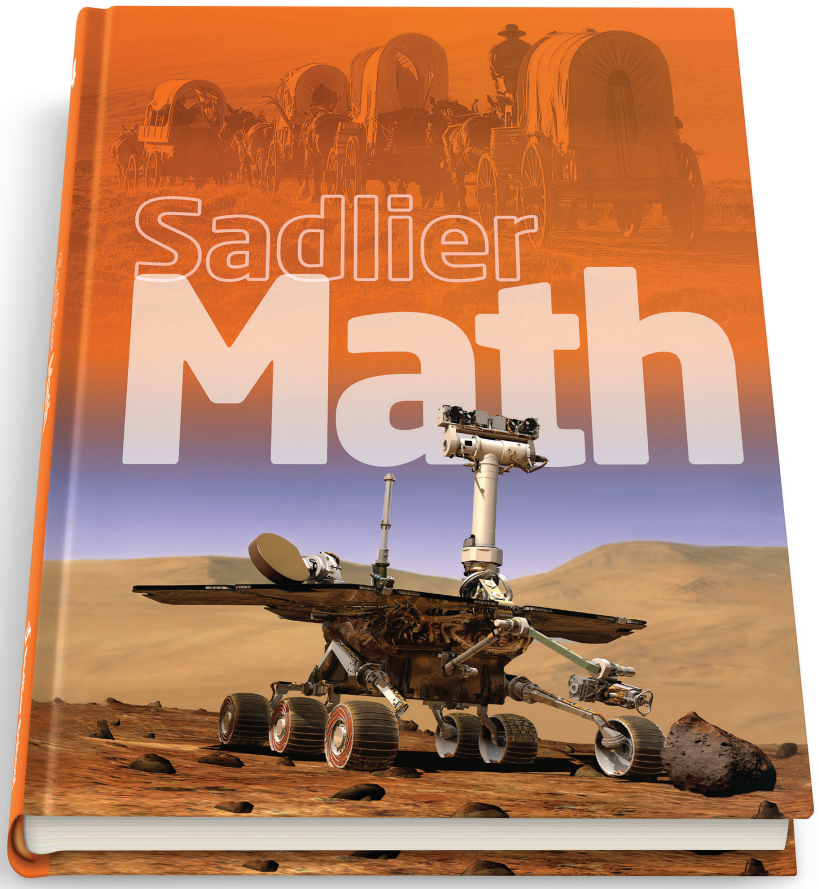
Sadlier Math™

Correlation to the Archdiocese of Hartford Mathematics Standards-based Curriculum

Grade 4



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NUMBER THEORY, OPERATIONS, ALGEBRAIC THINKING (NOA)

Grade 4 Standards	*Sadlier Math*, Grade 4
NOA 4.1 Use place value understanding and properties of operations to perform multi-digit arithmetic. • To represent numbers as groups of millions, thousands, hundreds, tens, and ones in the base ten number system (NOA 4.1) ○ Use place value models, diagrams, number patterns and number lines to identify, order, round, and compare whole numbers to 100,000,000 ○ Identify and name place values to the hundred millions place ○ Use ten as a repeated factor to define place value through hundred millions ○ Use mental math to multiply by 10, 100, and 1000 ○ Build place value models, draw diagrams and show equivalent representations for numbers to 999,999,999 in expanded and regrouped form ○ Read, write, count, skip count, order, compare, and expand numerals to 999,999,999 ○ Write expanded numerals in standard form ○ Identify and name place values to the hundred billions place ○ Read and write number words to one billion ○ Round numbers to the nearest thousand, ten thousand, hundred thousand	**Chapter 1: 1-1 through 1-6** • 1-1 Thousands—pp. 2–3 • 1-2 What Is One Million?—pp. 4–5 • 1-3 Millions—pp. 6–7 • 1-4 Expanded Form—pp. 8–9 • 1-5 Round Whole Numbers—pp. 12–13 • 1-6 Compare and Order Whole Numbers—pp. 14–15 **Chapter 4: 4-1 through 4-3** • 4-1 Multiplication Properties—pp. 68–69 • 4-2 Use Place-Value Models—pp. 70–71 • 4-3 Multiply Tens, Hundreds, and Thousands—pp. 74–75
• To use place value concepts, number patterns, and number properties to develop estimation and computation strategies (NOA 4.1) ○ Use calculators to explore and create number patterns ○ Explore and describe multiplication fact patterns ○ Describe and write the rule for number, color, rhythmic and symbolic patterns ○ Identify and use the inverse relationships of multiplication and division to solve and check problems ○ Solve practical problems and extend patterns involving 10 and 100 more and less than a number ○ Recognize and identify prime and composite numbers to 100 ○ Extend and compare arithmetic and geometric sequences *continued*	**Chapter 1: 1-5** • 1-5 Round Whole Numbers—pp. 12–13 **Chapter 2: 2-3** • 2-3 Estimate Sums—pp. 28–29 **Chapter 3: 3-1** • 3-1 Estimate Differences—pp. 46–47 **Chapter 4: 4-3 & 4-4** • 4-3 Multiply Tens, Hundreds, and Thousands—pp. 74–75 (patterns) • 4-4 Estimate Products—pp. 76–77 **Chapter 6: 6-5** • 6-5 Multiplication Patterns—pp. 118–119 **Chapter 7: 7-1 through 7-3, 7-5** • 7-1 Division Rules—pp. 128–129 • 7-2 Relate Multiplication and Division—pp. 130–131 • 7-3 Estimate Quotients—pp. 132–133 • 7-5 Number Patterns—pp. 138–139 **Chapter 9: 9-3** • 9-3 Prime and Composite Numbers—pp. 176–177

NUMBER THEORY, OPERATIONS, ALGEBRAIC THINKING (NOA)

