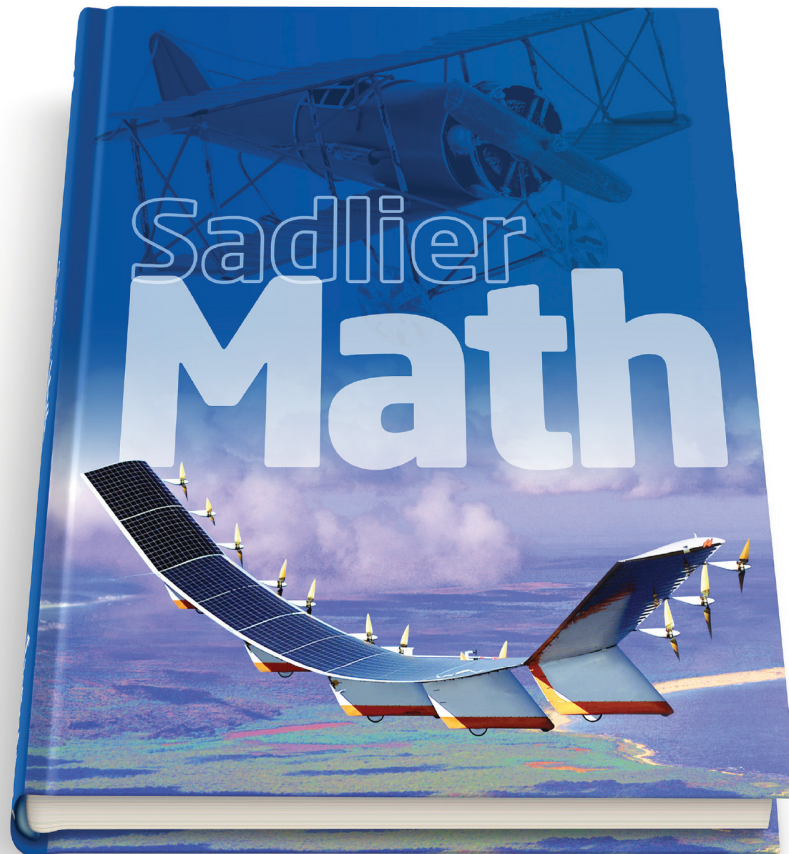# *Sadlier Math*™

Correlation to the South Dakota State Standards for Mathematics

Grade 5

Learn more at www.SadlierSchool.com/SadlierMath

OPERATIONS AND ALGEBRAIC THINKING   5.OA

Grade 5 Content Standards	*Sadlier Math*, Grade 5

A. Write and interpret numerical expressions.

5.OA.1 Use and explain parentheses, in numerical expressions, and evaluate expressions with these symbols.	**Chapter 1 Place Value, Addition and Subtraction** • 1-5 Addition Properties and Subtraction Rules—pp. 12–13 **Chapter 2 Place Value and Decimals** • 2-2 Decimals and Expanded Form—pp. 26–27 **Chapter 3 Multiplication** • 3-1 Multiplication Properties—pp. 44–45 **Chapter 4 Division** • 4-10 Order of Operations—pp. 88–89 • 4-11 Expressions—pp. 90–91 **Chapter 7 Fractions: Subtraction** • 7-2 Subtract Fractions: Unlike Denominators—pp. 144–145 **Chapter 12 Decimals: Multiplication** • 12-7 Multiply Decimals by Decimals—pp. 276–277 • 12-8 Zeros in the Product—pp. 278–279
5.OA.2 Write simple expressions that record calculations with numbers to represent real world problems, 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.)	**Chapter 1 Place Value, Addition and Subtraction** • 1-5 Addition Properties and Subtraction Rules—pp. 12–13 • 1-6 Estimate Sums and Differences—pp. 14–15 • 1-7 Find Sums and Differences—pp. 16–17 **Chapter 3 Multiplication** • 3-2 Multiplication Patterns—pp. 46–47 • 3-3 Estimate Products—pp. 48–49 **Chapter 4 Division** • 4-10 Order of Operations—pp. 88–89 • 4-11 Expressions—pp. 90–91

B. Analyze patterns and relationships.

5.OA.3 Generate two numerical patterns using two given rules. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. Identify the relationship between the two patterns. 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.	**Chapter 17 Graphs and Data** • 17-5 Write Number Patterns—pp. 390–391 • 17-6 Graph Number Patterns—pp. 392–393 • 17-7 Problem Solving: Find and Use a Pattern—pp. 394–395

