction by a whole number.

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Integers

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Add and Subtract Integers and Rational Numbers		
5.I.A.1	• Understand integer subtraction as the inverse of integer addition.	**14-10 Subtract Integers**—pp. 458–459 Objective(s): To subtract integers.
5.I.A.2	• Add and subtract integers between -10 and 10. Use the number line and chip models for addition and subtraction.	**14-8 Add Integers with Like Signs** (number lines)—pp. 454–455 Objective(s): To add integers with like signs. **14-9 Add Integers with Unlike Signs** (number lines)—pp. 456–457 Objective(s): To add integers with unlike signs. **14-10 Subtract Integers** (counters)—pp. 458–459 Objective(s): To subtract integers. See also **14-6 Introduction to Integers**—pp. 450–451 Objective(s): To express numerical situations using integers. To locate integers on a number line.
5.I.A.3	• Add, subtract, multiply, and divide positive rational numbers fluently.	**14-8 Add Integers with Like Signs**—pp. 454–455 Objective(s): To add integers with like signs. **14-9 Add Integers with Unlike Signs**—pp. 456–457 Objective(s): To add integers with unlike signs. **14-10 Subtract Integers**—pp. 458–459 Objective(s): To subtract integers. **14-11 Multiply Integers**—pp. 460–461 Objective(s): To multiply integers. **14-12 Divide Integers**—pp. 462–463 Objective(s): To divide integers.

Measurement and Data

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Convert like measurement units within a given measurement system.		
5.MD.A.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.	**11-1 Relate Customary Units of Length**—pp. 358–359 Objective(s): To estimate and measure, using customary units of length, to the nearest inch, 1/2 inch, 1/4 inch, and 1/8 inch. To rename customary units of length. **11-2 Relate Customary Units of Capacity**—pp. 360–361 Objective(s): To rename and compare customary units of capacity. **11-3 Relate Customary Units of Weight**—pp. 362–363 Objective(s): To estimate, measure, rename, and compare customary units of weight. **11-7 Compute with Customary Units**—pp. 370–371 Objective(s): To add or subtract customary units of measure and units of time. **12-1 Metric Measurement**—pp. 382–383 Objective(s): To review the standard metric units—meter (m), liter (L), and gram (g)—and the measuring tools associated with each. To rename metric units. **12-2 Relate Metric Units of Length**—pp. 384–385 Objective(s): To relate and choose appropriate metric units of length. To measure to the nearest millimeter, centimeter, and decimeter. **12-3 Relate Metric Units of Capacity**—pp. 386–387 Objective(s): To relate and choose appropriate metric units of capacity. To rename and compare metric units of capacity. **12-4 Relate Metric Units of Mass**—pp. 388–389 Objective(s): To relate and choose appropriate metric units of mass. To rename and compare metric units of mass.
Represent and interpret data.		
5.MD.B.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. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	**7-7 Line Plots**—pp. 250–251 Objective(s): To explore making and using line plots to organize and interpret data. ***12-12A Line Plots**—Online Objective(s): To make a line plot to display a data set of measurements. To solve data problems involving information from line plots.
Geometric measurement: understand concepts of volume.		
5.MD.C.3	• Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	
5.MD.C.3a	• 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.	**12-10 Cubic Measure**—pp. 400–401 Objective(s): To find the cubic measure (volume) of a solid figure by counting cubic units. **12-11 Volume**—pp. 402–403 Objective(s): To find the volume of a rectangular prism using a formula.

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Measurement and Data

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		12-12 Estimate Volume—pp. 404–405 Objective(s): To explore and estimate what volume cube-shaped container is needed to hold objects of various sizes.
5.MD.C.3b	• 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.	**12-10 Cubic Measure**—pp. 400–401 Objective(s): To find the cubic measure (volume) of a solid figure by counting cubic units. **12-11 Volume**—pp. 402–403 Objective(s): To find the volume of a rectangular prism using a formula. **12-12 Estimate Volume**—pp. 404–405 Objective(s): To explore and estimate what volume cube-shaped container is needed to hold objects of various sizes.
5.MD.C.4	• Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft and other real world units.	**12-10 Cubic Measure**—pp. 400–401 Objective(s): To find the cubic measure (volume) of a solid figure by counting cubic units. **12-11 Volume**—pp. 402–403 Objective(s): To find the volume of a rectangular prism using a formula. **12-12 Estimate Volume**—pp. 404–405 Objective(s): To explore and estimate what volume cube-shaped container is needed to hold objects of various sizes.
5.MD.C.5	• Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	
5.MD.C.5a	• 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, 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.	**12-10 Cubic Measure**—pp. 400–401 Objective(s): To find the cubic measure (volume) of a solid figure by counting cubic units. **12-11 Volume**—pp. 402–403 Objective(s): To find the volume of a rectangular prism using a formula. ***12-11A Find Volume**—Online Objective(s): To find the volume of a right rectangular prism in terms of the height and area of the base. ***12-11B Separate Solid Figures**—Online Objective(s): To separate solid figures into known shapes to find volume. **12-12 Estimate Volume**—pp. 404–405 Objective(s): To explore and estimate what volume cube-shaped container is needed to hold objects of various sizes.
5.MD.C.5b	• Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	**12-11 Volume**—pp. 402–403 Objective(s): To find the volume of a rectangular prism using a formula. ***12-11A Find Volume**—Online Objective(s): To find the volume of a right rectangular prism in terms of the height and area of the base.
5.MD.C.5c	• Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	***12-11B Separate Solid Figures**—Online Objective(s): To separate solid figures into known shapes to find volume. To recognize volume as additive.
5.MD.C.6	• Apply the formula for surface area of a rectangular prism. $2ab + 2bc + 2ac$	**12-9 Surface Area**—pp. 398–399 Objective(s): To find the surface area of cubes and rectangular prisms.