Grade 4 Standards	*Sadlier Math*, Grade 4
○ Make generalizations about patterns and relationships and test those generalizations ○ Multiply to find special products with multipliers that are multiples of 10, 100, 1000	
• To use factors to explore, represent and classify numbers (NOA 4.1)	**Chapter 9: 9-1 through 9-5** • 9-1 Factors—pp. 172–173 • 9-2 Factor Pairs—pp. 174–175 • 9-3 Prime and Composite Numbers—pp. 176–177 • 9-4 Multiples—pp. 180–181 • 9-5 Common Multiples—pp. 182–183
• To use number patterns, basic facts, arrays, and place value models to multiply and divide whole numbers (NOA 4.1) ○ Multiply four-digit numbers by a one-digit multiplier, two and three digit numbers by a two-digit multiplier ○ Multiply a whole number of up to four digits by a one-digit whole number of operations. ○ Multiply two two-digit numbers, using strategies based on place value and the properties ○ Multiply two and three digit numbers by a one digit number with regrouping ○ 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 ○ Apply problem solving skills in multi-step word problems, using the four operations ○ Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. ○ Fluently calculate and apply multiplication facts and related division facts through 12 x 12. ○ Apply basic math facts to real world applications/ problems ○ Add and subtract 6 digit numbers with and without regrouping ○ Use a calculator to add and subtract large numbers ○ Use front-end estimation ○ Choose and justify the correct operation in a word problem (+,-) ○ Identify, express and apply the zero property of multiplication	**Chapter 2: 2-1 through 2-7** • 2-1 Mathematical Expressions—pp. 24–25 • 2-2 Addition Properties—pp. 26–27 • 2-3 Estimate Sums—pp. 28–29 • 2-4 Add Thousands—pp. 30–31 • 2-5 Add Millions—pp. 34–35 • 2-6 Three or More Addends—pp. 36–37 • 2-7 Problem Solving: Make an Organized List—pp. 38–39 **Chapter 3: 3-1 through 3-7** • 3-1 Estimate Differences—pp. 46–47 • 3-2 Subtract with One Regrouping—pp. 48–49 • 3-3 Subtract with Two Regroupings—pp. 50–51 • 3-4 Subtract Greater Numbers—pp. 54–55 • 3-5 Zeros in Subtraction—pp. 56–57 • 3-6 Multistep Problems Using Addition and Subtraction—pp. 58–59 • 3-7 Problem Solving: Use a Model—pp. 60–61 **Chapter 4: 4-1 through 4-6** • 4-1 Multiplication Properties—pp. 68–69 • 4-2 Use Place-Value Models—pp. 70–71 • 4-3 Multiply Tens, Hundreds, and Thousands—pp. 74–75 • 4-4 Estimate Products—pp. 76–77 • 4-5 Multiply to Compare Numbers—pp. 78–79 • 4-6 Problem Solving: Represent the Situation—pp. 80–81 **Chapter 5: 5-1 through 5-6** • 5-1 Multiply with Regrouping—pp. 88–89 • 5-2 Use Properties to Multiply by One-Digit Numbers—pp. 90–91 • 5-3 Use Area Models to Multiply by One-Digit Numbers—pp. 92–93 • 5-4 Multiply Three- and Four-Digit Numbers—pp. 96–97 • 5-5 Multiplicative and Additive Comparisons—pp. 98–99 • 5-6 Problem Solving: Guess and Test—pp. 100–101 **Chapter 6: 6-1 through 6-6** • 6-1 Use Area Models to Multiply by Two-Digit Numbers—pp. 108–109 • 6-2 Break Apart Numbers to Multiply—pp. 110–111 • 6-3 Multiply by Two-Digit Numbers: No Regrouping—pp. 114–115 • 6-4 Multiply by Two-Digit Numbers: Regrouping—pp. 116–117 • 6-5 Multiplication Patterns—pp. 118–119 • 6-6 Problem Solving: Write and Solve an Equation—pp. 120–121

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NUMBER THEORY, OPERATIONS, ALGEBRAIC THINKING (NOA)

Grade 4 Standards	*Sadlier Math*, Grade 4
○ Describe the property of zero in multiplication and its implication in division ○ Identify, express and apply the commutative, and associative properties of whole numbers in addition and multiplication to estimate, compute, and solve problems ○ Demonstrate equivalence with the commutative and associative properties of whole numbers ○ Demonstrate equivalence with the distributive property of whole numbers ○ Determine the proper operation to solve a problem and justify the reasoning ○ Divide three-digit dividends by multiples of 10 ○ Divide three-digit dividends by a one-digit divisor to find quotients of two or three places with zeros and remainders ○ Memorize and apply divisibility rules for 2,5, 10 ○ Record division using an algorithm (long division) ○ Divide multiples of 10, 100,1000 and 10,000 by multiples of 10 ○ Identify and use the inverse relationships of multiplication and division to solve and check problems ○ Model and interpret division with remainders ○ Calculate quotients with and without remainders for 2-, 3-, and 4- digit dividends and 1-digit divisors, based on place value, the properties of operations, and/or the relationship between multiplication and division ○ Use arrays and explore using the distributive property [10 x (4+5) = (10 x 5) + (10 x 4)] to estimate, multiply and divide two and three digit numbers by one-digit factors ○ Recognize and apply the distributive property of multiplication ○ Use compatible numbers to make reasonable estimates ○ Estimate products and quotients and describe the method of estimation ○ Describe and use estimation strategies that can identify a reasonable answer to a problem when an estimate is appropriate ○ Use clustering to estimate sums ○ Determine and discuss the reasonableness of an answer and explain why a particular estimation strategy will result in an over or underestimate ○ Write and solve multi-step word problems involving estimation *continued*	**Chapter 7: 7-1 through 7-6** • 7-1 Division Rules—pp. 128–129 • 7-2 Relate Multiplication and Division—pp. 130–131 • 7-3 Estimate Quotients—pp. 132–133 • 7-4 Use Models to Divide—pp. 136–137 • 7-5 Number Patterns—pp. 138–139 • 7-6 Problem Solving: Work Backward—pp. 140–141 **Chapter 8: 8-1 through 8-8** • 8-1 One-Digit Quotients—pp. 148–149 • 8-2 Divisibility—pp. 150–151 • 8-3 Two-Digit Quotients—pp. 152–153 • 8-4 Zeros in Quotients—pp. 154–155 • 8-5 More Quotients—pp. 158–159 • 8-6 Order of Operations—pp. 160–161 • 8-7 Multistep Problems Using Multiplication and Division—pp. 162–163 • 8-8 Problem Solving: Use a Model—pp. 164–165 See also Grade 5 **Chapter 4: 4-1 through 4-8** • 4-1 Division Patterns—pp. 68–69 • 4-2 Estimation: Compatible Numbers—pp. 70–71 • 4-3 Divide by One-Digit Numbers—pp. 72–73 • 4-4 Zeros in the Quotient—pp. 74–75 • 4-5 Divisibility and Mental Math—pp. 76–77 • 4-6 Use Arrays and Area Models to Divide—pp. 80–81 • 4-7 Use Strategies to Divide—pp. 82–83 • 4-8 Divide by Two-Digit Numbers—pp. 84–85

