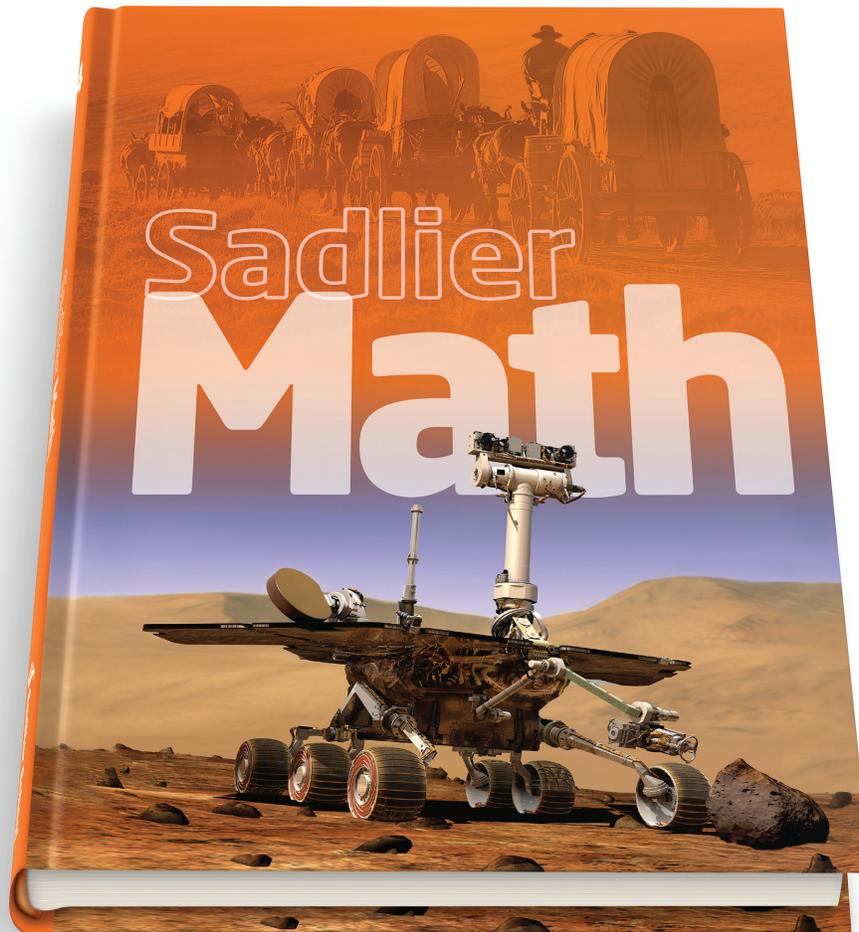


*Sadlier Math*TM

Correlation to the Alabama 2019 Course of Study
Mathematics

Grade 4



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OPERATIONS AND ALGEBRAIC THINKING

Grade 4 Content Standards

Sadlier Math, Grade 4

Use the four operations with whole numbers to solve problems.

1. [4.OA.1.] Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ 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.

Chapter 4: 4-5

- 4-5 Multiply to Compare Numbers—pp. 78-79

Chapter 5: 5-5

- 5-5 Multiplicative and Additive Comparisons—pp. 98-99

2. [4.OA.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.

Chapter 4: 4-5

- 4-5 Multiply to Compare Numbers—pp. 78-79

Chapter 5: 5-5

- 5-5 Multiplicative and Additive Comparisons—pp. 98-99

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

3. [4.OA.3.] Solve multistep 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.

Chapter 2: 2-1 through 2-3

- 2-1 Mathematical Expressions—pp. 24-25
- 2-2 Addition Properties—pp. 26-27
- 2-3 Estimate Sums—pp. 28-29

Chapter 3: 3-1 & 3-6

- 3-1 Estimate Differences—pp. 46-47
- 3-6 Multistep Problems Using Addition and Subtraction—pp. 58-59

Chapter 4: 4-4

- 4-4 Estimate Products—pp. 76-77

Chapter 7: 7-3

- 7-3 Estimate Quotients—pp. 132-133

Chapter 8: 8-1 & 8-3

- 8-1 One-Digit Quotients—pp. 148-149
- 8-3 Two-Digit Quotients—pp. 152-153

Gain familiarity with factors and multiples.