NUMBER AND OPERATION IN BASE TEN   5.NBT

Grade 5 Content Standards	*Sadlier Math*, Grade 5
A. Understand the place value system	
5.NBT.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.	**Chapter 1 Place Value, Addition and Subtraction** • 1-1 Place Value to Billions—pp. 2–3 • 1-2 Expanded Form—pp. 4–5
5.NBT.2 Explain and apply patterns in the number of zeros of the product when multiplying a number by powers of 10. Explain and apply patterns in the placement of the decimal point with respect to the values of the digits in the product or the quotient, when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	**Chapter 1 Place Value, Addition and Subtraction** • 1-3 Powers of 10—pp. 8–9 **Chapter 12 Decimals: Multiplication** • 12-1 Multiply by Powers of 10—pp. 262–263 **Chapter 13 Decimals: Division** • 13-1 Divide by Powers of 10—pp. 288–289
5.NBT.3 Read, write, and compare decimals to thousandths.	
a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).	**Chapter 2 Place Value and Decimals** • 2-1 Thousandths—pp. 24–25
b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**Chapter 2 Place Value and Decimals** • 2-3 Compare and Order Decimals—pp. 30–31 **Chapter 13 Decimals: Division** • 13-3 Estimate Decimal Quotients—pp. 292–293 • 13-4 Estimate with Money—pp. 294–295 • 13-5 Divide Decimals by Whole Numbers—pp. 296–297
5.NBT.4 Use place value understanding to round decimals to any place.	**Chapter 2 Place Value and Decimals** • 2-4 Round Decimals—pp. 32–33 • 2-6 Estimate with Decimals—pp. 36–37 **Chapter 10 Decimals: Addition** • 10-3 Estimate Decimal Sums—pp. 224–225 **Chapter 11 Decimals: Subtraction** • 11-2 Estimate Decimal Differences—pp. 244–245

NUMBER AND OPERATION IN BASE TEN   5.NBT

Grade 5 Content Standards	*Sadlier Math*, Grade 5

B. Perform operations with multi-digit whole number and with decimals to hundredths.

5.NBT.5 Fluently multiply multi-digit whole numbers using an algorithm, including but not limited to the standard algorithm.	**Chapter 3 Multiplication** • 3-4 Zeros in the Multiplicand—pp. 50–51 • 3-5 Multiply by Two-Digit Numbers—pp. 54–55 • 3-6 Problem Solving: Guess and Test—pp. 56–57 • 3-7 Multiply by Three-Digit Numbers—pp. 58–59 • 3-8 Zeros in the Multiplier—pp. 60–61
5.NBT.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. Explain the calculation by using equations, rectangular arrays, illustrations, area models, or other representations based on place value	**Chapter 4 Division** • 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
5.NBT.7 Use the four operations with 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; justify the reasoning used with a written explanation.	
a. Add and subtract decimals	**Chapter 10 Decimals: Addition** • 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 Decimals: Subtraction** • 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

NUMBER AND OPERATION IN BASE TEN   5.NBT

Grade 5 Content Standards	*Sadlier Math*, Grade 5
b. Multiply and divide decimals.	**Chapter 12 Decimals: Multiplication** • 12-2 Use Properties to Multiply a Decimal by a Whole Number—pp. 264–265 • 12-3 Estimate Decimal Products—pp. 266–267 • 12-4 Multiply Decimals by Whole Numbers—pp. 268–269 • 12-5 Multiplication with Money—pp. 270–271 • 12-6 Model Multiplying Two Decimals—pp. 274–275 • 12-7 Multiply Decimals by Decimals—pp. 276–277 • 12-8 Zeros in the Product—pp. 278–279 • 12-9 Problem Solving: More Than One Way—pp. 280–281 **Chapter 13 Decimals: Division** • 13-1 Divide by Powers of 10—pp. 288–289 • 13-2 Model Dividing a Decimal by a Whole Number—pp. 290–291 • 13-5 Divide Decimals by Whole Numbers—pp. 296–297 • 13-6 Zeros in Decimal Quotients—pp. 298–299 • 13-7 Division with Money—pp. 302–303 • 13-8 Problem Solving: Work Backward—pp. 304–305 • 13-9 Model Dividing a Decimal by a Decimal—pp. 306–307 • 13-10 Divide a Decimal by a Decimal—pp. 308–309