NUMBER THEORY, OPERATIONS, ALGEBRAIC THINKING (NOA)

Grade 4 Standards	*Sadlier Math*, Grade 4
○ Divide four-digit dividends by a one digit divisor to find three and four digit quotients with zeros and remainders ○ Divide two- and three-digit dividends by two-digit divisors to find one digit quotients with and without remainders	
• To express monetary values in oral and written forms (M 4.1) • To recognize, identify and trade sets of equivalent coins (M 4.1)	See Grade 2 **Chapter 12: 12-1 through 12-7** • 12-1 Pennies, Nickels, and Dimes—pp. 497–500 • 12-2 Quarters—pp. 501–504 • 12-3 Equal Amounts—pp. 505–508 • 12-4 Compare Money—pp. 509–512 • 12-5 Make Change—pp. 513–516 • 12-6 Add and Subtract Money—pp. 517–520 • 12-7 One Dollar—pp. 521–524
NOA 4.2 Understand meanings of the 4 operations and how they relate to one another to solve problems • To add and subtract whole numbers written in vertical and horizontal form, choosing appropriately between paper and pencil methods and calculators (NOA 4.2) • To identify whole number properties and apply them to whole number operations and algorithms (NOA 4.2)	**Chapter 2: 2-2 through 2-7** • 2-2 Addition Properties—pp. 26–27 • 2-3 Estimate Sums—pp. 28–29 • 2-4 Add Thousands—pp. 30–31 • 2-5 Add Millions—pp. 34–35 • 2-6 Three or More Addends—pp. 36–37 • 2-7 Problem Solving: Make an Organized List—pp. 38–39 **Chapter 3: 3-1 through 3-7** • 3-1 Estimate Differences—pp. 46–47 • 3-2 Subtract with One Regrouping—pp. 48–49 • 3-3 Subtract with Two Regroupings—pp. 50–51 • 3-4 Subtract Greater Numbers—pp. 54–55 • 3-5 Zeros in Subtraction—pp. 56–57 • 3-6 Multistep Problems Using Addition and Subtraction—pp. 58–59 • 3-7 Problem Solving: Use a Model—pp. 60–61 **Chapter 4: 4-1 through 4-5** • 4-1 Multiplication Properties—pp. 68–69 • 4-2 Use Place-Value Models—pp. 70–71 • 4-3 Multiply Tens, Hundreds, and Thousands—pp. 74–75 • 4-4 Estimate Products—pp. 76–77 • 4-5 Multiply to Compare Numbers—pp. 78–79 **Chapter 5: 5-1 through 5-6** • 5-1 Multiply with Regrouping—pp. 88–89 • 5-2 Use Properties to Multiply by One-Digit Numbers—pp. 90–91 • 5-3 Use Area Models to Multiply by One-Digit Numbers—pp. 92–93 • 5-4 Multiply Three- and Four-Digit Numbers—pp. 96–97 • 5-5 Multiplicative and Additive Comparisons—pp. 98–99 • 5-6 Problem Solving: Guess and Test—pp. 100–101 **Chapter 6: 6-1 through 6-6** • 6-1 Use Area Models to Multiply by Two-Digit Numbers—pp. 108–109 • 6-2 Break Apart Numbers to Multiply—pp. 110–111 • 6-3 Multiply by Two-Digit Numbers: No Regrouping—pp. 114–115 • 6-4 Multiply by Two-Digit Numbers: Regrouping—pp. 116–117 *continued*

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Grade 4 Standards	*Sadlier Math*, Grade 4
	• 6-5 Multiplication Patterns—pp. 118–119 • 6-6 Problem Solving: Write and Solve an Equation—pp. 120–121 **Chapter 7: 7-1 through 7-6** • 7-1 Division Rules—pp. 128–129 • 7-2 Relate Multiplication and Division—pp. 130–131 • 7-3 Estimate Quotients—pp. 132–133 • 7-4 Use Models to Divide—pp. 136–137 • 7-5 Number Patterns—pp. 138–139 • 7-6 Problem Solving: Work Backward—pp. 140–141 **Chapter 8: 8-1 through 8-8** • 8-1 One-Digit Quotients—pp. 148–149 • 8-2 Divisibility—pp. 150–151 • 8-3 Two-Digit Quotients—pp. 152–153 • 8-4 Zeros in Quotients—pp. 154–155 • 8-5 More Quotients—pp. 158–159 • 8-6 Order of Operations—pp. 160–161 • 8-7 Multistep Problems Using Multiplication and Division—pp. 162–163 • 8-8 Problem Solving: Use a Model—pp. 164–165
NOA 4.3 Use numbers and their properties to compute fluently and to estimate measures and quantities reasonably • To represent and order number concepts in verbal and written form (NOA 4.3) • To use number patterns, basic facts, arrays, and place value models to multiply and divide whole numbers (NOA 4.3) • To use place value concepts, number patterns, and number properties to develop estimation and computation strategies (NOA 4.3)	**Chapter 2: 2-1 through 2-7** • 2-1 Mathematical Expressions—pp. 24–25 • 2-2 Addition Properties—pp. 26–27 • 2-3 Estimate Sums—pp. 28–29 • 2-4 Add Thousands—pp. 30–31 • 2-5 Add Millions—pp. 34–35 • 2-6 Three or More Addends—pp. 36–37 • 2-7 Problem Solving: Make an Organized List—pp. 38–39 **Chapter 3: 3-1 through 3-7** • 3-1 Estimate Differences—pp. 46–47 • 3-2 Subtract with One Regrouping—pp. 48–49 • 3-3 Subtract with Two Regroupings—pp. 50–51 • 3-4 Subtract Greater Numbers—pp. 54–55 • 3-5 Zeros in Subtraction—pp. 56–57 • 3-6 Multistep Problems Using Addition and Subtraction—pp. 58–59 • 3-7 Problem Solving: Use a Model—pp. 60–61 **Chapter 4: 4-1 through 4-6** • 4-1 Multiplication Properties—pp. 68–69 • 4-2 Use Place-Value Models—pp. 70–71 • 4-3 Multiply Tens, Hundreds, and Thousands—pp. 74–75 • 4-4 Estimate Products—pp. 76–77 • 4-5 Multiply to Compare Numbers—pp. 78–79 • 4-6 Problem Solving: Represent the Situation—pp. 80–81 **Chapter 5: 5-1 through 5-6** • 5-1 Multiply with Regrouping—pp. 88–89 • 5-2 Use Properties to Multiply by One-Digit Numbers—pp. 90–91 • 5-3 Use Area Models to Multiply by One-Digit Numbers—pp. 92–93 • 5-4 Multiply Three- and Four-Digit Numbers—pp. 96–97 • 5-5 Multiplicative and Additive Comparisons—pp. 98–99 • 5-6 Problem Solving: Guess and Test—pp. 100–101 *continued*