4. [4.OA.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.

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

OPERATIONS AND ALGEBRAIC THINKING

Grade 4 Content Standards

Sadlier Math, Grade 4

Generate and analyze patterns.

- 5. [4.OA.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.

Example: Given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence, and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.

Chapter 6: 6-5

- 6-5 Multiplication Patterns—pp. 118-119

Chapter 7: 7-5

- 7-5 Number Patterns—pp. 138-139

Chapter 17: 17-5

- 17-5 Shape Patterns—pp. 380-381

NUMBER AND OPERATIONS IN BASE TEN

Grade 4 Content Standards

Sadlier Math, Grade 4

Generalize place value understanding for multi-digit whole numbers.

- 6. [4.NBT.1]** Recognize that in a multi-digit whole number, a digit in any place represents ten times what it represents in the place to its right.

Example: Recognize that $700 \div 70 = 10$ by applying concepts of place value and division.

Chapter 1: 1-2 & 1-3

- 1-2 What Is One Million?—pp. 4-5
- 1-3 Millions—pp. 6-7

- 7. [4.NBT.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.

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

- 8. [4.NBT.3]** Use place value understanding to round multi-digit whole numbers to any place.

Chapter 1: 1-5

- 1-5 Round Whole Numbers—pp. 12-13

NUMBER AND OPERATIONS IN BASE TEN

Grade 4 Content Standards

Sadlier Math, Grade 4

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

9. [4.NBT.4] Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Chapter 2: 2-2, 2-4 through 2-6

- 2-2 Addition Properties—pp. 26-27
- 2-4 Add Thousands—pp. 30-31
- 2-5 Add Millions—pp. 34-35
- 2-6 Three or More Addends—pp. 36-37

Chapter 3: 3-2 through 3-5

- 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

10. [4.NBT.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.

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

Chapter 5: 5-1 through 5-5

- 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

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 8: 8-7

- 8-7 Multistep Problems Using Multiplication and Division—pp. 162-163

11. [4.NBT.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.

Chapter 7: 7-1, 7-2 & 7-4

- 7-1 Division Rules—pp. 128-129
- 7-2 Relate Multiplication and Division—pp. 130-131
- 7-4 Use Models to Divide—pp. 136-137

Chapter 8: 8-1 through 8-7

- 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

NUMBER AND OPERATIONS — FRACTIONS

Grade 4 Content Standards

Sadlier Math, Grade 4

Extend understanding of fraction equivalence and ordering.

12. [4.NF.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.

Chapter 10: 10-2 through 10-6

- 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

13. [4.NF.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.

Chapter 10: 10-7 through 10-11

- 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

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

14. [4.NF.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.

Chapter 11: 11-1 through 11-5

- 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

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.

Chapter 11: 11-2 through 11-4

- 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

Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.

NUMBER AND OPERATIONS — FRACTIONS

Grade 4 Content Standards	Sadlier Math, Grade 4
<p>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.</p>	<p>Chapter 10: 10-9</p> <ul style="list-style-type: none"> 10-9 Mixed Numbers—pp. 210–211 <p>Chapter 11: 11-6 through 11-8</p> <ul style="list-style-type: none"> 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
<p>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.</p>	<p>Chapter 11: 11-1 through 11-5</p> <ul style="list-style-type: none"> 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
<p>15. [4.NF.4] Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p>	
<p>a. Understand a fraction a/b as a multiple of $1/b$.</p> <p>Example: Use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.</p>	<p>Chapter 12: 12-1 through 12-4</p> <ul style="list-style-type: none"> 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
<p>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.</p> <p>Example: Use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)</p>	<p>Chapter 12: 12-1 through 12-5</p> <ul style="list-style-type: none"> 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