NUMBER AND OPERATIONS—FRACTIONS   5.NF

Grade 5 Content Standards	*Sadlier Math*, Grade 5

A. Use equivalent fractions as a strategy to add and subtract fractions.

Grade 5 Content Standards	*Sadlier Math*, Grade 5
5.NF.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 with a like denominator. It is not necessary at this grade level to simplify the sum or difference. For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)	**Chapter 6 Fractions: Addition** • 6-1 Model Addition with Unlike Denominators—pp. 122–123 • 6-2 Add Fractions: Unlike Denominators—pp. 124–125 • 6-3 Fraction Addition: Estimation and Reasonableness—pp. 126–127 • 6-4 Add Mixed Numbers—pp. 130–131 • 6-6 Rename Mixed Number Sums—pp. 134–135 **Chapter 7 Fractions: Subtraction** • 7-1 Model Subtraction of Fractions with Unlike Denominators—pp. 142–143 • 7-2 Subtract Fractions: Unlike Denominators—pp. 144–145 • 7-4 Model Subtraction with Mixed Numbers—pp. 150–151 • 7-6 Subtract Fractions and Whole Numbers from Mixed Numbers—pp. 154–155 • 7-7 Subtract Mixed Numbers: Rename Fractions—pp. • 7-7 Subtract Mixed Numbers: Rename Fractions—pp. 156–157 • 7-8 Subtract Mixed Numbers: Rename Whole Numbers and Fractions—pp. 158–159

NUMBER AND OPERATIONS—FRACTIONS   5.NF

Grade 5 Content Standards	*Sadlier Math*, Grade 5
5.NF.2 Solve word problems involving addition and subtraction of fractions.	
a. 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.	**Chapter 6 Fractions: Addition** • 6-1 Model Addition with Unlike Denominators—pp. 122–123 • 6-2 Add Fractions: Unlike Denominators—pp. 124–125 • 6-4 Add Mixed Numbers—pp. 130–131 • 6-6 Rename Mixed Number Sums—pp. 134–135 **Chapter 7 Fractions: Subtraction** • 7-1 Model Subtraction of Fractions with Unlike Denominators—pp. 142–143 • 7-2 Subtract Fractions: Unlike Denominators—pp. 144–145 • 7-5 Estimate Sums and Differences of Mixed Numbers—pp. 152–153 • 7-7 Subtract Mixed Numbers: Rename Fractions—pp. 156–157 • 7-8 Subtract Mixed Numbers: Rename Whole Numbers and Fractions—pp. 158–159
b. 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.	**Chapter 6 Fractions: Addition** • 6-3 Fraction Addition: Estimation and Reasonableness—pp. 126–127 **Chapter 7 Fractions: Subtraction** • 7-3 Subtract Fractions: Estimation and Reasonableness—pp. 146–147

B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

5.NF.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?	**Chapter 5 Number Theory and Fractions** • 5-8 Interpret a Remainder—pp. 114–115 **Chapter 8 Fractions: Multiplication** • 8-6 Rename Mixed Numbers as Fractions—pp. 180–181 • 8-7 Estimate Products with Mixed Numbers—pp. 182–183

NUMBER AND OPERATIONS—FRACTIONS | 5.NF

Grade 5 Content Standards	*Sadlier Math*, Grade 5
5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.	
a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)	**Chapter 8 Fractions: Multiplication** • 8-1 Model Multiplying Fractions—pp. 168–169 • 8-2 Multiply Fractions by Fractions—pp. 170–171 • 8-3 Multiply Fractions and Whole Numbers—pp. 172–173 • 8-5 Common Factors in Products—pp. 176–177 • 8-8 Multiply Fractions and Mixed Numbers—pp. 184–185 • 8-9 Multiply Mixed Numbers—pp. 186–187
b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	**Chapter 8 Fractions: Multiplication** • 8-10 Find the Area of a Rectangle—pp. 188–189
5.NF.5 Interpret multiplication as scaling (resizing), by:	
a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	**Chapter 8 Fractions: Multiplication** • 8-4 Scaling Fractions—pp. 174–175
b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	**Chapter 8 Fractions: Multiplication** • 8-4 Scaling Fractions—pp. 174–175

Sadlier School

NUMBER AND OPERATIONS—FRACTIONS   5.NF

Grade 5 Content Standards	*Sadlier Math*, Grade 5
5.NF.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.	**Chapter 8 Fractions: Multiplication** • 8-2 Multiply Fractions by Fractions—pp. 170–171 • 8-3 Multiply Fractions and Whole Numbers—pp. 172–173 **Chapter 9 Fractions: Division** • 9-6 Word Problems Involving Fraction Division—pp. 210–211
5.NF.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.	
a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. 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.	**Chapter 9 Fractions: Division** • 9-5 Divide Fractions by Whole Numbers—pp. 208–209
b. 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.	**Chapter 9 Fractions: Division** • 9-1 Divide Whole Numbers by Unit Fractions—pp. 198–199 • 9-2 Reciprocals—pp. 200–201 • 9-3 Divide Whole Numbers by Fractions—pp. 202–203
c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. 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?	**Chapter 9 Fractions: Division** • 9-5 Divide Fractions by Whole Numbers—pp. 208–209 • 9-6 Word Problems Involving Fraction Division—pp. 210–211