NUMBER THEORY, OPERATIONS, ALGEBRAIC THINKING (NOA)

Grade 4 Standards	*Sadlier Math*, Grade 4
	Chapter 6: 6-1 through 6-6 • 6-1 Use Area Models to Multiply by Two-Digit Numbers—pp. 108–109 • 6-2 Break Apart Numbers to Multiply—pp. 110–111 • 6-3 Multiply by Two-Digit Numbers: No Regrouping—pp. 114–115 • 6-4 Multiply by Two-Digit Numbers: Regrouping—pp. 116–117 • 6-5 Multiplication Patterns—pp. 118–119 • 6-6 Problem Solving: Write and Solve an Equation—pp. 120–121 **Chapter 7: 7-1 through 7-6** • 7-1 Division Rules—pp. 128–129 • 7-2 Relate Multiplication and Division—pp. 130–131 • 7-3 Estimate Quotients—pp. 132–133 • 7-4 Use Models to Divide—pp. 136–137 • 7-5 Number Patterns—pp. 138–139 • 7-6 Problem Solving: Work Backward—pp. 140–141 **Chapter 8: 8-1 through 8-8** • 8-1 One-Digit Quotients—pp. 148–149 • 8-2 Divisibility—pp. 150–151 • 8-3 Two-Digit Quotients—pp. 152–153 • 8-4 Zeros in Quotients—pp. 154–155 • 8-5 More Quotients—pp. 158–159 • 8-6 Order of Operations—pp. 160–161 • 8-7 Multistep Problems Using Multiplication and Division—pp. 162–163 • 8-8 Problem Solving: Use a Model—pp. 164–165
NOA 4.4 Understand, describe, and apply patterns and functional relationships to real world situations • To recognize, create and extend numerical and geometric patterns, using concrete materials, number lines, symbols, tables and words (NOA 4.4)	**Chapter 1: 1-7** • 1-7 Problem Solving: Make a Table—pp. 16–17 **Chapter 4: 4-3** • 4-3 Multiply Tens, Hundreds, and Thousands—pp. 74–75 **Chapter 6: 6-5** • 6-5 Multiplication Patterns—pp. 118–119 **Chapter 7: 7-5** • 7-5 Number Patterns—pp. 138–139 (input/output tables) **Chapter 10: 10-2** • 10-2 Equivalent Fractions: Number Line Diagrams—pp. 194–195 **Chapter 11: 11-4** • 11-4 Use Models to Subtract Fractions—pp. 230–231 (number line) **Chapter 13: 13-8** • 13-8 Problem Solving: Find a Pattern—pp. 288–289 **Chapter 15: 15-1** • 15-1 Represent Measures on a Number Line—pp. 324–325 **Chapter 14: 14-10** • 14-10 Problem Solving: Make a Table—pp. 316–317

NUMBER THEORY, OPERATIONS, ALGEBRAIC THINKING (NOA)