NUMBER AND OPERATIONS — FRACTIONS

Grade 4 Content Standards	Sadlier Math, Grade 4
<p>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.</p> <p>Example: If each person at a party will eat $\frac{3}{8}$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?</p>	<p>Chapter 12: 12-1 through 12-7</p> <ul style="list-style-type: none"> • 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 • 12-7 Problem Solving: Choose a Strategy—pp. 264-265
<p>Understand decimal notation for fractions, and compare decimal fractions.</p>	
<p>16. [4.NF.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. (Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.).</p> <p>Example: Express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.</p>	<p>Chapter 13: 13-1 through 13-5</p> <ul style="list-style-type: none"> • 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
<p>17. [4.NF.6] Use decimal notation for fractions with denominators 10 or 100.</p> <p>Example: Rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</p>	<p>Chapter 13: 13-3 through 13-5</p> <ul style="list-style-type: none"> • 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

NUMBER AND OPERATIONS — FRACTIONS

Grade 4 Content Standards	<i>Sadlier Math, Grade 4</i>
<p>18. [4.NF.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.</p>	<p>Chapter 13: 13-6 & 13-7</p> <ul style="list-style-type: none"> • 13-6 Compare Decimals with Models and Symbols—pp. 284–285 • 13-7 Order Decimals—pp. 286–287

MEASUREMENT AND DATA

Grade 4 Content Standards	<i>Sadlier Math, Grade 4</i>
<p>Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</p>	
<p>19. [4.MD.1] Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; and 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.</p> <p>Examples: Know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36),</p>	<p>Chapter 14: 14-1 through 14-10</p> <ul style="list-style-type: none"> • 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
<p>20. [4.MD.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.</p>	<p>Chapter 14: 14-1 through 14-9</p> <ul style="list-style-type: none"> • 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 <p>Chapter 15: 15-1 through 15-3</p> <ul style="list-style-type: none"> • 15-1 Represent Measures on a Number Line—pp. 324–325 • 15-2 Use Multiplication to Rename Measures—pp. 326–327 • 15-3 Elapsed Time—pp. 328–329

MEASUREMENT AND DATA

Grade 4 Content Standards

Sadlier Math, Grade 4

21. [4.MD.3] Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

Example: Find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

Chapter 17: 17-6 & 17-7

- 17-6 Use Perimeter Formulas—pp. 382-383
- 17-7 Use Area Formulas—pp. 384-385

Represent and interpret data.

22. [4.MD.4] Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots.

Example: From a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

Chapter 15: 15-6 & 15-7

- 15-6 Line Plots—pp. 336-337
- 15-7 Surveys and Line Plots—pp. 338-339

Geometric measurement: understand concepts of angle and measure angles.

23. [4.MD.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 $\frac{1}{360}$ of a circle is called a “one-degree angle” and can be used to measure angles.

Chapter 16: 16-2

- 16-2 Angle Measure—pp. 352-353

b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.

Chapter 16: 16-1 & 16-2

- 16-1 Points, Lines, Line Segments, Rays, and Angles—pp. 350-351
- 16-2 Angle Measure—pp. 352-353

MEASUREMENT AND DATA

Grade 4 Content Standards	<i>Sadlier Math, Grade 4</i>
<p>24. [4.MD.6] Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</p>	<p>Chapter 16: 16-1 through 16-3</p> <ul style="list-style-type: none"> • 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
<p>25. [4.MD.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 or mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.</p>	<p>Chapter 16: 16-4</p> <ul style="list-style-type: none"> • 16-4 Unknown Angle Measures—pp. 358-359

GEOMETRY

Grade 4 Content Standards	<i>Sadlier Math, Grade 4</i>
<p>Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</p>	
<p>26. [4.G.1] Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.</p>	<p>Chapter 16: 16-1 through 16-6</p> <ul style="list-style-type: none"> • 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
<p>27. [4.G.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.</p>	<p>Chapter 17: 17-1 through 17-3</p> <ul style="list-style-type: none"> • 17-1 Polygons—pp. 370-371 • 17-2 Quadrilaterals—pp. 372-373 • 17-3 Triangles—pp. 374-375
<p>28. [4.G.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.</p>	<p>Chapter 17: 17-4</p> <ul style="list-style-type: none"> • 17-4 Symmetry—pp. 376-377