MEASUREMENT AND DATA   5.MD

Grade 5 Content Standards	*Sadlier Math*, Grade 5

A. Convert like measurement units within a given measurement system.

5.MD.1 Convert customary and metric measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m). Use these conversions in solving multi-step, real world problems involving distances, intervals of time, liquid volumes, masses of objects, and money (including problems involving simple fractions or decimals). For example, 3.6 liters and 4.1 liters can be combined as 7.7 liters or 7700 milliliters.	**Chapter 14 Measurement** • 14-1 Relate Customary Units of Length—pp. 316–317 • 14-2 Relate Customary Units of Capacity—pp. 318–319 • 14-3 Relate Customary Units of Weight—pp. 320–321 • 14-4 Compute with Customary Units—pp. 322–323 • 14-5 Relate Metric Units of Length—pp. 326–327 • 14-6 Relate Metric Units of Capacity—pp. 328–329 • 14-7 Relate Metric Units of Mass—pp. 330–331 • 14-8 Compute with Metric Units—pp. 332–333

B. Represent and interpret data.

5.MD.2 Make a line plot to display a data set.	
a. Use operations on fractions of a unit (1/2, 1/4, 1/8) for this grade to solve problems involving information presented in line plots.	**Chapter 17 Graphs and Data** 17-1 Line Plots with Whole Numbers and Decimals—pp. 380–381 17-2 Line Plots with Fractions and Mixed Numbers—pp. 382–383
b. Use information from a line plot representing an unequal situation and redistribute whole or fractional parts to create an equal distribution. 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	**Chapter 17 Graphs and Data** 17-1 Line Plots with Whole Numbers and Decimals—pp. 380–381 17-2 Line Plots with Fractions and Mixed Numbers—pp. 382–383

C. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

5.MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	
a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	**Chapter 16 Volume** • 16-1 Solid Figures—pp. 360–361 • 16-2 Cubic Measure—pp. 362–363 • 16-3 Volumes of Rectangular Prisms—pp. 364–365

MEASUREMENT AND DATA   5.MD

Grade 5 Content Standards	*Sadlier Math*, Grade 5
b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.	**Chapter 16 Volume** • 16-2 Cubic Measure—pp. 362–363 • 16-3 Volumes of Rectangular Prisms—pp. 364–365
5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	**Chapter 16 Volume** • 16-2 Cubic Measure—pp. 362–363 • 16-3 Volumes of Rectangular Prisms—pp. 364–365
5.MD.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	
a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base.	**Chapter 16 Volume** • 16-3 Volumes of Rectangular Prisms—pp. 364–365 • 16-6 Problem Solving: Act It Out—pp. 372–373
b. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.	**Chapter 16 Volume** • 16-3 Volumes of Rectangular Prisms—pp. 364–365 • 16-6 Problem Solving: Act It Out—pp. 372–373
c. Apply the formulas $V = l \times w \times h$ and $V = B \times h$ (where *B* is the area of the base) for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.	**Chapter 16 Volume** • 16-4 Volume Formulas—pp. 368–369
d. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	**Chapter 16 Volume** • 16-5 Volume of Composite Figures—pp. 370–371

Sadlier School

GEOMETRY	5.G

Grade 5 Content Standards	*Sadlier Math*, Grade 5

A. Graph points on the coordinate plane to solve real-world and mathematical problems.

5.G.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).	**Chapter 17 Graphs and Data** • 17-3 The Coordinate Plane—pp. 386–387
5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	**Chapter 17 Graphs and Data** • 17-4 Using Coordinate Graphs—pp. 388–389

B. Classify two-dimensional figures into categories based on their properties.

5.G.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.	**Chapter 15 Geometry** • 15-1 Polygons—pp. 342–343 • 15-2 Triangles—pp. 344–345 • 15-3 Quadrilaterals—pp. 348–349 • 15-4 Classify Quadrilaterals—pp. 350–351 • 15-5 Problem Solving: Use a Model—pp. 352–353
5.G.4 Classify two-dimensional figures in a hierarchy based on properties. For example, all rectangles are parallelograms, because they are all quadrilaterals with two pairs of opposite, parallel, equal-length sides.	**Chapter 15 Geometry** • 15-2 Triangles—pp. 344–345 • 15-4 Classify Quadrilaterals—pp. 350–351 • 15-5 Problem Solving: Use a Model—pp. 352–353