Grade 4 Standards	*Sadlier Math*, Grade 4
NOA 4.5 Gain familiarity with factors and multiples • To use factors to explore, represent and classify numbers (NOA 4.5) ○ Identify the Least Common Multiple (LCM) given pairs of numbers less than or equal to 10 ○ Identify the Greatest Common Factor (GCF) given pairs of numbers up to 81 ○ Apply the concepts of Greatest Common Factor and Least Common Multiple to fractions ○ Use the Least Common Multiple to identify the lowest common denominator of a set of fractions ○ Use order of operations to evaluate arithmetic expressions with parentheses ○ Draw factor trees ○ Use exponents to the power of 2	**Chapter 8: 8-6** • 8-6 Order of Operations—pp. 160–161 **Chapter 9: 9-1 through 9-5** • 9-1 Factors—pp. 172–173 • 9-2 Factor Pairs—pp. 174–175 • 9-3 Prime and Composite Numbers—pp. 176–177 • 9-4 Multiples—pp. 180–181 • 9-5 Common Multiples—pp. 182–183 See also Grade 5 **Chapter 1: 1-3** • 1-3 Powers of 10—pp. 8–9
NOA 4.6 Use algebraic symbols to determine equivalence and solve problems • To recognize and demonstrate equivalence using number properties (NOA 4.6) • To write equations to express relationships between numbers (NOA 4.6) ○ Use equations to describe the rules for number patterns ○ Use equations to model word problems • To recognize, use and simplify arithmetic and algebraic expressions (NOA 4.6)	**Chapter 2: 2-1** • 2-1 Mathematical Expressions—pp. 24–25 **Chapter 3: 3-6** • 3-6 Multistep Problems Using Addition and Subtraction—pp. 58–59 **Chapter 4: 4-5** • 4-5 Multiply to Compare Numbers—pp. 78–79 **Chapter 6: 6-6** • 6-6 Problem Solving: Write and Solve an Equation—pp. 120–121 **Chapter 10: 10-2 through 10-4** • 10-2 Equivalent Fractions: Number Line Diagrams—pp. 194–195 • 10-3 Write Equivalent Fractions: Use Models—pp. 196–197 • 10-4 Write Equivalent Fractions: Use Multiplication and Division—pp. 198–199 **Chapter 13: 13-1** • 13-1 Equivalent Fractions: Rename Tenths as Hundredths—pp. 272–273
NOA 4.7 Extend understanding of fraction equivalence and ordering. • To model, identify, compare fractions, and express them in equivalent forms (NOA 4.7) ○ Read, write and identify all fractions ○ Identify and model fractional parts of a set ○ Find fractional parts of numbered groups ○ Use division to find a fractional part of a set ○ Identify and find the simplest form of a fraction *continued*	**Chapter 10: 10-1 through 10-11** • 10-1 Fractions of a Set—pp. 192–193 • 10-2 Equivalent Fractions: Number Line Diagrams—pp. 194–195 • 10-3 Write Equivalent Fractions: Use Models—pp. 196–197 • 10-4 Write Equivalent Fractions: Use Multiplication and Division—pp. 198–199 • 10-5 Fractions: Lowest Terms—pp. 200–201 • 10-6 Compare Fractions: Use Benchmarks—pp. 204–205 • 10-7 Compare Fractions with the Same Denominator—pp. 206–207 • 10-8 Compare Fractions—pp. 208–209 • 10-9 Mixed Numbers—pp. 210–211 • 10-10 Compare Mixed Numbers—pp. 212–213 • 10-11 Order Fractions and Mixed Numbers—pp. 214–215

NUMBER THEORY, OPERATIONS, ALGEBRAIC THINKING (NOA)

Grade 4 Standards	*Sadlier Math*, Grade 4
○ Use models to change an improper fraction to a mixed number ○ Locate and place fractions on a number line • To extend understanding of fraction equivalence and ordering (NOA 4.7) ○ 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. ○ Recognize that comparisons are valid only when the two fractions refer to the same whole ○ Recognize and convert improper fractions and mixed numbers ○ Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation	
• To represent numerical relationships on a coordinate grid (NOA 4.7)	See Grade 5 **Chapter 17: 17-3 & 17-4** • 17-3 The Coordinate Plane—pp. 386–387 • 17-4 Using Coordinate Graphs—pp. 388–389
NOA 4.8 Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. • To compute with fractions (NOA 4.8) ○ Add and subtract like fractions ○ Solve problems involving addition and subtraction of fractions with like denominators • To apply and extend previous understandings of multiplication to multiply a fraction by a whole number (NOA 4.8) ○ Understand a fraction a/b as a multiple of 1/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. ○ 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.	**Chapter 11: 11-1 through 11-8** • 11-1 Use Models to Add Fractions—pp. 224–225 • 11-2 Add Fractions: Like Denominators—pp. 226–227 • 11-3 Decompose Fractions as Sums of Unit Fractions—pp. 228–229 • 11-4 Use Models to Subtract Fractions—pp. 230–231 • 11-5 Subtract Fractions: Like Denominators—pp. 232–233 • 11-6 Write Mixed Numbers as Equivalent Fractions—pp. 236–237 • 11-7 Add Mixed Numbers: Like Denominators—pp. 238–239 • 11-8 Subtract Mixed Numbers: Like Denominators—pp. 240–241 **Chapter 12: 12-1 through 12-6** • 12-1 Add Unit Fractions to Multiply—pp. 250–251 • 12-2 Model Multiplying a Unit Fraction and a Whole Number—pp. 252–253 • 12-3 Multiply a Unit Fraction and a Whole Number—pp. 254–255 • 12-4 Model Multiplying a Fraction and a Whole Number—pp. 258–259 • 12-5 Multiply a Fraction and a Whole Number—pp. 260–261 • 12-6 Represent Situations Involving Multiplying a Fraction and a Whole Number—pp. 262–263

NUMBER THEORY, OPERATIONS, ALGEBRAIC THINKING (NOA)