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Measurement and Data

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Find Areas of Geometric Shapes Using Formulas		
5.MD.D.7	• Represent relationships between areas of rectangles, triangles, and parallelograms using models.	**12-5 Square Measure**—pp. 390–391 Objective(s): To find the area of a plane figure by counting square units. To use a grid to estimate the area of a plane figure. ***12-5A Find Areas of Rectangles and Squares**—Online Objective(s): To find the area of a rectangle with fractional dimensions by tiling with unit squares of the appropriate unit fraction side lengths. **12-6 Areas of Rectangles and Squares**—pp. 392–393 Objective(s): To use formulas to find the areas of rectangles and squares. **12-7 Areas of Parallelograms and Triangles**—pp. 394–395 Objective(s): To explore finding the area of a parallelogram using its related rectangle and the area of a triangle using its related parallelogram.
5.MD.D.8	• Understand and know how to use the area formula of a triangle; $A = 1/2\ bh$, and represent using models and manipulatives.	**12-7 Areas of Parallelograms and Triangles**—pp. 394–395 Objective(s): To explore finding the area of a parallelogram using its related rectangle and the area of a triangle using its related parallelogram.
5.MD.D.9	• Understand and know how to use the area formula for a parallelogram: $A = bh$ and represent using models and manipulatives.	**12-7 Areas of Parallelograms and Triangles**—pp. 394–395 Objective(s): To explore finding the area of a parallelogram using its related rectangle and the area of a triangle using its related parallelogram.
5.M	• Understand and know how to use the circumference and area formula of a circle.	**10-9 Circumference**—pp. 340–341 Objective(s): To explore finding the area of a parallelogram using its related rectangle and the area of a triangle using its related parallelogram. *Area of a circle is introduced in Grade 6: Lesson 13-13 Area of a Circle—pp. 472–473

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Geometry

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Graph points on the coordinate plane to solve real-world and mathematical problems.		
5.G.A.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).	**14-13 The Coordinate Plane**—pp. 464–465 Objective(s): To locate and graph points on a coordinate grid.
5.G.A.2	• Represent real world and mathematical problems by graphing points in a quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	***14-13A Using Coordinate Graphs**—Online Objective(s): To use the coordinate plane to solve real-world problems. **14-15 Functions and Coordinate Graphs**—pp. 468–469 Objective(s): To graph a function on a coordinate grid.
Classify two-dimensional figures into categories based on their properties.		
5.G.B.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.*	**10-5 Triangles**—pp. 332–333 Objective(s): To understand that attributes belonging to a category of figures also belong to its subcategories. To classify two-dimensional figures into a hierarchy based on properties. ***10-6A Classify Quadrilaterals**—Online Objective(s): To understand that attributes belonging to a category of figures also belong to its subcategories. To classify two-dimensional figures into a hierarchy based on properties.
5.G.B.4	• Classify two-dimensional figures in a hierarchy based on properties.	***10-6A Classify Quadrilaterals**—Online Objective(s): To understand that attributes belonging to a category of figures also belong to its subcategories. To classify two-dimensional figures into a hierarchy based on properties.
Know the Meaning of Angles, and Solve Problems		
5.G.C.5	• Proficiently associate and angle with a certain amount of turning; know that angles are measured in degrees; understand that 90°, 180°, 270°, and 360° are associated respectively, with ¼, ½, and ¾, and full turns.	**10-11 Transformations** (rotations)—pp. 344–345 Objective(s): To explore translations, reflections, and rotations of figures.
5.G.C.6	• Proficiently measure angles with a protractor and classify them as acute, right, obtuse, or straight.	**10-1 Measure and Draw Angles**—pp. 324–325 Objective(s): To name angles and identify their parts. To use a protractor to measure and draw angles. **10-2 Identify Angles**—pp. 326–327 Objective(s): To classify angles by their measures.