Grade 4 Standards	*Sadlier Math*, Grade 4
NOA 4.9 Understand decimal notation for fractions, and compare decimal fractions. • To extend whole number place value patterns, models, and notations to include decimals (NOA 4.9) • To extend place value concepts and number properties to addition and subtraction of decimal numbers (NOA 4.9) ○ Model, read and write decimals in tenths and hundredths ○ Locate decimals on a number line ○ Count by tenths and hundredths ○ Annex zeroes to create equivalent decimal numbers ○ Write decimal numbers to express fractions with denominators of 10 and 100 ○ Relate decimals in tenths to fractions, and mixed numbers ○ Compare and order decimals of tenths and hundredths (use symbols <, >, =, and ≠) ○ Relate money (pennies and dimes) to decimals ○ Round decimal numbers to the nearest tenth and whole number ○ Round decimal numbers to the nearest hundredth ○ Estimate decimal sums and differences using rounding ○ Construct and use models and pictures to add and subtract decimals ○ Add and subtract decimals to hundredths ○ Model, read and write decimals to thousandths place in standard form and as number words	**Chapter 13: 13-1 through 13-8** • 13-1 Equivalent Fractions: Rename Tenths as Hundredths—pp. 272–273 • 13-2 Add and Subtract Fractions with Denominators of 10 and 100—pp. 274–275 • 13-3 Tenths and Hundredths as Fractions and Decimals—pp. 276–277 • 13-4 Decimals Greater than One—pp. 278–279 • 13-5 Decimal Place Value—pp. 280–281 • 13-6 Compare Decimals with Models and Symbols—pp. 284–285 • 13-7 Order Decimals—pp. 286–287 • 13-8 Problem Solving: Find a Pattern—pp. 288–289 See Grade 5 **Chapter 10: 10-1 through 10-7** • 10-1 Use Models to Add Decimals—pp. 220–221 • 10-2 Use Properties to Add Decimals—pp. 222–223 • 10-3 Estimate Decimal Sums—pp. 224–225 • 10-4 Problem Solving: Draw a Picture—pp. 228–229 • 10-5 Add Decimals: Hundredths—pp. 230–231 • 10-6 Add Decimals: Thousandths—pp. 232–233 • 10-7 Addition with Money—pp. 234–235 **Chapter 11: 11-1 through 11-6** • 11-1 Use Models to Subtract Decimals—pp. 242–243 • 11-2 Estimate Decimal Differences—pp. 244–245 • 11-3 Subtract Decimals: Hundredths—pp. 248–249 • 11-4 Subtract Decimals: Thousandths—pp. 250–251 • 11-5 Subtraction with Money—pp. 252–253 • 11-6 Problem Solving: Use a Model—pp. 254–255
• Students understand various mathematical procedures and use them appropriately and accurately (NOA 4.9) ○ illustrate and explain a calculation by using equations, rectangular arrays, and/or area models ○ apply problem solving skills in multi-step word problems including problems in which remainders must be interpreted, using the four operations	**Chapter 1: 1-7** • 1-7 Problem Solving: Make a Table—pp. 16–17 **Chapter 2: 2-7** • 2-7 Problem Solving: Make an Organized List—pp. 38–39 **Chapter 3: 3-7** • 3-7 Problem Solving: Use a Model—pp. 60–61 **Chapter 4: 4-6** • 4-6 Problem Solving: Represent the Situation—pp. 80–81 **Chapter 5: 5-6** • 5-6 Problem Solving: Guess and Test—pp. 100–101 *continued*

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Grade 4 Standards	*Sadlier Math*, Grade 4
	Chapter 6: 6-6 • 6-6 Problem Solving: Write and Solve an Equation—pp. 120–121 **Chapter 7: 7-6** • 7-6 Problem Solving: Work Backward—pp. 140–141 **Chapter 8: 8-8** • 8-8 Problem Solving: Use a Model—pp. 164–165 **Chapter 9: 9-6** • 9-6 Problem Solving: Four-Step Process—pp. 184–185 **Chapter 10: 10-12** • 10-12 Problem Solving: Four-Step Process—pp. 216–217 **Chapter 11: 11-9** • 11-9 Problem Solving: Compare Strategies—pp. 242–243 **Chapter 12: 12-7** • 12-7 Problem Solving: Choose a Strategy—pp. 264–265 **Chapter 13: 13-8** • 13-8 Problem Solving: Find a Pattern—pp. 288–289 **Chapter 14: 14-10** • 14-10 Problem Solving: Make a Table—pp. 316–317 **Chapter 15: 15-9** • 15-9 Problem Solving: Use Logical Reasoning—pp. 342–343 **Chapter 16: 16-6** • 16-6 Problem Solving: Use a Diagram—pp. 362–363 **Chapter 17: 17-8** • 17-8 Problem Solving: Draw a Picture—pp. 386–387

MEASUREMENT (M)

Grade 4 Standards	*Sadlier Math*, Grade 4
M 4.1 Develop and apply appropriate techniques, tools and formulas to estimate and determine measurements • To express monetary values in oral and written forms (M 4.1) • To recognize, identify and trade sets of equivalent coins (M 4.1) • To determine and use various tools and units to estimate and measure (M 4.1) ○ Choose an appropriate unit to estimate length or distance *continued*	**Chapter 14: 14-1 through 14-10** • 14-1 Measure with Inches—pp. 296–297 • 14-2 Customary Units of Length—pp. 298–299 • 14-3 Customary Units of Capacity—pp. 300–301 • 14-4 Customary Units of Weight—pp. 302–303 • 14-5 Operations with Customary Units—pp. 304–305 • 14-6 Metric Units of Length—pp. 308–311 • 14-7 Metric Units of Capacity—pp. 310–313 • 14-8 Metric Units of Mass—pp. 312–313 • 14-9 Operations with Metric Units—pp. 314–315 • 14-10 Problem Solving: Make a Table—pp. 316–317 See Grade 2 **Chapter 12: 12-1 & 12-4** • 12-1 Pennies, Nickels, and Dimes—pp. 497–500 • 12-2 Quarters—pp. 501–504 *continued*

MEASUREMENT (M)

Grade 4 Standards	*Sadlier Math*, Grade 4
○ Estimate, draw, and measure length and height to the nearest inch, half inch, quarter inch and centimeter ○ Solve practical problems that involve estimation and measurement of length, perimeter, and area ○ Solve practical problems that involve estimation and measurement of volume and capacity ○ Identify the conversions for feet, yards and miles ○ Estimate and measure length and height in millimeters, decimeters, kilometers ○ Identify place value in decimal numbers and write decimals in expanded form. (EX. 61.34 = 60 + 1 + 0.3 + 0.04) ○ Use models and pictures to estimate reasonable answers when adding or subtracting decimals, fractions, and mixed numbers ○ Write and solve multi-step word problems with fractions, including problems with extraneous information	• 12-3 Equal Amounts—pp. 505–508 • 12-4 Compare Money—pp. 509–512 • 12-5 Make Change—pp. 513–516 • 12-6 Add and Subtract Money—pp. 517–520 • 12-7 One Dollar—pp. 521–524
○ Model and demonstrate ratios through the use of concrete objects and pictures using ratios ○ Describe the relationship between decimals, fractions and percent ○ Use models, pictures, and number patterns to solve simple problems involving ratio and proportions	See Grade 6 **Chapter 10: 10-1 through 10-9** • 10-1 Ratios—pp. 226–227 • 10-2 Tables of Equivalent Ratios—pp. 228–229 • 10-3 Tape Diagrams—pp. 230–231 • 10-4 Double Number Lines—pp. 232–233 • 10-5 Compare Ratios—pp. 236–237 • 10-6 Rates and Unit Rates—pp. 238–239 • 10-7 Compare Prices—pp. 240–241 • 10-8 Equations for Proportional Relationships—pp. 242–243 • 10-9 Graphs of Proportional Relationships—pp. 244–245 **Chapter 11: 11-2 through 11-4** • 11-2 Relate Percents to Fractions—pp. 256–257 • 11-3 Relate Percents to Decimals—pp. 258–259 • 11-4 Relate Decimals, Fractions, and Percents—pp. 260–261
• To solve problems involving money (M 4.2) • To determine and compare coin values (M 4.2) ○ Add amounts of money less than a dollar to sums greater than a dollar ○ Subtract amounts of money; Apply to real world situations ○ Apply and explain a variety of estimation strategies in problem- solving situations to add and subtract money amounts less than ○ $10.00 and two- and three-digit numbers with and without regrouping *continued*	See Grade 2 **Chapter 12: 12-1 through 12-7** • 12-1 Pennies, Nickels, and Dimes—pp. 497–500 • 12-2 Quarters—pp. 501–504 • 12-3 Equal Amounts—pp. 505–508 • 12-4 Compare Money—pp. 509–512 • 12-5 Make Change—pp. 513–516 • 12-6 Add and Subtract Money—pp. 517–520 • 12-7 One Dollar—pp. 521–524 See Grade 5 **Chapter 10: 10-7** • 10-7 Addition with Money—pp. 234–235 *continued*

MEASUREMENT (M)

Grade 4 Standards	*Sadlier Math*, Grade 4
○ Add and subtract sums of money in columns aligning decimal points; ○ Round amounts of money to the nearest dollar	**Chapter 11: 11-5** • 11-5 Subtraction with Money—pp. 252–253 **Chapter 12: 12-5** • 12-5 Multiplication with Money—pp. 270–271 **Chapter 13: 13-4 & 13-7** • 13-4 Estimate with Money—pp. 294–295 • 13-7 Division with Money—pp. 302–303
• To use standard units and identify and express examples of measurement in daily life (M 4.2) • To use measurement to determine and explain relative size of a given objects and measures (M 4.2) ○ Define, identify, and use cup, pint, quart, gallon, liter, milliliter and apply to real life ○ Define, identify, use and relate benchmarks to ounce and gram and relate use in real life ○ Solve practical problems that involve estimation and measurement of weight ○ Compare and order objects according to weight ○ Identify conversion factors in the metric system ○ Identify and use kilogram and ton	**Chapter 14: 14-1 through 14-10** • 14-1 Measure with Inches—pp. 296–297 • 14-2 Customary Units of Length—pp. 298–299 • 14-3 Customary Units of Capacity—pp. 300–301 • 14-4 Customary Units of Weight—pp. 302–303 • 14-5 Operations with Customary Units—pp. 304–305 • 14-6 Metric Units of Length—pp. 308–311 • 14-7 Metric Units of Capacity—pp. 310–313 • 14-8 Metric Units of Mass—pp. 312–313 • 14-9 Operations with Metric Units—pp. 314–315 • 14-10 Problem Solving: Make a Table—pp. 316–317

GEOMETRY (G)

Grade 4 Standards	*Sadlier Math*, Grade 4
G 4.1 Analyze characteristics and properties of two and three dimensional geometric shapes and develop mathematical arguments about relationships and communicate rationale • To describe geometric properties of plane and solid figures (G 4.1) ○ Analyze two-dimensional shapes and determine lines of symmetry and congruence ○ Identify, describe and classify triangles according to sides and angles ○ Identify, describe, classify and draw polygons: quadrilaterals, pentagons, hexagons, octagons *continued*	**Chapter 17: 17-1 through 17-5, 17-8** • 17-1 Polygons—pp. 370–371 • 17-2 Quadrilaterals—pp. 372–373 • 17-3 Triangles—pp. 374–375 • 17-4 Symmetry—pp. 376–377 • 17-5 Shape Patterns—pp. 380–381 • 17-8 Problem Solving: Draw a Picture—pp. 386–387 See also Grade 5 **Chapter 16: 16-1** • 16-1 Solid Figures—pp. 360–361

GEOMETRY (G)

Grade 4 Standards	*Sadlier Math*, Grade 4
• To identify and generalize relationships between measurable attributes of plane and solid figures (G 4.1) ○ Build, draw, create, describe, and classify two- and three-dimensional figures ○ Sort polygons and solids by using characteristics such as the relationship of sides (parallel, perpendicular), kinds of angles (right, acute, obtuse), symmetry, and congruence ○ Describe similarities and differences of two and three dimensional shapes in the environment using physical features such as number of sides, number of angles, lengths of sides and straight and curved parts ○ Describe solid figures using faces, edges, and vertices	
○ Compute perimeter of a polygon using the formula ○ Find the area of squares and rectangles ○ Develop and apply the formula for finding area of squares and rectangles ○ Describe relationships between the lengths of sides of rectangles and their areas and perimeters; generalize the patterns as simple formulas ○ Find the volume of rectangular prisms by modeling and counting cubic units ○ Find strategies for estimating and measuring the perimeters and areas of irregular shapes ○ Identify and find the radius and diameter of a circle ○ Identify and estimate the circumference of a circle	**Chapter 17: 17-6 & 17-7** • 17-6 Use Perimeter Formulas—pp. 382–383 • 17-7 Use Area Formulas—pp. 384–385 See also Grade 3 **Chapter 15: 15-1 through 15-5** • 15-1 Understand Area—pp. 312–313 • 15-2 Find Area Using Standard Units—pp. 314–315 • 15-3 Find the Area of a Rectangle and a Square—pp. 316–317 • 15-4 Find Area Using the Distributive Property—pp. 320–321 • 15-5 Find Area of Composite Shapes—pp. 322–323 **Chapter 16: 16-1 through 16-6** • 16-1 Understand Perimeter—pp. 332–333 • 16-2 Find Perimeter—pp. 334–335 • 16-3 Find Unknown Side Lengths—pp. 336–337 • 16-4 Problem Solving: Compare Strategies—pp. 340–341 • 16-5 Same Perimeter, Different Areas—pp. 342–343 • 16-6 Same Area, Different Perimeters—pp. 344–345 See also Grade 5 **Chapter 16: 16-2 through 16-5** • 16-2 Cubic Measure—pp. 362–363 • 16-3 Volume of Rectangular Prisms—pp. 364–365 • 16-4 Volume Formulas—pp. 368–369 • 16-5 Volume of Composite Figures—pp. 370–371 See also Grade 6 **Chapter 14: 14-1 through 14-4** • 14-1 Areas of Parallelograms and Rhombuses—pp. 316–317 • 14-2 Areas of Triangles—pp. 318–319 • 14-3 Areas of Trapezoids—pp. 320–321 • 14-4 Circumferences and Areas of Circles—pp. 324–325 **Chapter 15: 15-4 & 15-5** • 15-4 Use Cubes to Find Volumes—pp. 346–347 • 15-5 Volumes of Right Rectangular Prisms—pp. 348–349