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Geometry

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5.G.C.7	• Proficiently identify and name angles on a straight line and vertical angles.	**10-2 Identify Angles**—pp. 326–327 Objective(s): To classify angles by their measures. *Vertical angles introduced in Grade 6: 10-3 Angle Pairs—pp. 334–335
5.G.C.8	• Proficiently find unknown angles in problems involving angles on a straight line, angles surrounding a point, and vertical angles.	**10-2 Identify Angles**—pp. 326–327 Objective(s): To classify angles by their measures. *Vertical angles introduced in Grade 6: 10-3 Angle Pairs—pp. 334–335
5.G.C.9	• Know that angles on a straight line add up to 180° and angles surrounding a point add up to 360°; justify informally by "surrounding" a point with angles.	**10-2 Identify Angles**—pp. 326–327 Objective(s): To classify angles by their measures.
5.G.C.10	• Understand why the sum of the interior angles of a triangle is 180° and the sum of the interior angles of a quadrilateral is 360°, and use these properties to solve problems.	**10-5 Triangles** (Angles of a Triangle)—pp. 332–333 Objective(s): To understand that attributes belonging to a category of figures also belong to its subcategories. To classify two-dimensional figures into a hierarchy based on properties. **10-6 Quadrilaterals** (Angles of a Quadrilateral)—pp. 334–335 Objective(s): To classify quadrilaterals and identify diagonals of polygons. To understand that the sum of the angles of a quadrilateral is 360º.
5.G.C.11	• Find unknown angles and sides using the properties of: triangles, including right, isosceles, and equilateral triangles; parallelograms, including rectangles and rhombuses; and trapezoids.	**10-5 Triangles** (find unknown angles)—pp. 332–333 Objective(s): To understand that attributes belonging to a category of figures also belong to its subcategories. To classify two-dimensional figures into a hierarchy based on properties. **10-6 Quadrilaterals** (find unknown angles)—pp. 334–335 Objective(s): To classify quadrilaterals and identify diagonals of polygons. To understand that the sum of the angles of a quadrilateral is 360º.

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Data and Probability

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Construct and Interpret Line Graphs		
5.DP.A.1	• Read and interpret line graphs, bar graphs, pie charts and pictograms. Solve problems based on graph information.	**7-4 Collect and Organize Data**—pp. 244–245 Objective(s): To organize and represent data in frequency tables. To find cumulative frequency. **7-6 Graphing Sense**—pp. 248–249 Objective(s): To interpret various types of graphs and to review the contexts for which each type is best suited. **7-8 Histograms**—pp. 252–253 Objective(s): To read, interpret, and make histograms. **7-9 Make Line Graphs**—pp. 254–255 Objective(s): To make and interpret line graphs. **7-10 Interpret Circle Graphs**—pp. 256–257 Objective(s): To interpret circle graphs. To interpret a budget. **7-12 Problem Solving Applications: Mixed Review**—pp. 260–261 **Ch. 7 Enrichment: Double Line and Double Bar Graphs**—p. 263 ***12-12A Line Plots**—Online Objective(s): To make a line plot to display a data set of measurements. To solve data problems involving information from line plots.
5.DP.A.2	• Construct graphs from tables of data; include axis labels and scale	**Skills Update: Make Pictographs**—p. 18 **Skills Update: Make Bar Graphs**—p. 19 **7-7 Line Plots**—pp. 250–251 Objective(s): To explore making and using line plots to organize and interpret data. **7-8 Histograms**—pp. 252–253 Objective(s): To read, interpret, and make histograms. **7-9 Make Line Graphs**—pp. 254–255 Objective(s): To make and interpret line graphs. ***12-12A Line Plots**—Online Objective(s): To make a line plot to display a data set of measurements. To solve data problems involving information from line plots.
Find and Interpret Mean and Mode for a Given Set of Data		
5.DP.B.3	• Given a set of data, find and interpret the mean, median, mode, and range.	**7-5 Range, Median, Mean and Mode**—pp. 246–247 Objective(s): To find the range, median, mean, and mode of a set of data.
5.DP.B.4	• Solve word problems involving mean, median, mode, and range.	**7-5 Range, Median, Mean and Mode**—pp. 246–247 Objective(s): To find the range, median, mean, and mode of a set of data.
5.DP.B.5	• Understand the concept of an outlier and explain how that may affect a given set of data.	**7-9 Make Line Graphs** (outliers)—pp. 254–255 Objective(s): To make and interpret line graphs.

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