GEOMETRY (G)

Grade 4 Standards	*Sadlier Math*, Grade 4
G 4.2 Understand concepts of angle and measure angles.	**Chapter 16: 16-1 through 16-6** • 16-1 Points, Lines, Line Segments, Rays, and Angles—pp. 350–351 • 16-2 Angle Measure—pp. 352–353 • 16-3 Measure Angles—pp. 356–357 • 16-4 Unknown Angle Measures—pp. 358–359 • 16-5 Parallel and Perpendicular Lines—pp. 360–361 • 16-6 Problem Solving: Use a Diagram—pp. 362–363
G 4.3 Specify locations and describe spatial relationships using coordinate geometry and other representational systems • To identify, draw and describe elements needed to explain spatial relationships (G 4.3) ○ Identify and draw points, lines, line segments, and rays ○ Identify, compare and contrast intersecting, perpendicular and parallel lines ○ Classify angles as right, acute or obtuse ○ Identify translations, rotations, and reflections ○ Explain the results of dividing, combining, and transforming shapes and the effects of slides, flips, and turns ○ Identify ways to tile or tessellate a region or shape using various polygons • To use coordinate systems to identify and illustrate spatial location and geometric relationships (G 4.3, 4.4)	See Grade 6 **Chapter 9: 9-7 through 9-10** • 9-7 Plot Points in the Coordinate Plane—pp. 210–211 • 9-8 Reflections of Points—pp. 212–213 • 9-9 Distance on the Coordinate Plane—pp. 214–215 • 9-10 Plot Polygons—pp. 216–217
G 4.4 Apply transformations and use symmetry to analyze mathematical situations • To identify, draw and describe elements needed to explain spatial relationships (G 4.3) • To use coordinate systems to identify and illustrate spatial location and geometric relationships (G 4.3, 4.4)	**Chapter 17: 17-4** • 17-4 Symmetry—pp. 376–377 See also Grade 5 **Chapter 17: 17-3** • 17-3 The Coordinate Plane—pp. 386–387 See also Grade 6 **Chapter 9: 9-7 through 9-10** • 9-7 Plot Points in the Coordinate Plane—pp. 210–211 • 9-8 Reflections of Points—pp. 212–213 • 9-9 Distance on the Coordinate Plane—pp. 214–215 • 9-10 Plot Polygons—pp. 216–217

DATA ANALYSIS, STATISTICS, & PROBABILITY (DSP)

Grade 4 Standards	*Sadlier Math*, Grade 4
DSP.4.1 Select and use appropriate statistical methods to analyze data • To collect, organize and describe data (DSP 4.1) ○ Use a variety of ways to collect, organize, record, analyze, and interpret data and identify patterns and trends ○ Compute the mean of a set of data ○ Use range, mean, median, and mode to explain data; Identify outliers ○ Conduct surveys to gather data ○ Demonstrate and explain survey findings ○ Use technology to create spreadsheets and convert information into graphs ○ Make predictions and defend conclusions based on data ○ Locate points on a coordinate grid (Quadrant I) using ordered pairs ○ Use a table to explore functions and graph them on a coordinate grid (Quadrant I)	**Chapter 15: 15-5 through 15-8** • 15-5 Line Graphs—pp. 334–335 • 15-6 Line Plots—pp. 336–337 • 15-7 Surveys and Line Plots—pp. 338–339 • 15-8 Choose an Appropriate Display—pp. 340–341 See also Grade 5 **Chapter 17: 17-3 through 17-6** • 17-3 The Coordinate Plane—pp. 386–387 • 17-4 Using Coordinate Graphs—pp. 388–389 • 17-5 Write Number Patterns—pp. 390–391 • 17-6 Graph Number Patterns—pp. 392–393
DSP.4.2 Analyze data sets to form hypotheses and make predictions • To describe features of a data set (DSP 4.2) • To pose questions to be answered through collection and analysis of a data set (DSP 4.2) ○ Make predictions and defend conclusions based on data	**Chapter 15: 15-5 through 15-7** • 15-5 Line Graphs—pp. 334–335 • 15-6 Line Plots—pp. 336–337 • 15-7 Surveys and Line Plots—pp. 338–339
DSP.4.3 Understand and apply basic concepts of probability • To determine the likelihood of certain events through games and simple experiments (DSP 4.3) ○ Express probability in verbal and numerical terms ○ Conduct probability experiments and express the probability based on possible outcomes ○ Express probability as a fraction ○ Identify possible outcomes of events using combinations where order does not matter	See Grade 6 **Chapter 18: 18-1 through 18-7** • 18-1 Populations and Samples—online • 18-2 Drawing Conclusions from Samples—online • 18-3 Probability and Likelihood—online • 18-4 Theoretical Probability—online • 18-5 Relative Frequency and Experimental Probability—online • 18-6 Uniform Probability Models—online • 18-7 Non-Uniform Probability Models—online
DSP.4.4 Develop and evaluate inferences and predictions that are based on data	**Chapter 15: 15-5 & 15-7** • 15-5 Line Graphs—pp. 334–335 • 15-7 Surveys and Line Plots—pp. 338–339